EFFECTIVENESS OF MULTIMEDIA INSTRUCTIONAL MATERIALS IN TEACHING GRADE 6 TECHNOLOGY AND LIVELIHOOD EDUCATION

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Abstract. This study aimed to determine the effectiveness of multimedia instructional materials in the performance of Grade 6 learners in Technology and Livelihood Education-Industrial Arts at Goliman Elementary School during the third quarter of the school year 2019-2020. The control group and experimental group have a comparable performance with a MPS of 36.84% and 35.86% respectively prior to the conduct of the study. After the conduct of the experiment, the experimental group exposed to multimedia instructional material performed better than the control group that was exposed to traditional instructional material. The computed t-value is 12.722 which is higher than the critical value of 2.016 at .05 level of significance with 53 degrees of freedom. The null hypothesis which states that there is no significant difference in the performance of Grade 6 learners of the two groups in the post-test is rejected. Thus, using digitized instructional materials is more effective than using traditional instructional materials in teaching Technology and Livelihood Education–Industrial Arts.

1 Introduction

The inevitable innovations in technology causes a number of opportunities and at the same time, challenges for educational institutions which take into consideration the adaptability of the learners. These opportunities comprise ease of access to innumerable multimedia content, the escalating utilization of e-learning resources, the universal expansion of smart phones and tablets that can connect to the internet anytime, the outspread role of social networks for educational development, and the accelerating interest in the capability of technological tools in the classroom that aids learning among the learners.

The application of multimedia technology is widely used in teaching and learning. Using multimedia in teaching provide the learner chances for interaction in the classroom (Joshi 2012), simulate student's interest, and multimedia-assisted teaching can inspire students' enthusiasm of learning (Nan Guan et. al, 2018). Furthermore, multimedia offers exciting possibilities for meeting the needs of 21st century learners. Incorporating multimedia in teaching reformed teaching method, concepts and teaching materials. It adds vitality to the reformation of teaching method, breaking the traditional mode and broadening the horizon of students, also, it improves the efficiency on the class.

A study made by Liu (2012) found that students prefer multimedia than traditional teaching mode because it is more useful and helpful to them. Barzegar et. al. (2013) also revealed that using the teaching model based on multimedia increased students' performance than traditional teaching methods. In addition, the student's activity, participation, interest and creativity have been increased through using multimedia method of teaching. Multimedia facilitates in the brain's ability to connect between verbal and visual representations of content, leading to a deeper understanding, which in turn supports the transfer of learning to other situations.

Coupled with the implementation of the K to 12 Program, teachers handling Technology and Livelihood Education or TLE are now challenged to create an impact as to whether or not the learners have acquired the concepts and essential skills to become productive citizens of the society. They should, therefore, provide learning activities which could be the training ground to enable the learners to face the battle of real-life situations.

Considering that TLE is a "hands-on" subject, learning is best by doing and student outputs are very significant as proof of learning. As such, TLE teachers should focus on the learners' acquisition of competencies through actual task performance of each learner. Learning task performance is a school work where teachers give information like tools, materials and steps to be followed by the students to become skillful.

The researcher, an elementary TLE teacher, has observed that learners' performance for the last year's show low lack index on the periodical test results with MPS of 65% below mastery level. The teacher also observed that learner's show lack of interest and do not show perseverance in completing their learning tasks in the classroom. However, engaging the learners through interactive ways such as using multimedia attracts their attention and ignites their enthusiasm in the class. Multimedia might be a big help in demonstrating steps in the learning task of the learners in order to attain mastery of the skills based on the performance standards of the curriculum.

2   Review of Related Literature

The researcher presented foreign and local literature and studies related to the present study that provided input in the current study. They also provided significant insights that helped the researcher in the development of multimedia instructional materials.

The study of Xin (2011), Marbas (2016), Ruiz (2006), Blackmore et., al. (2003) and Abdi et., al. (2009) emphasized the utilization of ICT and multimedia in teaching and its positive effect in teaching-learning process. Likewise, Samuel (2009) stated the importance of using the right instructional materials to engage the student in the classroom activities. Moreover, the study of Chen and Ye (2012) and Korakakis (2011) shown the effectiveness and improvement of the learning process using multimedia instruction.

The studies by by Rungduin et. al, (2008), Albarico, et., al. (2017), Ariaso and Tancinco (2016) Ching (2014), and Obero (2018) supports the need of incorporating multimedia in teaching more particularly in Technology and Livelihood Education

3   Research Methodology

3.1   Research Design

This research utilized quasi-experimental that involves a pretest and post-test design. Quasi experimental research design as defined by Maciejewski (2020) involves the manipulation of independent variable to observe the effect on dependent variable.

Specifically, the researcher will make use of two group design to gather information about the performance of the control group (using traditional instructional materials) and experimental group (using multimedia instructional materials) of Grade 6 learners in Technology and Livelihood Education.

3.2   Sources of Data

The study was conducted in the classroom of the Grade 6 at Goliman Elementary School. It is located in Barangay Goliman, Malasiqui, Pangasinan. The subjects of this study were the 55 learners from 2 sections in Grade 6 being handled by the researcher at Goliman Elementary School during the school year 2019-2020. Table 1 show the distribution of Grade 6 respondents. Tossing a coin is used to decide which group will be the control group and experimental group. After tossing the coin, Grade 6 – Masikap was the control group while Grade-6 Mapagmahal was the experimental group.

3.3   Statistical Treatment of Data

To answer sub-problem number 1 and 3, mean and mean percentage scores (MPS) were used to determine the performance of the learners exposed to traditional and multimedia instructional material. The researcher used the prescribed descriptive performance level by the Department of Education according to National Achievement Test (NAT) Standard.

To answer sub-problem number 2 and 4, t-test for non-correlated data using Statistical Package for Social Sciences was used to determine the significant difference between the performance of the learners exposed to traditional and multimedia instructional material.

To answer sub-problem number 5, t-test for correlated data using Statistical Package for Social Sciences (SPSS) was used to determine the significant difference between the performance of the learners exposed to traditional and multimedia instructional material.

4   Presentation, Analysis, and Interpretation of Data

4.1 Performance of the Grade 6 Learners in Technology and Livelihood Education-Industrial Arts

Table 1 reveals the initial performance of both groups of Grade 6 learners, the control and experimental groups, in TLE. It shows that the initial level of performance of the two groups were 36.84 MPS and 35.86 MPS respectively. This implies that learners in both groups had low mastery level of fundamental knowledge and understanding of the competencies in industrial arts prior to the conduct of the experimental study.

Table 1. Initial Level of Performance of the Two Groups of Grade 6
Learners as Revealed on the Pretest Result

Group	Mean	MPS
Control Group	18.42	36.84
Experimental Group	17.93	35.86

The results indicate that students and teachers alike must engage in a collaborative process to discover the potential of existing technological tools in light of learning, teaching, and communication. Incorporating technology might enriched and redefined learning environment (Ching, 2014).

4.2 Test of Significant Difference in the Performance of the Control and Experimental Group in the Pretest

Table 2. Test of Significant Difference in the Performance of the Control and
Experimental Group in the Pretest Experimental Group in the Pretest

N=55

Group	Mean	Mean Difference	Computed t-value	Significance	Decision
Control Group	18.42	.49	.739	Not Significant	Accept Ho
Experimental Group	17.93				

Critical t value at .05 = 2.006, df=53

It could be seen from Table 2 that the learners registered their mean difference of .49. This would mean that there is a fair distribution in heterogenous groupings of Grade 6 leaners in Goliman Elementary School as evident on the mean difference. It could be gleaned from the same table that the control group obtained a mean of 18.42 demonstrated a higher mean than the experimental group with a mean score of 17.93. It discloses that the initial performance in Technology and Livelihood Education–Industrial Arts of control group is not significantly different with from the performance of the experimental group, t critical (2.006) is higher than the computed t–value (.739).

This finding warrants the researcher to accept the null hypothesis, thus, there is no significant difference between the initial performance of both groups in TLE Industrial Arts as revealed by the pretest results. This implies that both groups have the same level of initial performance prior to the experiment proper.

4.3 Performance of Grade 6 Learners in Technology and Livelihood Education in the Post Test

Table 4 shows the post-test performance of Grade 6 learners in TLE Industrial Arts. It reveals that the group exposed to using multimedia instructional material has an MPS of 85.17 which is describe as "mastered" while the group exposed using the traditional instructional material has an MPS of 63.30 described as "moving towards mastery". The increase of MPS of the group exposed to multimedia instructional material implies that they performed better than the other group. Hence, multimedia integration facilitates well in the learning process of the group exposed to it. This would entail that using multimedia instructional material could be a potential tool as teaching approach to be used in enhancing learner's performance in TLE Industrial Arts. The results confirmed the study of Blackmore et., al. (2003) that ICT or the use of

multimedia in learning increase students' motivation, help students to solve problem, and increases students' attention span.

Table 3. Post-Test Results of the Control and Experimental Group in TLE Industrial Arts 6

Group	Mean	MPS
Control Group	31.65	63.30
Experimental Group	42.59	85.17

4.4 Test of Significance of the Difference in the Post-test Performance of the Control and Experimental Group

Table 4 reveals that the post-test performance in TLE Industrial Arts of the group exposed to using multimedia instructional material (Experimental Group) is significantly higher than the group who use the traditional instructional material (Control Group) with the computed t-value 12.722 which is higher than the t critical 2.016. This finding warrants the researcher to reject the null hypothesis at .05 level of significance. Thus, there is a significant difference between the performances in industrial arts of the two groups. The learners of the group who were exposed in multimedia instructional material in teaching TLE Industrial Arts performed better than those who were exposed in traditional instructional material. This implies that using multimedia instructional material in teaching TLE industrial arts is effective. The Rungduin et. al, (2008) validates the result of this study that students become more attentive whenever multimedia presentations are used and allows student to become empowered on how they learn their lessons.

Table 4. Test of Significance of the Difference in the Performance of the Control
and Experimental Groups in the Post Test
N=55

Group	Mean	Mean Difference	Computed t-value	Significance	Decision
Control Group	31.65				
Experimental Group	42.59	10.94	12.722	Significant	Reject Ho

Critical t value at .05 = 2.016, df=53

4.5 Significant Difference in the Performance of the Control Group in the Pre-Test and Post-Test

Table 5 shows a mean difference of 13.23 in the pretest and post-test of the group exposed using traditional instructional material. Evidently, there was an increased in their post-test level of performance.

Table 5. Test of Significant Difference in the Performance of the Control Group
in the Pretest and Post-Test
N=26

Control	Mean	Mean Difference	Computed t-value	Significance	Decision
Pretest	18.42	13.23	23.719	Significant	Reject Ho
Post-test	31.65				

Critical t value at .05 = 2.059, df=25

Table 5 reveals that computed t-value is higher that the t critical 2.059, hence, the results warrant the researcher to reject the null hypothesis. The post-test performance of the group exposed to traditional instructional material has improved as compared to their pretest performance. attained moving towards mastery level only as shown in Table 4. This implies that using traditional instructional material is effective but may not be highly effective in enhancing the learners' performance in TLE Industrial Arts.

Table 6 reveals that the post-test performance in TLE Industrial Arts of the group exposed to multimedia instructional material is significantly higher than their pretest performance with the computed t-value = 49.123 compared to the t critical = 2.048. The null hypothesis is hereby rejected at .05 level of significance.

Table 6. Test of Significance of the Difference in the Pretest and Post-test
Performance of the Group Exposed to Multimedia Instructional Material

N=29

Experimental Group	Mean	Mean Difference	Computed t-value	Significance	Decision
Pretest	17.93	24.66	49.123	Significant	Reject Ho
Post-test	42.59				

Critical t value at .05 = 2.048, df=28

Hence, there is a significant difference in the pretest and post-test performance of the experimental group. It can be inferred, therefore, that the high level of performance (Mastered) of the group could be due to their exposure to the various video and PowerPoint presentations during their learning activities inside the classroom. Thus, multimedia instructional material in teaching TLE Industrial Arts is very effective.

5   Conclusion and Recommendation

Based on their pretest results, Grade 6 learners have difficulties in understanding the fundamental knowledge in TLE Industrial Arts. Prior to the utilization of multimedia instructional material in teaching Industrial Arts, the two groups of learners have comparable level of performance. Learners find it easier to understand the competencies in TLE Industrial Arts when taught using multimedia instructional material. Learners taught by using multimedia instructional material perform better in TLE Industrial Arts than those taught using the traditional instructional material. Utilization of multimedia instructional material in teaching is effective in enhancing learner's performance in TLE Industrial Arts.

Multimedia instructional material should be used in teaching Technology and Livelihood Education-Industrial Arts among Grade 6 learners. School administrators should encourage teachers to utilize new strategies of teaching that fit the interest of Grade 6 learners especially in Technology and Livelihood Education. Teachers should use multimedia instructional materials to improve the level of performance of their learners. Further studies should be conducted to include other factors that affect the level of performance among learners. Similar studies should be conducted to focus on other variables not covered by this study and other areas of Technology and Livelihood Education

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