International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Video Lessons as Supplemental Instruction for Grade 9 Students during the COVID-19 Pandemic

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Abstract: ***The Department of Education (DepEd) implemented the modular learning modality in public schools amidst the pandemic. The study aimed to examine the effectiveness of the video lesson as supplementary instructional material to the module. Ninety respondents from Grade 9 students at Beatriz D. Durano Memorial National High School were selected and divided into experimental and control groups. The study employed the quasi-experimental research design and lasted for four weeks. Questionnaires were used in gathering the demographic data. They drew the percentages, ranks, and averages from the variables. A 48-item exam was administered in pre-test and post-test to measure the respondents' academic performance. Most of the respondents' ages were appropriate for the Grade 9 level. The majority were in the poor income group. Mobile data was the dominant source of internet connection, and the device used was primarily smartphones. Concerning academic performance, both groups did poorly in the pre-test. In the post-test, they did fairly satisfactorily; however, the experimental group performed slightly better. T-test was used for statistical treatment. The results revealed that no significant differences in the pre-test and post-test performances of the two groups; likewise, there was no significant main gain difference on the pre-test and post-test scores between the two groups. It is recommended that the teacher-made video lessons be used as supplementary instructional materials to the modules and apply the theories incorporated in this study to other video lessons.***

Keywords: Teaching Mathematics, video lesson, supplemental instruction, quasi-experimental research

1. Introduction

The COVID-19 pandemic drastically changed the way how education was delivered globally. With its sudden occurrence, educational leaders were caught off guard at the onset. Schools scrambled on what appropriate approaches they would use to make teaching and learning effective as they were used to be.

The Philippine response to the threat of COVID-19 in education was by providing various Learning Delivery Modalities. Modular Distance Learning was adopted in most public schools. The students had a hard time understanding math concepts due to a lack of explanations in the modules, by making them more comprehensive and detailed could result in their reproduction being more expensive; thus, the situation was difficult for those cash-strapped schools.

The researcher explored another option by providing teacher-made video lessons to the learners, an alternative way to give detailed discussions of the topics found in the module, and supplemental instructional materials for Math 9 subjects, specifically Quadratic Equation topics.

In this context, the researcher was encouraged to determine the effectiveness of the teacher-made video lessons as supplementary instructional materials for Grade 9 students in learning Quadratic Equations. The findings of this study served as the basis for an enhanced instructional development plan to improve the students' learning engagement during the time of the COVID-19 pandemic.

Here in the Philippines, Dangle and Sumaoang examined the challenges that the students, parents, and teachers were facing in the implementation of modular distance learning. The study revealed that parents were even more involved in educating their children as facilitators in homeschooling; however, the downside was that some of them were struggling because of knowledge deficiency of the subject matter. Moreover, it was difficult for them to juggle their jobs and perform as learning facilitators, and some students lacked the discipline to study independently [1].

The mathematics subject was too challenging for them, particularly problem-solving, because of insufficient explanation. The teachers conducted home visitations and offered online consultations to cope with these challenges.

Conducting home visitation to many students was overwhelming to teachers; one of the prevalent problems in public schools. Sometimes teachers missed this out due to the many tasks they had performed. They had to juggle their work like checking the learners' outputs, preparing the Teacher's Weekly Plan (TWP) and Weekly Home Learning Plan (WHLP), giving feedback to learners and parents, and printing and sorting modules for the preceding distribution.

To remedy these challenging situations, teachers adopted the online consultation to cater to the students' needs because it was more practical. On the other hand, its effectiveness relied on the internet's connectivity and availability.

The prevailing problem encountered by the students using the module was the lack of explanation, particularly in math subjects; with this, a video lesson would fill that gap. Modular Distance Learning needed supplementary instructional material such as video lessons to compensate for some inadequacies.

A video lesson was an ideal supplementary material to the module, especially during the pandemic when face-to-face instruction was not feasible. It became the dominant medium in capturing and distributing information while giving a stimulating learning environment that supported students for better understanding and retaining information [2].

This study was anchored on the Pedagogic Video Design Principles by Jack Koumi, the Seven-Principle Model in Designing and Developing Video Lessons by David A. Joyner and Ashok K. Goel, Film theory, Cognitive Theory of Multimedia and the Results-Based Performance Management System (RPMS).

Nowadays, video is widely used in teaching and learning and has been around for decades already. Today it is a vital element of the online learning platforms or the Massive Open Online Courses (MOOCs) as a model for content delivery. They are popular sites with millions of learners worldwide and gaining even more online students during the pandemic

Koumi proposed a structure for how to achieve cognitive objectives. In the Pedagogic narrative framework, there are 31 design principles in the eight categories. When these principles are applied, they allow the students to learn the lessons' concepts and principles and develop problem-solving skills [3].

The principles consist of video techniques and teaching functions inherent in the video; when properly applied, it would be at par or even highly effective as face-to-face instruction. It can facilitate learning by depicting real-life experiences, cause affective changes to one's emotions and attitude, and teach skills through demonstrations.

These roles are the video's unique characteristics that make it capable of achieving four (4) learning domains: the cognitive, experiential, affective, and skills compared to three (3) in Bloom's taxonomy.

Aside from those pedagogic roles of video presented by Jack Koumi, there is also a seven-principle model in designing and developing video lessons espoused by Ou et al., (2019) [4].

Teachers have no definitive aim in choosing videos for their lessons. They are just basing it on their intuition. To make the video lessons more effective, they must be aim-oriented. Adopting the Film Theory gives the teacher a clear direction in selecting the appropriate videos to attain the desired objectives. There are two (2) main factors to examine closely in film studies: the flow of information and the audio-visual presentation. The first is the formal system, which shows how information is selected, composed, and colored. The second is the stylistic system, which refers to how some information is audio-visually presented in mise-en-scene, cinematography, editing, and sound [5]. Regarding the educational film, it leads the viewer to learn something by showing educational content. The teacher's aims are categorized into four: doing, engaging, saying, and seeing.

Learners felt isolated in this pandemic [6]. To prevent the students' further isolation, the researcher employed a medium-sized talking head up to the waist in the video lesson to resemble talking to them like in face-to-face classes because there were instances when they could not even recognize their teacher.

The way the talking head was placed on the videos was the "presence in picture" and placed at either side of the slide depending on the presentation so that it would not block some vital information. In some instances, talking heads were not shown because the slides were filled with texts and images that were more important.

The commonly used format in most video lessons is the picture-in-picture. Pi et al., (2017) evaluated video lectures with small, medium, and large sizes of instructors' talking heads. The findings revealed that students experienced more learning satisfaction watching those small and medium-sized ones [7].

Verbal and nonverbal communications are intrinsic to charismatic teachers such as: a simple smile, facial expressions, and gestures play vital roles in conveying information, and even the teacher's pointing gestures and directed gaze at the contents improve learning performance (Pi et al., 2018). These will guide the students to the relevant learning content in the slide; in such a way that it directs their focus, and they pay more attention to the presented information.

Rueckert et al. (2017) examined the effects of gestures if they could enhance students' learning of a complex statistical concept. The result revealed that those who watched a video lesson with gestures learned significantly more [8].

Lalian (2019) conducted a meta-analysis on the effects of Math video tutorials on the students' cognitive and affective aspects from 18 research articles; it showed that the results leaned more toward the cognitive side in achieving learning [9].

Regarding the affective aspects, the video tutorials developed their understanding and improved learning outcomes, thus motivating them to attend more math lessons. Increasing students' interest through contextualization is essential in designing a lesson by providing meaningful activities.

Video lesson is one of the alternatives to face-to-face instruction. DepEd has seen its importance; it is one of the preferences for classroom observation and artifact in the teachers' performance rating.

Careful and thoughtful planning should be done to make it at par with face-to-face instruction; both have similarities in their preparations, but the teacher must make considerations about the video's inherent presentational attributes. It will make the lesson delivery more compelling if it is done properly.

In designing the video lesson, the researcher applied some of the 33 categories of pedagogic roles for video by Jack Koumi and the Four-Phase Instruction Principle by KBAI. The purpose of the study was to examine whether the video lessons created by the researcher following those theories would clarify the concepts and improve the learners' academic performance. Moreover, it would pave the way for teachers to explore the theories applied by the researcher or look for other theories which they consider advantageous in making their video lesson fascinating and didactic.

2. The Problem

2.1 Statement of the Problem

This research assessed the effectiveness of the video lessons as supplemental instruction for the Grade 9 students in learning Quadratic Equations during the COVID-19 pandemic at Beatriz D. Durano Memorial National High School in Danao City Division for the school year 2021-2022.

Specifically, it sought answers to the following questions:

1) What is the respondent-groups' profile in terms of:
   a) Age and gender,
   b) Combined family monthly income,
   c) Internet accessibility, and
   d) Availability of devices at home?
2) What is the level of the performance of the two groups in Quadratic Equations during the pre-test:
   a) Control group, and
   b) Experimental group?
3) What is the level of the performance of the two groups in Quadratic Equations during the post-test:
   a) Control group, and
   b) Experimental group?
4) Is there a significant difference between the pre-test and post-test scores of the:
   a) Control group,
   b) Experimental group?
5) Is there a significant mean gain difference on the pre-test and post-test scores between the control and the experimental group?
6) Based on the findings of the study, what math performance enhancement plan may be developed?

2.2 Statement of the Null Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

Ho1: There is no significant difference between the pre-test and post-test scores of the:

a) Control group,
b) Experimental group.

Ho2: There is no significant mean gain difference on the pre-test and post-test scores between the control and the experimental group.

3. Methods

3.1 Design

Table 1: Distribution of the Respondents

Group	*n*	*%*
Experimental	45	50.00
Control	45	50.00
Total	90	100.00

The study combined descriptive and qualitative research designs. For the descriptive method, it gathered information about respondents' profiles: their age and gender, combined family income, internet accessibility, and availability of devices at home. On the other hand, the qualitative method employed a Quasi-experimental research design to assess the effectiveness of video lessons as supplemental instructions to the Grade 9 students while learning the concepts of quadratic equations through modular distance learning.

3.2 Respondents

The respondents were composed of 6 (six) sections with a minimum of 45 students each, with 270 enrollees in all. This study used the between-subjects design. Two (2) sections were chosen for the study: the Bonifacio section was chosen as the control group, while the Rizal section was the experimental group. These (2) sections were selected due to their similar academic performance level in Math subject in the previous school year.

3.3 Instrument

This research study used three instruments: the survey questionnaire, video lessons, and the 48-item test questions for the pre-test and post-test. The test was composed of 60 percent easy under the knowledge and understanding; 30 percent medium-level under the analyzing and applying; lastly, 10 percent difficult under the evaluating and creating.

The respondents were provided with a video lesson each week, an average length of 45 minutes, and a total of four (4) video lessons created by the researcher for the entire duration of the study with contents that were based on the Most Essential Learning Competencies (MELC).

3.4 Data Gathering Procedure

Preliminary Preparation. The researcher first prepared and secured a letter of approval from the Division superintendent. The researcher handed in the letter to the principal and then personally explained the purpose of the research - the benefits that the school, teachers, and students would derive from it.

3.5 Data Gathering Stage

At the start of the research study, the survey questionnaires and test papers for the pre-test were given to students during the module distribution. The questionnaires were collected at the end of the week during the module retrieval.

The pre-test was conducted using Google meet, and the students were provided with a schedule and a link the day before the exam. During the exam, they were required to turn on their cameras so that the teacher could monitor the things they were doing. They were given one (1) hour to finish the test, and then they immediately took pictures of their answer sheets and sent them through messenger. The same procedures were applied in the distribution of test papers for the post-test in the fourth (4th) week, which was the end of the study.

Students who belonged to the experimental group were monitored weekly to make sure if they watched the videos. They had to answer a 10-item test with questions based on the video lessons they watched.

3.6 Statistical Treatment of Data

The qualitative data were extracted from the survey questionnaire about the respondents' profiles. The quantitative data were the respondents' scores in their pre-test and post-test. The following were the statistical tools to be used:

The percentage was used for profile, pre and post-test performance of the respondents.

Frequency count was used for profile, pre and post-test performance of the respondents.

Paired t-test was used to test the difference between the pre and post-test scores of the two groups.

T-test for uncorrelated means was used to test the mean gain difference of the scores between the two groups.

3.7 Scoring Procedure

The respondents scores were categorized into six (6)

Range of Scores	Descriptive Rating	Verbal Interpretation
41-48	Outstanding	Showed excellent performance of the competencies required in the lessons
33-40	Very Satisfactory	Showed above-average performance of the competencies required in the lessons
25-32	Satisfactory	Showed enough performance of the competencies required in the lessons
17-24	Fairly Satisfactory	Showed minimal performance of the competencies required in the lessons
9-16	Poor	Showed low performance of the competencies required in the lessons
0-8	Needs Improvement	Showed no learning of the competencies required in the lessons

4. Results

4.1 Profile of the Respondents

It covers the age and gender, combined family income, sources of internet connection, and available devices at home.

4.1.1 Age and Gender

Table 2: Age and Gender of the Respondents

Age (in years)	Experimental Group				Control Group				Total	
	Male		Female		Male		Female			
	f	%	f	%	f	%	f	%	f	%
19 and above	0	0	0	0	1	1.11	1	1.11	2	2.22
16 – 18	2	2.22	3	3.33	2	2.22	2	2.22	9	10
13 – 15	14	15.56	26	28.89	14	15.56	25	27.78	79	87.78
Total	16	17.78	29	32.22	17	18.89	28	31.11	90	100

As shown in Table 2, there were 16 male students, or 17.78 percent, and 29 female students, or 32.22 percent in the experimental group from the 90 respondents of both groups.

There were 14 male students or 15.56 percent within 13 – 15 years old, whereas 26 or 28.89 percent were females. Two (2) or 2.22 percent were male students between 16 – 18 years old, whereas three (3) or 3.33 percent were females.

In the control group, there were 17 or 18.89 percent, male students, whereas 28 or 31.11 percent were female students from the total of 90 respondents in both groups.

There were 14 or 15.56 male students between 13 – 15 years old, whereas 25 or 27.78 percent were females. Two (2) or 2.22 percent in male as well as in female students within 16 – 18 years old. Finally, one (1) or 1.11 percent in male as well as in female students within 19 years old and above.

The total number of students in both experimental and control groups within 13 – 15 years old was 79 or 87.78 percent, nine (9) or 10 percent within 16 – 18 years old, and 2 or 2.22 percent within 19 years old and above.

Most of the respondents in both experimental and control groups were at the appropriate age for the Grade 9 level.

The ideal age for Grade 9 students in the Philippine Educational System is 14 to 15 years old because the required age for a child to be enrolled in kindergarten is five (5) years old, which is the cut-off age.

If there are older students in a certain grade level, they are usually balik-aral and repeaters. These are the students who mostly performed poorly in school, not due to their age but other factors such as family, psychological, and financial problems that affect their studies [10].

4.1.2 Combined Family Monthly Income

It is the combined gross income of all household members. These data were important because they gave some ideas of how the family spent on devices and internet connectivity which were the other variables in this study.

Table 3: Combined Family Monthly Income of the Respondents

Monthly Income (in pesos)	Experimental Group		Control Group		Total	
	f	%	*f*	%	*f*	%
Above 30, 000	1	2.22	1	2.22	2	2.22
25, 001 – 30, 000	0	0	2	4.40	2	2.22
20, 001 – 25, 000	1	2.22	1	2.22	2	2.22
15, 001 – 20, 000	2	4.44	7	15.56	9	10
10,001 – 15, 000	7	15.56	2	4.44	9	10
10, 000 and below	34	75.56	32	71.11	66	73.33
Total	45	100	45	100	90	100.00

In table 3, the combined family income of the experimental group revealed that 34 or 75.56 percent of the respondents were within the ₱10,000 and below. Seven (7) or 15.56 percent of the respondents were within ₱10,001 – 15,000. Two (2) or 4.44 percent of the respondents were within ₱15,001 – 20,000. One (1) or 2.22 percent of the respondents were within ₱20,001 – 25,000. None within ₱25,001 – 30,000. Lastly, one (1) or 2.22 percent of the respondents were within above ₱30,000.

On the other hand, in the control group. Thirty-two or 71.11 percent of the respondents were within the ₱10,000 and below. Two (2) or4.44 percent of the respondents were within ₱10,001 – 15,000.

Seven (7) or 15.56 percent of the respondents were within the ₱15,001 – 20,000. One (1) or 2.22 percent of the respondent was within the ₱20, 001 – 25, 000. Two (2) or 4.40 of the respondents were within ₱25,001 – 30, 000. Lastly, one (1) or 2.22 percent of the respondents were within above ₱30,000.

In total, 66 or 73.33 percent of the respondents were within ₱10,000 and below. Nine (9) or 10 percent of the respondents were within ₱10,001 – 15, 000 and ₱15,001 – 20,000 respectively. Lastly, two (2) or 2.22 percent of the respondents were within ₱20,001 – 25,000, ₱25,001 – 30,000, and above 30,000 respectively.

In a document published by the Philippine Institute for Philippine studies, a combined monthly family income of five (5) members below ₱10,957 per month belongs to the poor income group. Those within the bracket of ₱10, 957 to ₱21, 914 belong to the low-income (but not poor) group, and within the bracket of ₱21,914 to ₱43,828 belong to the middle-income group [11].

In the first semester of 2021, there were around 26.14 million Filipinos whose per capita income did not sufficiently meet the basic food and non-food needs, and about 10.94 million Filipinos with income that did not meet the basic food needs [12].

Most of the respondents were from poor families, which accounted for 77.33 percent or three-fourths of the total 90 respondents. Poor families spend nearly half or 41.5 percent of their monthly income on food and less on clothing and other necessities such as housing, electricity, health, and education [13]. It is implied that these families would hardly spend more on devices, especially the expensive ones because their utmost priority is food.

4.1.3Internet Accessibility

The data provide some information as to the means of how the students in the experimental group would access the video lessons uploaded on YouTube, especially those who preferred using online.

There are five (5) sources of internet connection that are available publicly and privately for individuals to access. Mobile data: internet connectivity provided by the phone's internet service provider. Personal Wi-Fi: a privately-owned router that sends a signal in a household. Peso Net: a public pre-paid internet connection that uses a coin-drop machine that is ideal for low-income users. Internet cafe: a business establishment that offers internet connection to the public on an hourly or minute basis. Lastly, the neighbor's wi-fi: is an internet connection provided by a neighbor, either free or paid.

Table 4: Internet Accessibility

Source	Experimental Group		Control Group		Total	
	f	*Rank*	*f*	*Rank*	*f*	*Rank*
Mobile Data	29	1	24	1	55	1
Personal Wi-Fi	28	2	7	3	40	2
Peso Net	15	3	17	2	37	3
Internet café	7	4	1	4.5	13	4
Neighbor's Wi-Fi	2	5	1	4.5	9	5
*Multiple Response						

Table 4 shows that all sources of internet connection of both groups are almost similar. Except the second and third ranks that are interchanged, the personal Wi-Fi and peso net.

The mobile data was the students' primary source of internet connection, which ranked first in both experimental and control groups, with 29 and 24 users, respectively. Personal wi-fi was ranked second with 28 users in the experimental group, whereas it was ranked third with seven (7) users in the control group. Peso net was ranked third in both experimental and control groups with 15 and 17 users, respectively. The Internet cafe was ranked fourth with seven (7) users in the experimental group, whereas it was ranked 4.5 with one (1) user in the control group. Neighbor's wi-fi was ranked fifth with two (2) users in the experimental group, whereas it ranked 4.5 with one (1) user in the control group.

In the overall ranking, the mobile data was ranked first with 55 users. Ranked second was the personal wi-fi with 40 users. Ranked third was the peso net with 37 users. Ranked fourth was the internet café with 13 users. Ranked fifth was the neighbor's wi-fi with nine (9) users.

The experimental group was not necessarily required to have an internet connection. It had the option to bring storage devices during the distribution of modules to have copies of the videos and play them on any available devices at home.

To those who opted to use online, the researcher provided

them with links to her YouTube channel. The researcher chose this platform because it can be accessed freely and is popular with students. Filipinos spent an immense amount of time online at an average of 11 hours per day, overtaking the rest of the countries and still the world's biggest consumer of social media, with YouTube as the no.1 platform [14].

Mobile data was the most preferred source of internet connection for students due to its affordability and mobility. This result was supported by other findings in this study in table 3, the combined family income, and table 5, the available devices at home. The prevalent device at home was the cellphone, and the leading source of connectivity was the mobile data. The Philippine mobile internet user in 2020 was 72.1 percent and it is estimated that by 2025, 77.1 percent of mobile users would access the internet through their mobile phones; thus, increasing mobile subscribers [15].

Regarding mobile data pricing, the Philippines ranked 97 among 230 countries. The average price is $1.77 per 1GB of data - this is in comparison to over 6,000 data plans, with $0.65 being the cheapest and $8.21 being the most expensive [16]. There are telecommunication companies in the Philippines that offer even lower than $0.65, and the reason why most students have chosen this kind of internet connectivity.

4.1.4Availability of Devices at Home

The data in table 5 would provide some information on the kind of devices that were available and prevalent in the student's home. These devices were probably the ones that they were using in watching the video lessons.

Table 5: Availability of Devices at Home

Devices	Experimental Group		Control Group		Total	
	f	*Rank*	*f*	*Rank*	*f*	*Rank*
Smartphone	40	1	45	1	85	1
TV	14	2	15	2	29	2
Laptop	4	4	5	3	9	3
Desktop	5	3	3	4	8	4
Tablet	2	5	2	5	4	5
*Multiple Response						

The primary device that was available at home was the smartphone. It was ranked first in both experimental and control groups with 40 and 45 devices, respectively. TV was ranked second in both experimental and control groups with 14 and 15 devices, respectively. The desktop was ranked third in the experimental group with five (5) devices, whereas it was ranked fourth with three (3) devices in the control group. Tablet was ranked fifth in both experimental and control groups with two (2) devices in each group respectively.

The result corroborated with the national survey that mobile phones (any type) and smartphones are the prevailing devices used by Filipinos [17]. There are brands in the Philippine market that offers below ₱ 2,000.00. The smartphone is a popular device used by Filipinos due to its affordability and usability.

4.2 Level of Academic Performance of the Respondent–Groups in Quadratic Equations during the Pre-Test

Table 6 revealed the results on the students' scores during the pre-test. Its purpose was to establish a subject-knowledge baseline and make comparisons as to the level of their academic performance. Through pre-test, it would be determined if the students know already about the lesson [18].

They were categorized into five (5): outstanding, very satisfactory, satisfactory, and fairly satisfactory. Through this, the students' academic performance level was determined as to how they fared in the test.

Table 6: Level of Academic Performance of the Respondent–Groups in Quadratic Equations During the Pre-Test

Level	Ranges of Scores	Experimental		Control	
		f	%	*f*	%
Outstanding	41 – 48	0	0	0	0
Very Satisfactory	33 – 40	1	2.22	0	0
Satisfactory	25 – 32	1	2. 22	0	0
Fairly Satisfactory	17 – 24	13	28.89	14	33.11
Poor	9 – 16	25	55.56	21	46.67
Needs Improvement	0 – 8	5	11.11	10	31.11
Total		45	100.00	45	100.00
Average		14.00		13.09	

The data above showed that none in the experimental and control groups got an outstanding performance. One (1) or 2.22 percent of the respondents in the experimental group got very satisfactory performance, whereas non in the control group. One (1) or 2.22 percent of the respondents in the experimental group got satisfactory performance, whereas non in the control group. Thirteen or 28.89 percent of the respondents in the experimental group got fairly satisfactory performance, whereas 14 or 33.11 percent in the control group. Twenty-five or 56.56 percent of the respondents in the experimental group got poor performance, whereas 21 or 46.67 in the control group. Five (5) or 11.11 percent of the respondents in the experimental group got needs improvement performance, whereas 10 or 31.11 percent in the control group.

The average score of the experimental group was 14.00, whereas in the control group was 13.09. Comparing the averages to the scale, both groups performed poorly in the pre-test. It revealed that the students in both groups had no prior knowledge of the lessons.

4.3 Level of Academic Performance of the Respondent-Groups in Quadratic Equations during the Post-Test

The purpose of the post-test is to determine the students' mastery of the specific learning goals. The data presented in table 7 were the post-test results of both experimental and control groups to identify which group performed better.

Table 7: Level of Academic Performance of the Respondent-groups in Quadratic Equations during the Post-test

Level	Range of Scores	Experimental		Control	
		f	%	f	%
Outstanding	41 – 48	0	0	0	0
Very Satisfactory	33 – 40	3	6.68	4	8.89
Satisfactory	25 – 32	18	40.00	14	31.11
Fairly Satisfactory	17 – 24	15	33.33	10	22.22
Poor	9 – 16	9	20	16	35.56
Needs Improvement	0 – 8	0	0	1	2.22
Total		45	100	45	100
Average		22.71		19.98	

The results in table 7 showed that none of both groups got an outstanding performance. Three (3) or 6.68 percent in the experimental group got very satisfactory performance, whereas four (4) or 8.89 percent in the control group.

Eighteen or 40 percent got very satisfactory performance in the experimental group, whereas four (4) or 8.89 percent in the control group. Fifteen or 33.33 percent got fairly satisfactory performance in the experimental groups, whereas 10 or 22.22 percent in the control group. Nine (9) or 20 percent got poor performance in the experimental group, whereas 16 or 2.22 percent in the control group. None got the needs improvement performance in the experimental group, whereas one (1) or 2.22 percent in the control group.

The average score of the experimental group was 22.71, whereas 19.98 in the control group. Comparing the averages to the scale, both groups performed fairly satisfactorily.

By examining the data closely, the students' academic performance in the experimental group, improved slightly. None of them fell in the needs improvement category. Fewer performed poorly, and more did modestly better than the control group. It showed that the video lessons helped the learners in understanding the concepts better.

4.4 Test of Significant Difference on the Pre-Test Performances of the Two Groups

The data in table 8 revealed the test results on the significant differences between the groups' pre-test performances. It used the t-value and p-value in presenting the significant value between them.

Table 8: Test of Significant Difference on the Pre-test Performances of the Two Groups

Source of Difference	Mean	Standard Deviation	Mean Difference	Computed t- value	p-value	Decision	Result
Control	13.08	4.65	-0.91	-0.800	.428	Failed to reject H0	Not Significant
Experimental	14.00	5.85					
*significant at $p < 0.05$ (two-tailed)							

As presented in table 8, the control group ($\bar{x}$=13.08, sd = 4.65) and the experimental group ($\bar{x}$=14.00, sd = 5.85) had a mean difference of -0.91 with a computed t-value of -0.800 and p-value of .428, which implied that there was no significant difference between the groups' pre-test scores; thus, it failed to reject the null hypothesis.

It showed that both groups had no prior knowledge about the topic and indicated that it was an ideal basis in determining how much improvement they would gain after the study. Since it used a between-subject design, each group should have similar characteristics [19]. In this case, both groups had the comparable mental ability.

4.5 Test of Significant Difference on the Post-Test Performances of the Two Groups

The data in table 9 revealed the test results on the significant differences between the groups' post-test performances. It used the t-value and p-value in presenting the significant value between them.

Table 9: Test of Significant Difference on the Post-test Performances of the Two Groups

Source of Difference	Mean	Standard Deviation	Mean Difference	Computed t- value	p-value	Decision	Result
Control	19.98	7.74	-2.73	-1.92	.061	Failed to reject H0	Not Significant
Experimental	22.71	6.73					
*significant at $p < 0.05$ (two-tailed)							

As presented in table 9, the control group ($\bar{x}$=19.98, sd = 7.74) and the experimental group ($\bar{x}$=22.71, sd = 6.73) had a mean difference of -2.73 with a computed t-value of -1.92 and p-value of .061, which implied that there was no significant difference between the groups' post-test scores; thus, it failed to reject the null hypothesis.

Furthermore, it was observed that the respondents' performances from pre-test to post-test had improved with mean differences of -0.91 and -2.73, respectively. It implied that even without providing the control group with supplemental videos, they still learned and understood the quadratic equation concepts. However, comparing their academic performances as presented in table 7 on the five

(5) performances level, the experimental group did moderately better than the control group.

The effectiveness of video lessons cannot be discounted, notably in this pandemic; aside from online teaching, it becomes a substitute to the face-to-face type of teaching as well. The traditional teaching method in the classroom has transcended in mobile phones in today's generation, where they can access video content any time and place as they wish [20].

Video integration in teaching and learning has existed for decades, and its usage has exponentially increased. Ignoring it is not an option; nowadays, it plays a considerable role in shaping new teaching methods that education is currently using, especially in this digital age [21]. The benefits of videos that the students can derive from are scheduling flexibility, pacing, and preventing them from attending a large and long lecture [22]. This kind of learning delivery makes sense in today's situation, not only during a pandemic but also in other calamities.

4.6 Test Of Significant Mean Gain Difference on the Pre-Test and Post-Test Scores between the Two Groups

The data in table 10 revealed the test results on the significant main gain difference between the groups' post-test and pre-test scores. It used the t-value and p-value in presenting the significant value between them.

Table 10: Test of Significant Mean Gain Difference on the Pre-test and Post-test scores between the two groups

Source of Difference	Mean Gain	Standard Deviation	Mean Gain Difference	Computed t- value	p-value	Decision	Result
Control	6.89	6.62	1.82	1.32	0.192	Failed to reject H0	Not Significant
Experimental	8.71	6.51					
*significant at $p < 0.05$ (two-tailed)							

As presented in table 10, the control group ($\bar{x}$=16.89, sd = 6.62) and the experimental group ($\bar{x}$=8.71, sd = 6.51) had a mean gain difference of 1.82 with a computed t-value of 1.32 and p-value of .192, which implied that there was no significant main gain difference between the groups' pre-test and post-test scores; thus, it failed to reject the null hypothesis.

It showed that both modules or the self-learning kit and modules supplemented with video lessons had similar impact on the students' academic performance. A well-designed module makes learning effective. It should be competency-based; the contents must be clear and can be understood independently [23]. If those criteria are met, it is expected that students' critical thinking will improve; moreover, perform better academically [24]. On the other hand, a video lesson is a supplementary learning material for the traditional teaching methodologies and offers flexible learning to students [25]. Both learning materials are vital in teaching, which aims to enhance students' academic performance [26].

5. Discussion

Most Grade 9 level respondents were at the right age, with 87.78 percent belonging to the 13 - 15 age group wherein the majority were females, which comprised 63.33 percent. Almost three-fourths or 73.33 percent belonged to the poor-income group within the combined family income of ₱10,000 and below.

In terms of internet accessibility, mobile data was their primary source, and the prevalent device used in the household was the smartphone such that they got the first rank respectively. Regarding their academic performance levels in the pre-tests between the experimental and control groups, both performed poorly and fared almost equally with respective average scores of 14.00 and 13.09.

In the post-tests, their average scores were 22.71 and 19.98, respectively. Both ascended to just one step level in the fairly satisfactory. However, looking closely at the experimental group's performance level, few respondents did poorly, and more did slightly better in the fairly satisfactory and satisfactory levels than the control group. Both groups reached the very satisfactory level but none in the outstanding.

Comparing the two groups' academic performances, they revealed that there were no significant differences in both pre-tests and post-tests. Similarly, there was no significant main gain difference in the pre-test and post-test between the two groups. It implied that students who used both modules and supplemental video lessons (experimental group), as well as those who solely used modules (control group), had similar academic performances.

Based on the findings, students who only used modules and those who used modules with supplemental videos in studying quadratic equations had learned about the lessons. Both groups had similar academic performances within the fairly satisfactory level. However, the experimental group was slightly better than the control group, with general averages of 22.71 and 19.98, respectively. Based on the results, video lessons reinforced learning and made concepts more understandable to students.

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