Project EDIT: An Aid to Improve The Academic Performance of Grade 10- Emerald Students in Science Amidst Pandemic

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ABSTRACT: The COVID-19 Pandemic has been one of the most significant disruptions in education in the Philippines. The shift to remote distance teaching meant a rapid change to alternate modes of teaching and learning. The pandemic had a silver lining as it opened doors to new ideas and technologies that could be leveraged to enhance education. Distance learning with self-learning modules is not enough to reach and teach students at Der-An Integrated School, Diffun, Quirino. As a result, different strategies and integration of technologies are being implemented to ensure that learning never stops amidst the pandemic. Thus, this study aimed to determine the academic performance of Grade 10 students in Science. A group Pretest Post-test Research design was utilized to determine the academic performance of Science among Grade 10 students as being affected by Project EDIT (Effective Delivery of Lessons by Integrating Technologies). The technologies being implemented include laptops, mobile phones, and Two-way radios. Prior to the implementation of this project, a pretest was conducted to determine the initial academic performance of the respondents just by the use of purely self-learning modules. Two weeks after the implementation of this project, a post-test was administered to test their academic performance. Employing this design on a group of 22 Grade 10- Emerald Students, the following were found: there is a significant difference in the mean scores of the respondents on their pretest and post-test, and the project EDIT had a large effect. Through the aforementioned results, it was concluded that Project EDIT is an effective tool for class discussion to improve the academic performance of students amidst the pandemic.

Keywords: Project EDIT, Science, Academic Performance, Grade 10-Emerald Students, Two-way Radio, Der-An Integrated School

INTRODUCTION

The coronavirus (COVID-19) pandemic has become a global health crisis and an unprecedented emergency that has affected all global industries, including education [1]. With the widespread implementation of social distancing and self-isolation policies, it is not feasible for educators and students to attend lessons or assessments as they have previously. The COVID-19 pandemic has disrupted our long-standing educational practices and precipitated an urgent need for many institutions to implement alternative educational strategies [2].

To ensure that learning never stops, the Department of Education implemented different strategies to deal with the new normal education system. This includes distance learning, wherein modular, blended, and online-based instruction are ways to reach out to students amidst the pandemic. As the school year 2021-2022 started, many schools in the province of Quirino planned well on what learning modalities to use. Some preferred to use blended learning, while some chose a modular modality of learning. Der-an Integrated School used a type of modular learning to consider the signal connection of each learner. Since the location of the school is considered a remote area. Modes of learning were purely modules during the first two weeks of this school year. However, due to the observation of teachers, more than modular learning is needed to reach and teach students. It was observed in their submitted summative examination that the learners need additional learning modalities to achieve excellent instruction.

With much desire to give quality education to the learners, the researcher conceptualized Project EDIT (Effective Delivery of Lessons by Integrating Technologies), which aims to promote interactive instruction even in this New Normal. Technologies were employed to help the students with their learning activity sheets of self-learning modules since home visits are prohibited under COVID-19. The technologies being implemented are the use of a laptop or cell phone for those who can afford to attend online classes and the use of Two-way radio for those who don't have gadgets to proceed in an online course and for those who are experiencing poor signal connection. Aside from these, supplementary video lessons were given to them. Students were gathered every class online and or by using a Two-way radio.

Technology has aided in the efficient communication required to combat the pandemic that the globe is currently confronting. It also rethinks how the educational system may speed up the delivery of the teaching-learning process in the face of COVID-19 [3]. It may open up new opportunities for learning [4]. Furthermore, due to the school's location, two-way radio is one of the most likely modes of communication at Der-An Integrated School. Lecturers' ability to employ instructional radio increases students' academic progress [5].

Since the researcher is teaching Science, improving the Science performance of her students is her primary concern amidst the pandemic. Although modular learning has been encouraged or pushed for distribution to learners in the present pandemic situation. Still, there is a need for an additional modality to be implemented under this new normal. Hence, this study deals with the determinant of the effects of Project EDIT on the state of academics of Grade 10- emerald students in Science.

Objectives of the Study

This study is designed to determine the effect size of Project EDIT on the learning performance of Grade 10 Emerald Students in Science.

Specifically, it aims to:

1. determine the mean scores of the respondents in the pre-test and post-test;
2. evaluate the significant difference in the mean scores of the respondents in their pre-test and post-test; and
3. evaluate the effect size of Project EDIT on the academic performance of the respondents.

METHODS

Research Design

This study employed the One Group Pre-test Posttest Research design with 22 Grade 10 Emerald Students. Two weeks after the distribution of science modules, a Pre-test was employed to determine the initial academic performance of the respondents just by the use of purely self-learning modules. After this, the Project EDIT was employed. After the project was completely implemented, a post-test on the respondents' state of academic performance was conducted. The teacher-researcher collected the responses in both pre-test and post-test, and the last part of the study was data checking, encoding, analysis, and interpretation of data.

The Intervention Program – PROJECT EDIT

The Project EDIT stands for **E**ffective **D**elivery of lessons by **I**ntegrating **T**echnologies. Table 1 below shows the process where interventions have been implemented with learning remarks.

TABLE 1. Flow of Intervention Program

The week under Quarter 1 SY 2021-2022	Learning Interventions	Remarks
Week 1	Self-Learning Modules	Low Learning Performance
Week 2	Self- Learning Modules	Low Learning Performance
Week 3	Project EDIT Employed	Active Participation Evidence of Learning
Week 4	Project EDIT Employed	Active Participation Evidence of Learning

In every class, students were gathered either online or over two-way radio. There is evidence of participation in every class session. An assessment of their academic performance was given two weeks after the project's implementation.

The researcher chooses Online Distance learning and Two-way Radio as additional modalities in learning due to their benefits:

a. *Online Distance Learning*

The primary purpose of distance education is to break down place and time boundaries. Distance learning enables education to reach those who are unable to physically attend classes [6]. Online

learning is defined as "learning experiences in synchronous or asynchronous situations using various devices with internet connection (e.g., mobile phones, laptops, etc.). Students can be anywhere (independent) in these spaces to learn and connect with teachers and other students" [7]. In contrast to asynchronous learning environments, which are poorly structured, synchronous learning environments have students participate in live lectures, real-time interactions between teachers and students, and the potential for quick feedback. Learning content is not available in the form of live lectures or courses in such a learning environment; instead, it is available through various learning systems and forums. In such a setting, instant feedback and immediate response are not conceivable [8].

b. Two-way Radio

Two-way radios are specifically intended for communication. They are extremely simple to use and lack any extraneous features or functions unrelated to communication. To converse, the user merely needs to select the appropriate frequency and press the push-to-talk (PTT) button [9]. Effective teaching and learning are promoted and enhanced by the use of instructional radio in combination with the lecture technique [6]. Radio remains the most essential source of local information in rural communities, generating shared experiences that help order people's days and common talk that enhances their bonds [10].

Research Environment

The study was conducted at Der-An Integrated School located at Barangay Guribang, Sitio-Der-An, Diffun, Quirino. The school's location is considered urban, with a low signal connection. As a result of the epidemic, the school has chosen Modular Learning as its form of instruction.

Respondents of the Study

This study's respondents were drawn from the school's entire population of Grade 10- Emerald students. There were 11 males and females. The respondents were chosen from among the Grade 10 students currently enrolled at Der-An Integrated School for the school year 2021–2022.

Research Instrument

Test Questions. This study used test questions to gather data. The test questions have two parts: Part I contains 30 multiple-choice questions, and Part II contains 5 Fill-in-the-blank questions to test the learning performance of the respondents in Science, particularly on the topic of Volcanoes, earthquakes, and mountain ranges. There were 12 items for the Volcanoes and earthquakes topic and 11 test items for mountain ranges. The creation of test questions was based on the highest learning competency (MELC) of each topic. Table of Specification (TOS) was accomplished to distribute the item on each category of learning (Knowledge, Process, Understanding). Both TOS and Test questions were validated by the Master Teacher and Head Teacher of the school.

The data gathered were subjected to statistical analysis by the Statistical Package for Social Sciences (SPSS: IBM Corp. Released 2021. IBM SPSS Statistics for Windows, Version 28.0. Armonk, NY: IBM Corp.) to ensure the reliability of computations. The tables generated from the program were the basis for coming up the conclusions and recommendations.

Table 2. Basis for the scores of the respondents in their Pre-test and post-test

Raw Scores	Remarks
26-35	Passed
Below 25	Failed

Data Gathering Procedure
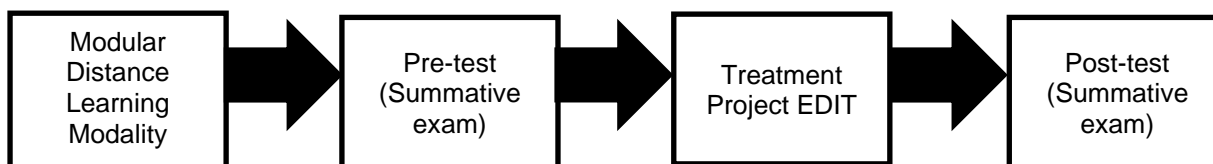
FIGURE1. Flowchart of Teaching Science

The conduct of this study is presented in the conceptual schema illustrated in Figure 1 which is The Flow Chart of Teaching Science. First, modular distance learning was the modality used to reach the students under this normal. Two weeks after the implementation of the modules, a pre-test was employed on them. The average scores of the respondents were calculated. After which the treatment or the intervention was implemented, this was the use of integration of technologies, specifically a

laptop, cellphone, and two-way radio in class discussion. Thereafter, a post-test was conducted to determine the respondents' state of academic performance.

The researcher seeks for the permission to the school head of Der-An Integrated School to conduct study in their school, particularly in the class of the researcher. Part of it was the proposal of the intervention. After the approval of the intervention, the researcher now implemented it in her class discussion.

Treatment of Data

Data were processed through frequency, mean, percent, Eta square

1. Frequency. This was used to determine the number of respondents falling in a certain variable, e.g., sex, age, civil status, educational attainment, division, position, and the categories of innovativeness.
2. Mean. This was used to determine the general learning performance index of the respondents.
3. Percent. This was used to present the proportion of respondents on the different categories of Learning performance.
4. Dependent t-test. This was used to determine significant differences on the learning performance of the respondents in the pretest and posttest conducted.
5. Eta square. This was used to determine the effect size of Project EDIT for a cause on the learning performance of the respondents.

RESULTS AND DISCUSSION.

Mean scores of the respondents in the pre-test and post-test

Table 3 shows the mean Pre-test Post-test scores on the respondents' Academic performance in Volcanoes, earthquakes, and mountain ranges. It reveals that the respondents have a mean pretest score of 17.50 and a mean post-test score of 31.1 in the summative test in Volcanoes, earthquakes, and mountain ranges. It can be noted from the aforementioned table that the mean difference between the posttest and pretest is -13.6. The result indicates that the academic performance of the respondents increased upon conducting the intervention program.

According to Joselle Tus' research on online learning in the Philippines, students' academic performance is very satisfactory, where students still perform well using online distance learning modalities. Studies have demonstrated the good effect of the inclusion of technology on the quality of the instructors' instruction and academic excellence [11].

As indicated by the learning material, context, and learning goals, high-quality distance education utilizes all three generations [12]. They classified and analyzed three generations of distance education pedagogies. Furthermore, they define links between distance education pedagogies and mediating technologies, which are an essential aspect of bridging the spatial-temporal gap between students and teachers in distant education contexts [12].

TABLE 3. Mean Pre-test Post-test Scores on the Respondents' Academic Performance

	Summative Test		Mean Difference	Percent Increase
	Pretest	Posttest		
Summative Test in Volcanoes, earthquakes and mountain ranges	17.50	31.1	-13.6	77.72

Test of significant differences

Table 4 depicts the t-test on the respondents' pre-test and post-test on their academic performance in Volcanoes, earthquakes, and mountain ranges. The t-test reveals significance result on the respondents' Pre-test and Post-test Scores. The existence of a significant result leads to the rejection of the null hypothesis, which is there are no significant differences in the mean academic performance scores of the respondents in their pre-test and post-test.

The result of the study of Hamdan and Amorri indicates that online learning was beneficial for students' academic achievements. A significant number of students reported high comfort levels with attending online courses in the virtual classroom instead of conventional learning. Results indicated students have a positive reception to the online approach rather than traditional classrooms [13].

On the other hand, Ho and Thukral have introduced interactive radio instruction (IRI) as a means of enhancing student learning results. Interactive Radio Instruction (IRI), a teaching tool created on the radio platform, exposes students to regular, curriculum-based learning content while providing teachers with examples of excellent learning activities and classroom management strategies [14].

Furthermore, a number of researches conducted globally have shown that radio can be a useful instrument for closing educational gaps and enhancing students' learning results. Since the 1970s,

countries have incorporated interactive radio into their curricula for disciplines like math, mental arithmetic, English, etc [5].

TABLE 4. Dependent samples t-test on the Respondents' Pre-test and Post-test scores
significant at 0.05 level

	t-value	p-value	Decision
Summative Test in Volcanoes, earthquakes and mountain ranges	-26.52	.000*	Reject Ho

Test of effect size of Project EDIT

Results in Table 5 show that Project EDIT has a large effect on the Academic Performance of the respondents due to the result of the eta value, which is 65.8%. This implies that the intervention implemented is effective in the academic Performance of the students amidst the pandemic.

In research on students' acceptance of online learning during the pandemic, most students desired to continue with some online learning after the pandemic. They also had generally positive impressions of online learning during the pandemic. Other students also mentioned that they found it less scary to type queries in the chat box during live online classes than it did to speak up in front of the class. Some also mentioned that having less time spent traveling to and from school gave them more time to sleep, which benefited their mental and physical well-being. Their study's findings are consistent with other research that also showed how flexible online learning was [15].

Technology for information and communication is used during the learning process in the network. In distance education, the third generation is using technology to enhance learning [5]. When presenting subject information to students, technology acts as a conduit between professors and the latter group.

In times of crisis, technology enables inventive and resilient solutions to counteract disruption, allowing individuals to communicate and even operate online without the need for face-to-face connection. As firms adopt new technologies for interacting and working, several system modifications occur [16]. Approaches that promote active learning focus more on developing students' skills than on transmitting information and require students' explorations of their own attitudes and values.

TABLE 5. Effect Size of the Project EDIT on the Respondents' Pre-test and Post-test Scores on their Academic performance in Volcanoes, earthquakes and mountain ranges

	Eta2 value	Interpretation
Summative Test in Volcanoes, earthquakes and mountain ranges	.658	Large Effect

General agreement of the respondents on the implementation of online distance learning and used of two way-radio.

TABLE 6. General agreement of the respondents on implementing online distance learning and used of two-way radio.

	YES Frequency	Percent	NO Frequency	Percent
Does online distance learning and used of two way radio helps you in performing well in Science amidst pandemic?	22	100.00	0	0.00

The foregoing Table 6 presents the general agreement of the respondents on online distance learning and the use of two-way radio as an additional learning modalities. All of them say that online distance learning and the use of two-way radio in class sessions help them in performing well in Science amidst the pandemic.

Based on the study of Francisco and Barcelona on the effectiveness of an Online Classroom for flexible learning, it was indicated that online learning amidst the pandemic has really a significant contribution to the student's improvement in learning [17].

The results show that Project EDIT is effective and accepted by the students as an aid to improve their academic performance under the new normal education system.

Furthermore, the use of instructional radio in combination with the lecture approach fosters and improves efficient teaching and learning [5]. According to the research by Elliot and Lashley, radio-delivered instruction enhances the learning environment by utilizing resources already in place, including teachers, local cultural artifacts like songs, games, and the environment, instructional materials in the classroom, such as books and the blackboard, the knowledge of local community members, and locally available materials, such as bottle tops, sticks, etc [18].

CONCLUSION

Based on the results of the study, the following conclusions are drawn:

1. The mean score of the respondents in their Pre-test is 17.50, while 31.1 in their Post-test. The result indicates a big mean difference between the mean scores of the respondents, which is 31.1. The result shows that there is an increase in the academic performance of respondents upon conducting the intervention program.
2. Project EDIT has a significant difference in the academic performance of students.
3. According to the result of effect size, Project EDIT has a large effect on student's academic performance in volcanoes, earthquakes, and mountain ranges due to the eta value of .658. This implies that the intervention implemented is effective in the student's academic performance amidst the pandemic.

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