Students' Academic Performance in Science Using Face-to-Face and Modular Instructional Approaches and their Learning Retention

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ABSTRACT

This study aimed to determine academic performance in Science among the Grade 9 students of Buug National High School in the barangay Manlin, Buug, Zamboanga Sibugay. There were 186 student respondents covered out of over 300 students. The final samples of 186 (via Slovin) were taken fairly from 8 sections. Performance of students in science were determined through their grades in face-to-face approach and modular approach. The study further aimed to determine the students' level of learning retention which was realized by administering a 20-item test (standardized) representative of different fields of science. Using a quantitative-descriptive design and correlation design, the study yielded the following major findings. Students' performance in science based on their grades under face-to-face instruction was "Very Satisfactory" while using modular instruction was only "Satisfactory". Students had better performance in science via face-to-face approach compared to modular approach. The students' level of learning retention was only "Moderate". There was no significant correlation between students' performance in science (face-to-face) and their level of learning retention. There was no significant correlation between students' performance in science (modular) and their level of learning. Based on the findings of the study it is concluded that students' Science performance proves better using Face-to-Face approach compared to modular approach. It is concluded further students' level of learning retention which never correlated to both performance (face-to-face and modular) needs to be intervened as learning retention is essential to acquiring or stocking knowledge not only in science but also in other subjects.

Keywords: Science performance, face-to-face, modular instruction, learning retention

1. INTRODUCTION

Education is the only means through through which a society adjusts with its needs. Across the world, education is the primary agent of transformation towards sustainable development. It is a fact that quality science education is a vehicle that plays an important role in producing the best quality of graduates who will become great leaders and manpower for the country.

Yet, a dismal plight has been seen education these days. The existing pandemic has altered education delivery services. The COVID-19 outbreak disrupted life around the globe in 2020. As in any other sector, the COVID-19 pandemic has affected education in many ways. Government actions have followed a common goal of reducing the spread of coronavirus by introducing measures by limiting social contact. Many countries suspended face-to-face teaching affecting students. Where possible, traditional classes are being replaced with books and materials taken from school. Various e-learning platforms enable interaction between teachers and students, and, in some cases, national television shows or social media platforms are being used for education. Some education systems announced exceptional holidays to better prepare for this distance-learning scenario.

Varieties of teaching methods that will fixate on cumulating methods that can best realize the creative and constructive engagement with learning activities that leads to understanding. Even very good de

signed modules, with very well-defined learning outcomes, can fail if the edification strategies employed are infelicitous to inspirit and support the learners towards meeting the desired learning outcomes (Mariani, 2009). Hence, the present study is anchored on two theories: Zone of Proximal Development by Vygotsky and Behaviorism by B.F. Skinner.

Vygotsky posited that learning is problem solving and that the social construction of solutions to problems is the basis of the learning process. Vygotsky described the learning process as the establishment of a "zone of proximal development" in which the teacher, the learner, and a problem to be solved exist. The teacher provides a social environment in which the learner can assemble or construct knowledge necessary to solve the problem. This theory was used since the study ushers learners to assemble or construct knowledge in their self-learning modules (Crain, 2010).

Behaviorism led to the development of taxonomies of learning because it emphasized the study and evaluation of multiple steps in the learning process. Behaviorists repeatedly studied learning activities to deconstruct and define the elements of learning.

Face-to-face learning is an instructional method where course content and learning material are taught in person to a group of students. This allows for a live interaction between a learner and an instructor. It is the most traditional type of learning instruction. Learners benefit from a greater level of interaction with their fellow students as well.

In face-to-face learning, students are held accountable for their progress at the class's specific meeting date and time. Face-to-face learning ensures a better understanding and recollection of lesson content and gives class members a chance to bond with one another.

Modular teaching is one of the most widespread and recognizes teaching learning techniques in many countries including other Western countries and Asian region. Modular approach is used almost in all subjects like natural science, specifically in biology and medical education and even in social sciences as well as in computers education. Manlove and Cavales (2004). It considering the individual differences among the learners which necessitate the planning for adoption of the most appropriate teaching techniques in order to help the individual grow and develop at her/his own pace.

Alumaga (2008) Factors Affecting Chemistry at Secondary Level at Asian Social Science, the major purpose of the study was to explore the impact of modular teaching on the achievements of students. The results of the study were in the favor of modular teaching approach and Findings reported significant gender difference in general comprehension of male and female learners where male learners performed significantly better than female learners on general comprehension-based test therefore, it is suggested that this approach should be widely used in conventional classroom at various levels of education. He further concluded that most learning packages are entirely individualized but group experiences can be built in it. The main driving force behind the introduction of modules in teaching learning process lies in the fact that they have roles that can help to solve key educational problems. This is largely because they satisfy the basic condition for promoting effective learning and are extremely flexible in implementation. The use of such packages takes into account individual differences and permits students to work at their own pace.

2. METHODOLOGY

The researcher design used in the study was descriptive quantitative since the study attempted to describe performances of the students' in Science and the study involved numerical values that were subjected to statistical tests. It also used correlational design as performances of students were correlated to their level of learning retention.

The study was conducted at Buug National High School where the researcher is currently teaching. The said research environment was not only for convenience but also because of the pandemic that has kept people from limited movement.

Buug National High School is located at Purok-3, Brgy. Manlin, Buug, Zamboanga Sibugay Province. The school was founded in 1996 and has a total of 40,000 square meters. It has 43 classrooms (excluding computer lab, and other curriculum workshops) that accommodate 1,800 students enrolled in this current school year. It has 56 regular permanent teachers for both junior and senior high school, and 4 non- teaching personnel and currently headed by Mrs. Elisa Z. Claudio, School Principal III.

Respondents

The respondents of the study were the Grade 9 students of Buug National High School and are officially enrolled for the School Year, 2020-2021. There were 186 students covered as samples from the total population (via Slovin). A total of 350 hundred students comprises the Grade 9 students of Buug National High School from the 8 sections (Gold, Silver, Copper, Bronze, Iron, Zinc, Mercury, and Platinum). Because of this huge population, the researcher used Slovin's formula to get the samples from the total population. The formula is given below:

$$n= \frac{N}{1+ Ne^2}$$

where: n= sample size

N= population size
e= desired margin of error

In order to measure the variables of the study, the following instrument were used: science performances of the students through grades in the two quarters (Grade 8 grades, face-to-face instruction and Grade 9 grades, modular instruction; and, 20-item Science test that is representative of spiral learning of students in various fields of science. T-test was used in determining the significant difference between students' Science performances in face-to-face and modular instructional approaches. Pearson Product Moment Correlation was used to determine Science performances correlate to students' learning retention.

3. RESULTS AND DISCUSSIONS

This study aimed to determine the Science performance of Grade 9 students of Buug National High School in the barangay Manlin, Buug, Zamboanga Sibugay. There were 186 student respondents covered out of over 300 students. The final sample of 186 (via Slovin) were taken fairly from 8 sections. Performance of students in Science were determined through their grades in face-to-face approach and modular approach. The study further aimed to determine the students' level of learning retention which was realized by administering a 20-item test (standardized) representative of different fields of Science.

Using a quantitative-descriptive design with major use of correlation design, the study yielded the following major findings as summarized.

1. Students' performance in Science based on their grades under face-to-face instruction was "Very Satisfactory" as proven by the obtained mean of 85.87.
2. Students' performance in science based on their grades under modular instruction was only "Satisfactory" as proven by the obtained mean of 82.13.
3. There was a significant difference between students' performance using face-to-face and modular approaches as the p-value of .00001 is lesser than 0.05 level of significance. Students had better performance in Science via face-to-face approach compared to modular approach.
4. The students' level of learning retention was only "Moderate" with mean obtained 11.968.
5. There was no significant correlation between students' performance in Science (face-to-face) and their level of learning retention as proven by the statistical result – with p-value of .38029 which is lesser than .05 level of significance.

6. There was no significant correlation between students' performance in Science (modular) and their level of learning retention as proven by the statistical result – with p-value of.811546 which is lesser than .05 level of significance.

4. CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study it is concluded that students' Science performance proves better using Face-to-Face approach compared to modular approach. It is concluded further students' level of learning retention which never correlated to both performance (face-to-face and modular) needs to be intervened as learning retention is essential to acquiring or stocking knowledge not only in science but also in other subjects.

Based on the study's findings, the researcher offers the following recommendations.

1. Teachers teaching sciences need to apply blended learning. Module may not be sufficient as a learning delivery modality.

Online teaching-learning may be added to the existing modality.

2. Teachers also need to come up with multiple ways to improve learning retention of students through regular quizzes and exercises. Home assignments should be given constantly. Video clips that relate to science topics may also be provided to students for their viewing and listening.

3. The Department of Education is encouraged to allocate budget for poor students -- to provide them laptops or netbooks for their use when online teaching-learning will be adopted by teachers or by the school.

4. Future researchers may replicate this study or conduct similar one yet focusing on other curricular subjects.

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