



Perception of the Students and Teachers on the Effectiveness of Modular Distance Modality in Learning Science

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Abstract— Covid-19 has a broad global impact that may be observed in almost every sector, including health, economics, and education. However, despite challenges, most countries have decided to continue their education in various ways. In Narra National High School, Modular Distance Learning is the main modality adopted by the school. This study was conducted to evaluate the extent of efficacy of modular distance learning in Science as viewed by learners and teachers. The results revealed that the level of effectiveness of modular distance modality of learning in Science as perceived by the students and teachers is somewhat effective. It is found out also that most of the students encountered challenges such as some modules are difficult to read and to answer because of very small fonts, some pages are not properly arranged, and more than half of the teachers encountered the difficulty of reproducing modules because they do not have a printer to use. Results further revealed no significant difference between the perception of students and teachers on the level of effectiveness of modular distance modality of learning Science.

Keywords— *Distance Modality in Learning Science, Students' Perceptions, Teachers' Perception, Effectiveness of Distance Modality in Science*

I. INTRODUCTION

Covid-19 has a wide-ranging worldwide influence that can be seen in practically every field, including health, economics, and education. Following the proclamation of the Covid 19 outbreak in March 2020, there has been a slew of daily updates on the virus's impact on millions of people throughout the world. As a result, each country's top concern has been to limit the virus's spread and impact on both the general public and the most vulnerable populations.

As mentioned, one of the most affected by the pandemic is the education sector. It had a huge influence on global education systems, culminating in the near-total shutdown of schools, colleges, and institutions. In 2021, the United Nations Educational, Scientific, and Cultural Organizations (UNESCO) estimated that school and campus closures had touched over 1.5 billion students in 165 countries. Schools, colleges, and universities were pushed to adopt new teaching techniques as a result. [1]

As the government continues to handle the many difficulties created by the pandemic, the country's education department tackles basic education problems. In response to the COVID 19 public health recommendations, the department issued DepEd Order No. 12, series of 2020, establishing the "Basic Education Learning Continuity

Plan for School Year 2021". Schools may utilize one or a combination of learning modalities in compliance with this, based on local health conditions, resource availability, and the learner's unique circumstances. [2].

In Narra National High School, modular distance learning is the main modality adopted by the school. It is supported by Radio-based Instructions in which teachers engaged in broadcasting in delivering lessons. However, several challenges were faced during implementing this type of modalities, such as technical elements, the learners' focus, parents' educational background, and support.

As observed, Science and Technology is one of the subjects that students experience challenges. Considering the nature of Science, learning involves the first-hand experience such as observation, measurement, testing hypotheses, and experimentation. Nevertheless, students are not present at school where laboratory facilities and relevant equipment are provided in this pandemic. Additionally, teachers are not physically present to facilitate if there are any laboratory activities in Science. To evaluate the extent of efficacy of modular distance learning in Science as viewed by students and teachers and the difficulties of the sudden change from traditional to distance learning, this research, therefore, carried out.

II. RELATED WORK

Impact of COVID-19 Pandemic on Education

The unexpected struggles brought by the COVID-19 pandemic have taken a huge toll around the world. As reported on television and in newspapers, people worldwide believed that pandemic had changed their lives. One of the severely affected sectors undergoing massive transition is education.

To acquire knowledge and develop skills, going through formal education is the best option for the public. While attending school can be enjoyable and can help students acquire social skills and knowledge, the primary economic advantage of attending school is that it boosts a student's potential. Even a brief period of school attendance has this effect, and even a brief time of absence from school has consequences for ability development. [3].

As emphasized by UNESCO, many of the world's most susceptible children, teenagers, and adults – including those living in poverty or rural areas, females, immigrants, people with special needs, and those who have been forcefully relocated – have lost opportunities to complete their education resulting from of the current crisis. [4]. It is considered that education cannot be delayed. To ensure the education of millions of Filipino students, the government launched a distance learning program. [5].

Modular Distance Learning

Distance learning, often known as correspondence education or home study, is a type of education in which students and teachers have little or no face-to-face interaction.[6]. It also refers to the process of teaching and learning that takes place outside the traditional classroom. TV/Radio-Based Instruction, Modular Distance Learning (MDL), and Online Distance Learning are the three types of learning delivery techniques (ODL) [7].

Students can use either printed or digital self-learning modules (SLMs), depending on their capability, with modular distance learning. This learning style includes students who seek help from their teachers by text message, phone call, or email. [8].

As a result of the outbreak, modular distance learning has been used to guarantee educational continuity on time. The Philippines is now transitioning to a new educational standard, with educators' continual innovations and active engagement from other stakeholders serving as the driving factors for success. [9].

Modular Distance Learning features a self-learning style. It encourages learners to manage their learning style as they are free to learn at their own pace [10]. The utilization of modules drives learners to study and creates interest and attitude, boosting their confidence while learning.

Modular learning is the most prevalent type of distant learning. All public schools in the Philippines presently

employ this learning technique. According to a Department of Education poll, studying through printed and digital modules is the most chosen distance learning mode among parents with children enrolled this academic year. [11]. This also considers students who reside in remote locations and do not have an internet connection for online learning.

The module's ideas, concepts, and points are regarded to be clearly articulated. In addition, lessons are grammatically correct, and clear and specific directions for learning tasks are given. Students concluded that modules are effective in the learning process [12]. The modular approach is seen to provide flexibility among teachers and learners in the manner of distance teaching [13]. However, there are instances that students submit incomplete weekly activities. Students claimed that they do not have enough time and they struggle to complete all assigned weekly learning tasks. Modules for every learning area include several learning tasks difficult for a student to accomplish [14]. Because of these cases, suggestions arise. Many students and parents proposed support learning modalities. TV shows, radio broadcasts, and other non-internet-based media are examples. [15].

Parents are now exerting effort in playing vital roles in their children's education. They are now the home facilitators of learning. Their role in modular learning extends to establishing a connection and guiding their child [16]. Parents are given additional work in providing technical support. Moreover, they go to school to get and submit modules every scheduled time [17].

Significant issues have already been noted regarding the present deployment of modular remote learning in Philippine institutions. Lack of school funding in the module reproduction and delivery and parents' lack of knowledge, particularly on lessons and learning tasks given, emerged [18]. These MDL problems may lead to developing and refining current programs and standards for modular distance learning deployment.

Aim

This study was conducted to determine the effectiveness level of modular distance modality of learning Science as perceived by the students and teachers in Narra National High School for the School year 2020-2021.

Specifically, it tried to resolve the following queries:

1. What is the level of effectiveness of modular distance modality of learning in Science as perceived by the students?
2. What is the level of effectiveness of modular distance modality in learning Science as perceived by the teachers?
3. What are the difficulties encountered by the students and teachers on modular learning?
4. Is there a significant difference between the level of effectiveness of modular distance modality of learning in Science as perceived by students and teachers?

Research Hypothesis

There is no significant difference between the level of effectiveness of modular distance modality of learning in Science as perceived by students and teachers.

III. METHODOLOGY

Research Design

This study employed a quantitative research design using the descriptive approach to determine the effectiveness of modular learning distance modality as perceived by the students and teachers of Narra National High School. And the correlational approach was used to establish the difference between the teacher’s and students’ perceptions on the effectiveness of modular distance modality of learning in Science.

Participants

A total enumeration sampling technique was employed in this study. The respondents are the Grade 11 Science, Technology, Engineering, and Mathematics students and teachers teaching Science in Narra National High School for the School Year 2020-2021.

Data Tools and Procedures

With the related literature and studies as a guide, the researcher constructed a questionnaire composed of the following parts: part I- The students' perceptions on the effectiveness of Modular Distance Modality and the difficulties encountered in learning Science. Part II- The teachers' perceptions on the effectiveness of Modular Distance Modality and the difficulties encountered in learning Science.

Data analysis

The following statistical tools were used to treat the data

1. Weighted mean was employed to convert quantitative data into qualitative data, particularly in describing student’s perceptions of the effectiveness of Modular Distance Modality in Learning Science.
2. T-test for independent samples was used in finding the difference between the level of effectiveness of modular distance modality of learning in Science as perceived by the students and teachers.

IV. RESULTS AND DISCUSSION

A. Level of Effectiveness of Modular Distance Modality of Learning in Science as Perceived by the Teachers

TABLE 1 LEVEL OF EFFECTIVENESS OF MODULAR DISTANCE LEARNING IN SCIENCE AS PERCEIVED BY THE STUDENTS

Level of Effectiveness	Weighted Mean	Interpretation
The activities in the module sustain my interest in learning Science.	3.49	Somewhat Effective
The examples in the SLM are contextualized, which I can relate to.	3.65	Somewhat Effective

The SLM in Science develops my critical thinking and problem-solving skills.	3.57	Somewhat Effective
Printed modules are the most effective among other modalities.	4.21	Very Effective
The modular distance learning approach helps me improve my self-confidence that I can do the task by myself.	3.75	Somewhat Effective
The assessment given after completing the tasks in Science is appropriate to my needs.	3.49	Somewhat Effective
Composite Mean	3.69	Somewhat Effective

Table 1 shows the students' perception of the level of effectiveness of the modular distance modality of learning in Science. As shown, most of the indicators were perceived by the students as somewhat effective. However, it is worthy to note that among the six indicators, the students perceived that printed modules are the most effective among other modalities as very effective with a weighted mean of 4.21.

B. Level of Effectiveness of Modular Distance Modality of Learning in Science as Perceived by the Teachers

TABLE 2 LEVEL OF EFFECTIVENESS OF MODULAR DISTANCE LEARNING IN SCIENCE AS PERCEIVED BY THE TEACHERS

Level of Effectiveness	Weighted Mean	Interpretation
The activities in the module sustain the interest of the students in learning Science.	3.80	Somewhat Effective
The examples in the SLM are contextualized, which the students can relate to.	3.87	Somewhat Effective
The SLM in Science develops the students' critical thinking and problem-solving skills.	3.53	Somewhat Effective
The modular approach provided sufficient time for the students to complete their exercises at their own pace.	3.60	Somewhat Effective
The modular distance learning approach helps the students improve their self-confidence to do the task by themselves.	3.07	Somewhat Effective
The assessment given after completing the tasks in Science is appropriate to the students' needs.	3.53	Somewhat Effective
Composite Mean	3.57	Somewhat Effective

Table 2 shows the teachers' perception of the level of effectiveness of the modular distance modality of learning in Science. As shown, all of the indicators were perceived by the teachers as somewhat effective. It can also be noted that the indicator “the examples in the SLM are contextualized, which the students can relate to” has the

highest weighted mean of 3.87. In contrast, the indicator “the modular distance learning approach helps the students improve their self-confidence that they can do the task by their selves” Obtained the lowest weighted mean of 3.07.

C. Difficulties Encountered on Sudden Transition from Face-to-Face Instruction to Modular Distance Learning as Perceived by the Students

TABLE 3 DIFFICULTIES ENCOUNTERED ON SUDDEN TRANSITION FROM FACE-TO-FACE INSTRUCTION TO MODULAR DISTANCE LEARNING AS PERCEIVED BY THE STUDENTS

Difficulties Encountered	Frequency	Percentage
No one from my family members goes to school to get my module every scheduled time of distribution and retrieval.	5	7%
No elders in the family/ relatives help me to answer the module.	4	5%
Some modules are difficult to read and answer because of very small fonts, and some pages are not properly arranged.	37	49%
Unstable network signal and internet connection in our places.	11	15%
Insufficient load allowance.	7	9%
Difficulties in independent learning.	11	15%
Total	75	100%

Table 3 presents the difficulties encountered in modular distance learning as perceived by the students. As shown, 37 or 49% of the students encountered difficulty reading and answering some modules because of very small fonts and some pages are not properly arranged.

D. Difficulties Encountered on Sudden Transition from Face-to-Face Instruction to Modular Distance Learning as Perceived by the Teachers

TABLE 4 DIFFICULTIES ENCOUNTERED ON SUDDEN TRANSITION FROM FACE-TO-FACE INSTRUCTION TO MODULAR DISTANCE LEARNING AS PERCEIVED BY THE TEACHERS

Difficulties Encountered	Frequency	Percentage
I do not have any printers to print modules.	9	56%
Difficulties in monitoring student’s outputs and performance.	2	13%
Unstable network signal and internet connection in our places.	2	13%
Difficulties in assessing student’s written works and performance tasks.	1	5%
Difficulties in distribution and retrieval of modules.	2	13%
Total	16	100%

Table 4 presents the difficulties encountered in the sudden transition from face-to-face instruction to modular distance learning as perceived by the teachers. As shown, 9 or 56%

of the teachers encountered the difficulty of not having any printer to print modules.

E. Difference between the Level of Effectiveness of Modular Distance Modality of Learning in Science as Perceived by Students and Teachers

TABLE 5 SIGNIFICANT DIFFERENCE BETWEEN THE LEVEL OF EFFECTIVENESS OF MODULAR DISTANCE MODALITY OF LEARNING IN SCIENCE AS PERCEIVED BY STUDENTS AND TEACHERS

	Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Students’ Perceptions	.12667	.42094	.17185	.31508	.56841	.737	5	.494
Teachers’ Perceptions								

Table 5 reveals the significant difference between the level of effectiveness of modular distance modality of learning in Science as perceived by students and teachers. Since the p-value of 0.494 is greater than 0.05, it leads us to conclude that we fail to reject the null hypothesis. It infers that the perceptions of the students and the teachers' level of effectiveness of modular distance modality of the learning in Science is no significant different.

V. CONCLUSION AND FUTURE SCOPE

1. The level of effectiveness of modular distance modality of learning in Science as perceived by the students is somewhat effective. With this, it is recommended to enhance the learning experiences in modules to make it more enjoyable to maintain the students' interest. Further, tasks that include experimental materials should be easy to contextualize.
2. The effectiveness of modular distance modality of learning in Science as perceived by the teachers is somewhat effective. This result leads to recommendations to develop science modules that address the students' abilities. Topics that are not engaging should be modified and simplified so that the learners can conceptualize them. Science learning competencies, on the other hand, should not be compromised.
3. Most of the students encountered the difficulty that some modules are difficult to read and answer because of very small fonts and some pages are not properly arranged. Teachers ran into this issue due to the large number of modules that needed to be printed. Teachers should ensure that the letters in the modules are standard font size, and printing should be clear and readable.
4. More than half of the teachers encountered the difficulty of not having any printer to print modules. With this, it is suggested that the Department of Education collaborate with other agencies and offices to assist in the

production of self-learning modules and to provide printers to teachers. Furthermore, networking with partners is an efficient way to reach out to them for assistance in this kind of situation.

5. The teachers' and students' perceptions on the effectiveness of modular distance modality of learning in Science are the same.

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