

Effectiveness of Technology-Based Intervention Materials Used During the Home-Based Study of The Grade 10 Students In Difficult Topics In Mathematics

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Abstract — This study aimed to determine the Effectiveness of Technology-based intervention Materials to the Performance of the Grade 10 students in Mathematics. This study utilized Effectiveness of Technology Based Intervention Materials used during the Home-Based study of the Grade 10 Students in Difficult topics in Mathematics in the delivery of the different learning competencies in Mathematics. The output of this study is to provide Intervention plan that will help the teachers in giving different procedures that would allow the learners to learn based on the enhancement given. The results in table 3 implied that considering that the results in finding whether the technology based intervention materials that were used during the home-based study of the grade 10 students in difficult topics in teaching mathematics is really significant giving the fact that the scores after the integration of the above-mentioned strategy which could potentially enhance the learning of the Grade 10 students specially those learning competencies which are considered difficult to teach or to learn by the students themselves. The utilization of the Technology-based intervention materials used during the home-based study of the grade 10 students particularly on the difficult topics is significantly effective and can help the learners improve the way they see Mathematics as a subject. Considering that the mathematics subject is one of the challenging subject in all major subjects taken by the students in any level, this particular strategy shared by the teachers to the learners are very significant in helping the learners to perform their tasks or assignments in connections to the topics or most essential learning competencies in Mathematics that could somehow improve their performance level.

Keywords — *Effectiveness; Technology-Based; Home-Based Study; Mathematics; Grade 10 Students*

I. Introduction

With the current situation that we are facing right now. The education system was greatly affected on how to continue serving society without compromising everyone's health. The Technology-based intervention will help the teachers in delivering their lessons to their students without meeting them physically. It will also help the students in understanding the printed

modules given to them. They may be able to see their teacher teaching online through the use of technology. They can also use the technology as a tool if they have questions and information, they want to know all they need to do is browse the internet for any available materials provided.

One of the most challenging tasks of the teacher is how to capture the learners' attention on the teaching strategy and instructional materials used so that they will totally absorb the lesson imparted by the teacher, since it is the main goal of teaching. Teachers have to strive hard because of the enormous rivals of getting the attention of the learners. Most students nowadays are equipped with different gadgets and being addicted to online games. They can easily access to internet and explore what they want. Making life easy. With these, how can an ordinary classroom teacher defeat the unsurmountable great rival on learner's attention which is the "Technology"?

As a teacher it is a great challenge to me on how to help my students learn independently at this time of pandemic. I need to give additional instructions and materials for learning through the use of technology. Technology-based intervention was very essential and helpful to us teachers to continue monitor and guide our students by giving them online materials to review or study and constantly monitor their progress online. It is also easy on the part of the teacher to harvest the score of the students and can easily assess who are the students who needs intervention and additional support on learning.

Based on the records gathered by the researcher, the problems that the Researcher met during this time student have difficulty in understanding the lesson on their own. Majority of the students have difficulty in answering the activities in mathematics they need to have someone who will guide them while answering activities. Students tend to neglect answering some activities most specially the difficult ones.

The study is expected to contribute good outcome on the part of the students specifically on the attainment of the different tasks given by the teachers specially completing the skills delivered using the different learning modalities based on the norms or standard set by the Department of Education. This study will somehow help the students to fully understand the importance of online learning which could provide them as well as the teachers the different empirical learning of learners performing real educational tasks in this time of pandemic.

This study is conducted to determine the Effectiveness of Technology Based Intervention Materials used during the Home-Based study of the Grade 10 Students in Difficult topics in Mathematics in Linao National High School, Linao, Ormoc City. The findings of the study were bases for the proposed Enhancement Plan.

Specifically, the study sought to answer the following questions:

1. What is the pre-test scores the grade 10 students in Mathematics subject before the integration of the Technology-Based Intervention Materials used during the home-based study?

2. What is the posttest scores of the grade 10 students in Mathematics subject after the integration of Technology-Based Intervention Materials used during the home-based study?
3. Is there a significant difference between the pretest and posttest scores of grade 10 students in Math using the Technology-Based Intervention Materials?
4. What enhancement plan can be proposed on the findings of the study?

Statement of Hypothesis:

Ho: There is no significant difference between the pretest and posttest scores of grade 10 students in Math using the Technology-Based Intervention Materials.

II. Methodology

Design. This study utilized Effectiveness of Technology Based Intervention Materials used during the Home-Based study of the Grade 10 Students in Difficult topics in Mathematics in the delivery of the different learning competencies in Mathematics. The output of this study is to provide Intervention plan that will help the teachers in giving different procedures that would allow the learners to learn based on the enhancement given. Linao National High School in Ormoc City District III, Ormoc City Division is the main locale of the study. The Grade 10 students) are the main respondents of the study and the data based on the students' performance ratings particularly in the pretest and posttest performances were utilized.

Sampling. There are 40 students who are included in the study and the primary means of reach is through Messenger account as well as cell numbers either from the respondents or from their parents. Announcement also was done through face to face discussion of the respondents.

Research Procedure. The researcher prepared the research design and tools to be utilized in the study. Approval and recommendation from the principal was sought. In order to gather the necessary data in 1 month (30 days), the researcher will be asking permission from the office of the Schools Division Office headed by our School Division Superintendent MARILYN B. SIAO, PHD, CESO VI through a Transmittal Letter. The same letter content will be given to the Public-School District Supervisor, School Principal, and to the teachers whom the respondents are under their care.

The researcher now then conducted the pretest performance before integration of the different technology based intervention materials. After administering the pretest, the researcher will now be integrating the new strategy (teaching the lesson on the use of the technology based intervention materials for a matter of 1 month. After the given period of time it will now be checked their leaning through the conduct of the posttest examination. Data was collated and submitted to appropriate statistical treatment.

Ethical Issues. The right to conduct the study was strictly adhered through the approval of the principal, approval of the Superintendent of the Division. Orientation of the respondents both the students and the teachers was done separately.

Treatment of Data. The Effectiveness of the Technology Based Intervention Materials used during the Home Based Study of the Grade 10 students are focused on the study and collecting the pretest and posttest were treated through a weighted mean and descriptions (refer to appendices for the scoring and description). The same data was used to test for the T-test of Mean Difference to test the significant difference.

III. Results and Discussion

TABLE 1
PRE-TEST PERFORMANCE OF GRADE 10 IN MATH

Score Range	Description	PRETEST	
		Frequency	%
37-45	Excellent	4	10
28-36	Very Good	14	34
19-27	Good	12	30
10-18	Fair	7	18
1-9	Poor	3	8
Total		40	100
Weighted Mean		24.70	Good

The table 1 above shows the Mathematics performance of the Grade 10 students before the integration of technology-based intervention materials based on the difficult topics based on most essential learning competencies in mathematics as the teacher applied the home-based study approach in the teaching and learning process of the topics being presented in the 3rd grading period. During the assessment of the performances of the students as to their level of learning in comprehending some of the topics which are considered topics in the Mathematics subject for the 3rd grading period. Before the teacher introduces the new strategies in learning the different difficult lessons in Mathematics, the teacher was just purely given modules to the students in order for them to learn the specific skills during the 3rd grading period. Based from the results in table 1, it shows that among the forty (40) respondents from the 45 items test given to the Grade 10 students for the 3rd grading period, from the score ranging from 1-9, in this performance level it will be considered as poor level of performance which has 3 total number of respondents or 8 percent gained by them while on the score ranging from 10-18 and considered to be in the fair level of performance, there were seven (7) total number of respondents or 18 percent from the 40 total number of respondents took the examination. On the other hand, talking on the good level of

performance which is score ranging from 19-27 has composed of 12 total number of respondents in this level which is equivalent to 30 percent out of the 100 percent or 40 overall total number of respondents involved in this study while on the very good level of performance which has an interval score of 28-36, table shows here that in this level of performance majority of the respondents are belong to this level which is equal to 14 total number of respondents or 34 percent. Lastly, on the highest class interval, which has a score ranging from 37-45 it was found out that there were 4 respondents or 10 percent out from the 40 total number of respondents who were involved in this study.

The result implied that the Grade 10 students who took the pre-test in Mathematics before the integration of technology-based intervention materials used during the home based study particularly on the difficult topics based on the most essential learning competencies were gained a good level of performance in Mathematics which resulted to the weighted mean of 24.70. Based from the results given, it reveals that the Grade 10 students are currently adopting the different learning modality brought about by the different teachers teaching mathematics subject even if they are currently experiencing difficulties not only in learning as well as in processing the different skills to be improved considering that they are not really exposed on the face to face where they can interact to their classmates and to their teachers. The aforementioned situations are literally seen after few years of implementing the distance modality in learning mathematics because they are already adopted with the type of learning technique brought about the pandemic in the delivery of the most essential learning competencies in which even if they are finding different challenges in learning difficult topics they still be able to cope up with the different challenges. Another Reason of why the grade 10 students produced a good level performance it's because some of their parents or guardians have already adopted the different modalities which could help the learners learn the subject and they can easily give technical assistance to the learners if they need them.

Table 2
POST TEST PERFORMANCE OF GRADE 10 IN MATH

Score Range	Description	POST TEST	
		Frequency	%
37-45	Excellent	17	43
28-36	Very Good	17	43
19-27	Good	6	14
10-18	Fair	0	0
1-9	Poor	0	0
Total		40	100
Weighted Mean		34.55	Excellent

The table 2 above shows the Mathematics performance of the Grade 10 students after the integration of technology-based intervention materials based on the difficult topics on most essential learning competencies in mathematics as the teacher applied the home-based study approach in the teaching and learning process of the topics being presented in the 3rd grading period. During the assessment of the performances of the students based on their level of learning in comprehending some of the topics which are considered topics in the Mathematics subject for the 3rd grading period

Based from the results in table 2, it shows that among the forty (40) respondents from the 45 items test given to the Grade 10 students for the 3rd grading period, none of the respondents belong the score from the score ranging from 1-9 and fair level of performance which has a score ranging from 10-18. in the performance level which has a score ranging from 19-27 (Good level) it will be considered as performance in which more acceptable having a total number of respondents which is equal to 7 or 14 percent gained by them while on the score ranging from 28-36 and considered to be in the very good level of performance, there were seventeen (17) total number of respondents or 43 percent from the 40 total number of respondents who took the examination. On the other hand, talking on the excellent level of performance which is score ranging from 37-45 has composed of 17 total number of respondents in which this level which is equivalent to 43 percent out of the 100 percent or 40 overall total number of respondents involved in this study.

The result implied that the Grade 10 students who took the pre-test in Mathematics before the integration of technology-based intervention materials used during the home based study particularly on the difficult topics based on the most essential learning competencies were gained a good level of performance in Mathematics which resulted to the weighted mean of 24.70. Based from the results given, it reveals that the Grade 10 students are currently adopting the different learning modality brought about by the different teachers teaching mathematics subject even if they are currently experiencing difficulties not only in learning as well as in processing the different skills to be improved considering that they are not really exposed on the face to face where they can interact to their classmates and to their teachers. The aforementioned situations are literally seen after few years of implementing the distance modality in learning mathematics because they are already adopted with the type of learning technique brought about the pandemic in the delivery of the most essential learning competencies in which even if they are finding different challenges in learning difficult topics they still be able to cope up with the different challenges. Another Reason of why the grade 10 students produced a good level performance it's because some of their parents or guardians have already adopted the different modalities which could help the learners learn the subject and they can easily give technical assistance to the learners if they need them.

Table 3
Test of Difference Between the Scores in the Pre-test and Post-test of Grade 10 in MATH

Aspects	Test Scores		Computed T	Critical T	Decision	Interpretation
Grade 10 Math	Pre	24.70	2.113	0.231	Reject H_0	Significant
	Post	34.55				

The Table 3 presents the test of difference between the scores of the pretest and posttest in Mathematics of the Grade 10 students before and after the integration of Technology-Based Intervention Materials used during the home-based study of the grade 10 students which particularly focused on the difficult topics in the aforementioned subject for the third grading period. The results revealed that the pre-test scores which is equal to the 24.70 is less than the posttest scores which is equal to 34.55 which resulted to the computed T value which resulted to the value of 2.113 and it was also revealed that the computed t value is greater than the critical t value which has an equivalent value of 0.213. Therefore, the null hypothesis which states that there is no significant difference between the scores in the pretest and posttest scores of the Grade 10 students in Mathematics is rejected.

The results in table 3 implied that considering that the results in finding whether the technology based intervention materials that were used during the home-based study of the grade 10 students in difficult topics in teaching mathematics is really significant giving the fact that the scores after the integration of the above-mentioned strategy which could potentially enhance the learning of the Grade 10 students specially those learning competencies which are considered difficult to teach or to learn by the students themselves. The utilization of the Technology-based intervention materials used during the home-based study of the grade 10 students particularly on the difficult topics is significantly effective and can help the learners improve the way they see Mathematics as a subject. Considering that the mathematics subject is one of the challenging subject in all major subjects taken by the students in any level, this particular strategy shared by the teachers to the learners are very significant in helping the learners to perform their tasks or assignments in connections to the topics or most essential learning competencies in Mathematics that could somehow improve their performance level.

IV. Conclusion

Based from the findings of the study, the technology-based intervention materials used during the home-based study of the Grade 10 students in difficult topics in teaching Mathematics is significantly effective in improving the performance of the Grade 10 students especially to those topics which are identified as difficult topics to be learned by them.

V. Recommendations

1. The proposed enhancement plan should be utilized.
2. The School Head should monitor the teachers on the use of the home based intervention materials particularly on its usage to the home based study approach in teaching major subjects particularly on the Mathematics subject.
3. School Head should monitor the teaching and learning process using the technology based materials specially in this time of limited face to face.
4. The teachers continue to develop different technology based intervention materials that would help students specially those who are struggling in learning the different difficult topics in Mathematics.
5. In relation to the abovementioned, the researcher is giving the authority to those future researchers to conduct the same study to assess the results or effectiveness of the study.

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