

VIDEO-AIDED SELF-REFLECTION A PEDAGOGICAL TOOL IN TEACHING BIOLOGY

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ABSTRACT

Advancement and evolution of different kinds of gadgets, mobile phones, laptops and computers are highly appreciated by most of the students today. These become effective tools to enhance their motivation and active engagement inside the classroom. However, these also change the continuity of lesson because students confine themselves in using gadgets and playing mobile games at home. Decline in students' performance becomes visible. In educational system where technology cannot be withdrawn, an intensive effort of a teacher to integrate it constructively can revamp technology as an effective tool for learning. With this explosive space of change and development, the researcher decided to check out the effectiveness of video as a tool for learning in a form of video-aided self-reflection in teaching Biology. The study used quasi-experimental research design. The participants of this study were 100 Grade 8 students from two different sections handled by the researcher in the School Year 2018-2019. A researcher-made pre-test was steered out to the controlled group and experimental group at the beginning of the fourth quarter. Controlled group used traditional means of self-reflection while the experimental group used video-aided self-reflection. At the end of the quarter the same test was administered to both controlled and experimental group. Mean, standard deviation and t-test were used as statistical tools to navigate the results of the study. Findings revealed that both groups showed differences in their score implying that they had different level of performance in Biology after the utilization of video-aided self-reflection. This revealed that the use of video-aided self-reflection was an effective pedagogical tool in teaching Biology.

Keywords: Video-aided, Self-Reflection, Pedagogical Tool, quasi-experimental, Philippines

INTRODUCTION

The present worldwide scenarios and happenings required intensive application of science education. A systematic quest of experimentation is highly required in generating knowledge. It has invaded every branch of modern life and it answers the why, what, where and when that anyone could possibly ask. It gives better understanding of human existence. The ease to cope with the challenges of everyday life is brought by science. Communication, transportation and other means in order to

survive were made possible because of this. Today's modern world would be unimaginable without its continuing progress in science. K to 12 education aims to develop scientific literacy among learners that will prepare them to be informed and become participative citizens who are able to make judgments and decisions regarding applications of scientific knowledge that may have social, health, or environmental impacts. It recognizes the place of science and technology in everyday human affairs. It integrates science and technology in the social, economic, personal and ethical aspects of life



(Department of Education, 2016). Biology as one of the core subjects in K to 12 curriculum provides answers to large-scale concerns that may affect anyone from different parts of the world. Biology education they acquire in school would be of value to the totality of their education. This paves way for humans to conduct scientific investigations which are useful in discovering things. It pursues in getting strong evidence on how life came to be. This helps people know the uniqueness of some creations. Often students find Biology as a boring subject. Students find it hard to understand and relate themselves to different topics in this subject. Inappropriate motivation techniques lead to student's low performance in the subject. Students often considered this as difficult subject that they fail to give much effort to understand every topic. In connection to this, proper motivation techniques must be utilized to make the subject fun and interesting. To make effective motivation, integration of technology in learning takes greater part. DepEd Order No. 42 s. 2016 Policy Guidelines in Preparation of Daily Lesson Plan support teachers in managing classes effectively to ensure the achievement of learning. The guidelines are committed to learners' success allowing the use of varied strategies to meet the needs of diverse learners. This empowers teachers to carry out quality instruction which allows information and communication technologies (ICTs) and different instructional materials to develop learning across the curriculum (DO 42, S. 2016). To support learning of 21st century learners especially with those with special needs, technology offers tremendous promise. Technology-mediated activities can be a solution to the pressing challenges of the biology teaching and learning process. The presence of cell phones presents both opportunities and challenges for today's students. Gadgets and other multimedia direct their attention to what is important and creates motivation for learning that will help them see the interconnectedness of learning experiences. According to Shukla (2015), technology provides students a chance to learn new things in the most convenient and engaged setting. The power it creates molded students to become more

independent and responsible in their learning. Fashionable methods of learning using different software, computer-based tools and applications enable student to present their creativity to communicate with others. Effective use of technology in teaching and learning process help students to develop a wide range of their communication and social skills. In a constructivist classroom where students learn by doing, technology was found to be very effective means to create an output in a trendier way. Presenting their ideas using computers, expressing themselves through video applications, creating visual output using graphic windows, uploading their files in social media have great impact on the learning process. Making reflection of what the students learn in school serves as extension activities which would help them to recall the lesson of the day. This can be in a form of review, recall and written forms like daily journal and diaries. Students who are deeply immersed with technology can also make videos to reflect on what they have learned to support their learning. Student-created reflective videos help them to communicate creatively. Students acknowledge that the use of video design a more creative verbal communication for them. The richer information they can create developed a very good transition from what they have learned and to their real life. The exposure to the real-life situation and relating themselves into immersed them into the reality. Explaining in their own way makes their learning meaningful and real Smith (2016). Furthermore, recording videos in making self-reflection allows the students to see themselves as independent learners. They can choose the learning environment which can inspire them in making self-reflection. Their reflection provides evidence that even outside the school they can still recall what they have learned in the classroom. Therefore, it can be considered as an effective style in developing critical thinking and processing ideas comprehensively through videos (Scott, et al., 2013). With the recent advances of technology at homes and in schools and the development of personal devices such as tablets or smartphones, it is very significant that this has great impact in changing the learning

environment. This explosive space of change and development, the researcher came out to use the video as a tool to enhance learning and motivation. Realizing the increasing impact of technology on vitalizing classroom instruction, the researcher decided to investigate the effectiveness of the video-aided self-reflection in teaching Biology.

OBJECTIVES OF THE STUDY

Generally, this study aimed to determine the effectiveness of video-aided self-reflection as a pedagogical tool in teaching Biology to ensure students' learning.

Specifically, it sought answers to the following: 1) describe the performance of the controlled and experimental group of students in pre-test in Biology; 2) determine the significant difference in the pre-test results of the two groups of students; 3) describe the performance of the controlled and experimental group of students in post-test in Biology; and 4) compare the post-test results of the two groups of students to determine the significant differences.

MATERIALS AND METHODS

The study used quasi-experimental research design. The participants were tested in the controlled condition and experimental condition. Both control and experimental groups were compared, however, the groups were chosen and assigned out of convenience rather than through randomization. The participants were asked to participate in a one quarter program. The students' pre-test score prior to the start of the implementation of the pedagogical tool was measured and then again after the implementation. Two sections were used: one acted as control group and the other acted as treatment group. The participants of this study were 100 Grade 8 students from two different sections handled by the researcher in the School Year 2018-2019. Fifty students from section American Robin were the controlled group and another 50 students from section Egret were under the experimental group. These sections were selected due to their same performance in science in the previous grading.

The researcher used 40 items self-made test aligned with the competencies of curriculum guide in Grade 8 science which content was validated by the master teachers and the department head to ensure the appropriateness of the test items. Table of specifications was prepared to ensure the validity of the test items. High reliability of 0.90 of the test items was measured using Cronbach alpha. Given the approval from the principal and the department head, pre-test was administered to controlled group and experimental group at the beginning of the fourth quarter. Test scores were summarized and compared using the mean, standard deviation and t-test. Controlled group used traditional means of self-reflection while the experimental group used video-aided self-reflection. At the end of the quarter post-test was administered to both controlled and experimental group. Test scores were again summarized and compared using the computed mean and standard deviation. Mean score differences of post-test were calculated and compared using t-test to determine the effectiveness of the video-aided self-reflection.

RESULTS AND DISCUSSION

This part deals with the presentation, analysis and interpretation of data gathered to answer the specific questions posted in the objectives of the study.

1. Performance of the Controlled and Experimental Group of Students in Pre-test in Biology

In every subject area, teachers must first determine the level of students' performance before beginning the chapter of every topic. This is to effectively target the area needed by the learners. In this study, the researcher used the pretest to determine the level of performance of the two groups of student-respondents of the study.

Table 1 shows the computed mean and standard deviation to describe students' performance in their pre-test. Findings revealed that controlled group obtained the highest score



of 21 and the lowest score was one. The computed mean of this group was 8.1 with standard deviation of 2.74. The experimental group had the highest score of 17 and the lowest score was zero.

Table 1
Performance of the Controlled and Experimental Group of Students in Pre-test in Biology

Paired Samples	N	HS	LS	Mean	SD
Controlled Group	50	21	1	8.1	2.74
Experimental Group	50	17	0	6.4	2.34

This group of students garnered the mean of 6.4 and standard deviation of 2.34. The computed mean value of controlled and experimental group showed that their performance in pre-test in Biology was relatively low. This implies that there was a need to provide students with intervention to increase and deepen their skills and knowledge and to provide them the needed support to make progress. According to Shukla (2015) to increase students' motivation in learning there is a need to apply trendy and fashionable means of learning. Integration of technology in providing intervention has great impact on students' performance.

2. Significant Difference in the Pre-test Results of the Two Groups of Students

Effective and efficient methods and strategies in teaching science are the major contributors in the learning process. To employ appropriate strategies in diversity of learners' careful assessment is required. In connection to this, before the implementation of video-aided self-reflection tool, two groups of students were compared prior to the result of their pre-test. This served as basis to determine the effectiveness of the tool given.

Comparison of the mean scores of the controlled and experimental groups had no significant difference since the t-values of 1.59 was less than critical value of 2.01 using 49 degrees of freedom. This could mean that the

two groups did not differ significantly in their performance in relation to their pre-test.

Table 2
Significant Difference in the Pre-Test Results of the Two Groups of students.

	t _c	t-value	p-value	Decision	Interpretation
Pre Test	2.01	1.59	0.118	Accepted	Not significant

Meanwhile, the computed p-value of 0.118 associated with the test statistics was higher than the level of significance set in the study ($p > 0.05$), therefore, the difference in the mean pre-test scores of the two groups of participants was not significant. In view of these, the null hypothesis of no significant difference in the mean scores of the controlled and experimental group was accepted for the pre-test result in Biology. This result implies that at the start of the study, the prior knowledge students were low. To enhance students' performance in Biology there is a great need to provide students with appropriate intervention suitable for the learning needs of the students. In line with the findings was the study of Linnansaari et al. (2015) which found out that students overall interest in Biology is positive but not high. Hence, there was a need to have high level of interest and motivation so that engagement will rise which will result to the improvement of students' performance.

3. Description in the Performance of the Controlled and Experimental Group of Students in Post-test in Biology

Upon the completion of the implementation post test results were reviewed to determine how the video-aided self-reflection tool affect the students' performance in Biology.

Table 3
Performance of the Controlled and Experimental Group of Students in Post-test in Biology

Paired Samples	N	HS	LS	Mean	SD
Controlled Group	50	36	18	25.78	5.38
Experimental Group	50	38	25	28.60	3.38

Table 3 gave away the summary of computation used to describe students' performance in their post-test in Biology. As can be seen from information provided from the table, the controlled group garnered the highest score of 36 and the lowest score of 18. The group obtained the computed mean of 25.78 and the standard deviation of 5.38. However, the experimental group obtained the highest score of 38 and the lowest score of 25. The computed mean and standard deviation of experimental group was 28.60 and 3.38, respectively. The higher mean obtained by the experimental group could probably be due to the positive effect of using video-aided self-reflection on the experimental group. This result signified a deeper understanding of the concepts of Biology which was enhanced by video-aided self-reflection tool. The findings were in congruence to the study conducted by Coffey (2014) which revealed that using video as a tool for learning is beneficial and motivating which lead to performance improvement of every student. The result was affirmed by Xiao and Tobin (2018) when he asserted that video self-reflection is an effective tool for student's reflection. It has significant advantage over reflecting from memory of grounding reflection in an actual instance of learning. Moreover, the incorporation of video into reflection assignments opened the door to reflection in action, rather than merely reflection on action. Video-based reflection then is also more conducive to a type of reflection that is forward-looking. This allowed students to see themselves. This is a promising method in any complex learning environment.

4. Comparison of the Post-test Results of the Two Groups of Students

Video-aided self-reflection was the pedagogical tool used in this study. This provided students opportunity to show their creativity in creating their own videos to reflect on what they have learned. Experimental group was given this tool to check out its effectiveness. Post-test given provided evidence to the main effect of the tool used in this study.

Table 4 displayed the computation used to compare the post-test results of the two

groups of students to determine the significant effect of the video-aided pedagogical tool in teaching Biology.

Table 4

Comparison of the Post-test Results of the Two Groups of Students

	t_c	t-value	p-value	Decision	Interpretation
Post Test	2.01	2.9	0.005	Rejected	Significant

It unveiled the significant differences since the t-value of 2.9 using 49 degrees of freedom was greater than (>) the critical value of 2.01. This revealed that the two groups had different results in post-test indicating the different level of performance in Biology. Moreover, the computed p-value of 0.005 which was lower than the level of significance set in the study ($p > 0.05$) indicated that there were significant differences in the post-test results of controlled and experimental groups in Biology. In view of these, the null hypothesis was rejected. There were significant differences in their mean scores. The results indicated that video-aided self-reflection was effective in developing students' learning compared with the traditional means of self-reflection in teaching Biology. This was in agreement with the study conducted by Scott (2013) which found out that making video and expressing their own ideas through video added students' confidence which resulted to independent learning. Along with this, the use of video-aided self-reflection was found effective to enhance students' performance in Biology. When students reflect on their ideas, processes, and skills they naturally start to take a more active role in their learning. This supported the study of Ayan (2010) which concluded reflective tasks were effective in helping students monitor and manage their own learning. Making self-reflection is a motivating way of revisiting the work they have done in the school for that day.

CONCLUSION

After the analysis of findings and results the following conclusions are drawn:

1. Performance of the controlled and experimental group of students in pre-test in Biology is relatively low.
2. There is no significant difference in the pre-test results of the two groups of students in Biology.
3. Controlled and experimental group achieved better in post-test in Biology. However, both groups had different results in post-test indicating the different level of performance in Biology.
4. There are significant differences in the post-test results in Biology of the controlled and experimental group.

RECOMMENDATION

Based on the findings and results the following recommendations are given:

1. The strategy may be used in other areas of science.
2. Teachers may be equipped with ICT skills to address the needs of the 21st century learners.
3. All schools may be provided with the information and communication technology facilities to maximize students' learning.
4. Further study may be conducted to validate the effectiveness of video-aided self-reflection in teaching.

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