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VIDEO LECTURES AS SUPPLEMENTAL MATERIALS IN UPGRADING REASONING SKILLS IN GEOMETRY OF GRADE 9 STUDENTS AT CALAMBA CITY SCIENCE INTEGRATED SCHOOL

[1]Shielalyn B. Incien, [2]Merilyn P. Juacalla, [3]Virgil C. Incien,

[4]Marinel A. Degoma

ABSTRACT

This research aims to learn more about how recorded video lectures, used as supplemental learning material, improve the reasoning capabilities of Geometry students in grade 9. Students are offered video lectures via synchronous and asynchronous learning to make up for the lack of face-to-face lessons. In Mathematics, the use of instructional material is critical since it helps improve problem-solving techniques. Geometry, a branch of Algebra, has been shown to improve one's mathematical aptitude and analytical skills in order to handle complicated issues by filtering through relevant information and detecting patterns of circumstances, depending on the level of experience of the pupils. Such important information necessitates precise and individualized learning to cater to a specific group of students, as well as an examination of the cognitive load of these video lectures. As a result, this research focuses on the content and quality of video lectures, as well as their impact on student learning through the use of pre- and post-tests.

In order to determine the effectiveness of the video lecture, the researcher used the descriptive approach. The researcher will employ two questionnaires: one that examines reasoning skills involvement through post and pre assessments, and another that deals with the mathematics learning experience in the video lecture. Depending on the researcher's study history, both instruments are altered and updated. The participants in the study were 30 Calamba City Science Integrated School grade 9 pupils. They were picked specifically because they are the only ones who can meet the study's aims and objectives.

The quantity of the video lectures' cognitive load in terms of intrinsic, germane, and extraneous; the quality of the video lectures in terms of engaging voice, pacing, and distraction control; and the students' performance in pre and post exams were all determined using mean and standard deviation. The spearman rho was used to investigate the relationship between video cognitive load and video course quality. Finally, the difference between the pretest and posttest findings on the reasoning skills evaluation was determined using paired t-test.

Using the information gathered, The intrinsic and germane cognitive loads of videos were consistently recognized, with an overall mean of 4.45 and 4.60, respectively. The extraneous was not identified at all, with an overall mean of 1.28. In terms of engaging voice, tempo, and distraction control, the average video lecture quality score was 4.33, 4.53, and 4.34, respectively. The superfluous load of an engaging voice in a video lecture is strongly related to its intrinsic and relevant loads, but not the other way around. Pacing in a video lecture, on the other hand, is strongly related to the germane and extraneous loads, but not to the intrinsic load. Finally, distraction management has no significant relation with intrinsic load in the video lesson, but it does have significant connections with germane and extraneous loads. Students did decently in the pre-test with a mean of 2.309 and well in the post-test with a mean of 1.768 in terms of analyzing, generalizing, and justifying. The difference between the students' pre- and post-test results in terms of the three competencies was found to be significant, with $t(29) = -8.873$, p 0.05. As a result, the kids did well on the pre-test and outstandingly well on the post-test.

As a result of the research, There is a significant correlation between the video lesson's assessed quality and the cognitive load of videos. Between the pretest and posttest scores, there is a significant difference in reasoning skills assessment performance.

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INTRODUCTION

This study sought to advance knowledge about how recorded video lectures, specifically as supplementary learning material, are affecting the reasoning skills of grade 9 students in Geometry subject. In recent months, the Department of Education (DepEd) has invested considerable resources toward training teachers and providing materials to integrate the needs of children in the new school system in the rise of a pandemic. Additionally, DepEd has released learning modalities that aim to provide a learning environment for all students, acknowledging that each individual has different ways of learning and limited resources due to the implemented safety protocols.

Through synchronous and asynchronous learning, students are given video lectures to suffice the lack of face-to-face classes. The use of instructional media plays a vital role in Mathematics as it can provide enhanced problem-solving methods. Geometry, an important branch of Algebra, has been proven to increase one's mathematical ability and analytical skills to solve complex problems by filtering through the relevant information and identifying situations depending on students' expertise. Such significant information leads to the need for detailed and personalized learning to cater to a specific bracket of students and analyze the cognitive load of these video lectures to their reasoning abilities. Thus, this study focused on the content and quality of the video lectures and their impact on students' learning.

RESEARCH METHODOLOGY

Research Design

This Descriptive Correlational Study aims to investigate, explain, and comprehend Grade 9 students' Geometry Reasoning Skills and their Mathematics Learning Experiences using Educational Videos. The researchers chose this research approach because they wanted firsthand information from the respondents.

The researchers used the Descriptive Correlational design to define and quantify the degree of association between two or more variables (Creswell, 2012). These models have been expanded to include more complex interactions between variables. It also defines the naturally occurring relationships between variables.

The descriptive correlational approach is beneficial to researchers because of its flexibility; it can use either qualitative or quantitative data, or both, offering researchers more choices in terms of data collection instrument.

Respondent of the Study

The study's participants were Calamba City Science Integrated School Grade 9 students. Since everyone in the video has equal access, the researcher will use Simple Random Sampling to pick the study's respondents.

Random Sampling was a technique used to choose the sample members in which everyone in the population has equal chances of being included.

Research Instrument

Construction. The researcher used questionnaires that deal with the mathematics learning experience in educational videos, and another t Both instruments are adapted and updated depending on the researcher's research background.

I. Questionnaire for Assessing Video Lecture

Part 1. Demographic Profile. It deals with the basic information of the respondents of the study.

Part 2. Cognitive Load of the Videos. It refers to a review of how Mathematics content is shared in videos, taking into account intrinsic, germane, and extraneous loads.

Part 3. Engaging Elements of Videos. It describes how educational videos can engage learners in learning concepts based on the speaker's engaging speech, the pace of the learning material, the length of the clip, and the control of distractions.

II. Pre-Test and Post Test.

It checked the students' reasoning skills in Geometry, particularly in analyzing, generalizing and justifying.

Validation. The researcher applied the questionnaire to the thesis mentor and other panel members for further refinement and finalization to ensure its accuracy. The researcher also asked Master teachers and the head teacher at Calamba City Science Integrated School to validate the content.

Data Gathering Procedure

Conceptualization. The researcher's subject or definition was conceptualized and sent to the Dean's office after several consultations with her advisor. A panel of experts examined it to ensure that the content is of high quality. The panel's suggestions were considered before its intended implementation.

Implementation. After the approval from the principal and respondents, the researcher conducted the study by following the different procedure: First, the researcher performed a pre-assessment using Google Docs, followed by the uploading of video lectures, distribution of a questionnaire using Google Forms to determine the video's accuracy, and finally, the uploading of a post-assessment using Google Docs. The Google Classroom was used to store all of the papers, forms, and video lectures. Next, the

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researcher prepared a request letter for gathering data in the participant school in Calamba City Science Integrated School. The letter was given to the principals; then, the researcher gave another letter to the respondents to conduct the study.

Data Analysis. The researcher will collect all of the necessary data and compile all of the instruments. The researcher will summarize the data produced from the Google form and documents before passing it on to her statistician for analysis. After the statistician has given the findings, the researcher must prepare tables that will be evaluated to understand the study's main objective better.

Ethical Consideration. The researcher will ensure the confidentiality of the respondents' findings and details. The researcher and thesis mentor would have access to the survey questionnaire's findings. This paper will not contain the names of the respondents.

Statistical Treatment of Data

The data to be gathered in the study were treated based on the following statistical tools:

The mean and standard deviation were used to determine the learning environment that the students experienced based on cognitive load and engaging elements of the instructional videos and the reasoning skills in Geometry presented to the students.

The Spearman rho was used to determine the association between the cognitive load of videos and the quality of the video courses.

Paired two-sample means were used to determine the difference between the pre-test and post-test results on the reasoning skills evaluation.

RESULTS AND DISCUSSIONS

The reasearcher analyzes and interprets the data gathered that determined the relationship between the use of video lectures and the reasoning skills of Grade 9 students in Geometry.

The extent of the Cognitive Load of the Video Lecture

Table 1 shows the cognitive load of the lecture video in terms of intrinsic load.

Table 1. Cognitive Load of the Lecture Video in terms of Intrinsic Load

Indicators	Mean	S.D.	Verbal Interpretation
1. The video lecture is discussed systematically.	4.87	0.346	Always observed
2. The writing in the work-example video is legible.	4.77	0.504	Always observed
3. I had to scan my eyes back and forth between the text and the graphs/images in the videos I watched. **	2.93	1.081	Seldom observed
4. I have to watch some parts of the lecture again to understand it fully. **	2.73	1.285	Seldom observed
5. The video layout is well organized, clear, and uncluttered	4.67	0.661	Always observed
Overall Mean		***4.45***	***Always Observed***

Legend:

4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the intrinsic load was always observed as the video lecture was discussed systematically (M=4.87, SD=0.346), the writing was legible (M=4.77, SD=0.504), and the layout was well-organized, clear, and uncluttered (M=4.67, SD=0.661). Items that the students seldom observed were scanning the lecture video back and forth (M=2.93, SD=1.081) and re-watching it to understand the lesson(M=2.73, SD=1.285) fully. It means that the students need not re-watch and re-scan the video to understand the lesson fully. The degree of connection between critical parts of knowledge that should be considered in working memory at the same time is measured by the internal complexity of the learning materials in the lecture video (Sweller, 1994). Also, The internal complexity of the learning materials in the lecture video measures the degree of the link between essential elements of knowledge that should be considered in working memory at the same time.

The overall mean of 4.45 signifies that the students constantly observed the intrinsic load of the lecture video that makes them understand the lesson better and apply it in solving a math problem.

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Table 2 shows the cognitive load of the lecture video in terms of germane load.

Table 2. Cognitive Load of the Lecture Video in terms of Germane Load

Indicators	Mean	S.D.	Verbal Interpretation
1. The lecture in the video really enhanced my understanding of the topic.	4.83	0.461	Always observed
2. I understand the video lecture because it repeats important information several times to understand the lecture better.	4.63	0.615	Always observed
3. Video highlights key areas on the screen and explains for me to understand the lesson better.	4.83	0.379	Always observed
4. The lecture has flowcharts in presentations to explain complex concepts.	4.03	0.999	Often observed
5. It has many solved examples that help me understand the lesson.	4.67	0.479	Always observed
Overall Mean	***4.60***		***Always Observed***

***Legend**:*
4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the germane load was always observed as the video enhanced their understanding of the topic (M=4.83, SD=0.461), repeats important information several times (M=4.63, SD=0.615), highlight key areas on the screen and explain (M=4.83, SD=0.379) and has many solved examples (M=4.67, SD=0.479). An item that the students often observed was the flowchart which explains complex concepts. It indicates that the video lecture employs a constructive information handling strategy that aids learning. It provides the students with a long-term reservoir of knowledge or schema. The learning process is greatly accelerated as a result of this.

The overall mean of 4.60 indicates that students consistently noted the pertinent content of the lecture video, allowing them to understand the lesson better and apply it to a math problem.

Table 3 shows the cognitive load of the lecture video in terms of extraneous load.

Table 3. Cognitive Load of the Lecture Video in terms of Extraneous Load

Indicators	Mean	S.D.	Verbal Interpretation
1. The explanations during the lecture were very uncertain.	1.53	1.074	Not observed at all
2. Video background music is annoying.	1.13	0.434	Not observed at all
3. The explanations were full of indistinct language.	1.17	0.379	Not observed at all
4. The video used monotone that makes it boring to watch.	1.40	0.563	Not observed at all
5. Video used animation that makes it distracting.	1.17	0.461	Not observed at all
Overall Mean	***1.28***		***Not Observed at all***

***Legend**:*
4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the extraneous load was not observed at all in the video as the explanations during the lecture were very uncertain (M=1.53, SD=1.074), background music is annoying (M=1.13, SD=0.434), explanations were full of indistinct language (M=1.17, SD=0.379), used monotone

(M=1.40, SD=0.563) and animation was distracting (M=1.17, SD=0.461). This means that parts in the video lecture did not contribute to learning, schemata acquisition, or automation. Instead, it is mostly related to how information is presented and the instructional format, both of which can increase the user's overall cognitive load.

Students frequently acknowledged the lecture video's relevant content, helping them comprehend the lesson better and apply it to a math problem, as indicated by the overall mean of 1.28.

Quality of the Video Lecture

The students assessed the quality of the video lecture in terms of engaging voice, pacing, and control of distractions.

Table 4 shows the video lecture's quality in terms of engaging voice.

Table 4. Quality of the Video Lecture as to Engaging Voice

Indicators	Mean	S.D.	Verbal Interpretation
1. The tone of the voice used in the video is engaging	4.40	0.770	Always observed
2. Use a conversational, enthusiastic style to enhance engagement.	4.37	0.765	Always observed
3. The videos engage my attention and help me concentrate.	4.63	0.718	Always observed
4. Use monotone that makes it boring to watch and listen to.**	2.00	1.313	Rarely observed
5. Animation, effects, and lecture voice tone are effective and help me involved in learning.	4.23	0.898	Always observed
Overall Mean	***4.33***		***Always Observed***

Legend:

4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the quality of the video as pertains to the tone of voice used was always observed engagingly with (M=4.40, SD=0.770), has conversational, enthusiastic style with (M=4.37, SD=0.765), engaged attention for concentration with (M=4.63, SD=0.718), and the animation, effects and voice tone were very effective with (M=4.23, SD=0.898). Furthermore, the students rarely observed monotone sounds that made the video boring to watch and listen to (M=2.00, SD=1.313). These indicate that the film enthralled the students. The video lecture was effective in conveying and engaging the message to the audience.

As clearly stated in the overall mean of 4.33, students commonly praised the lecture video's engaging voice to understand the topic better and appreciate the video.

The quality of the video lecture as to pacing is shown in Table 5.

Table 5. Quality of the Video Lecture as to Pacing

Indicators	Mean	S.D.	Verbal Interpretation
1. It uses a simple to complex approach in presenting ideas, information, and examples throughout the video.	4.53	0.819	Always observed
2. I understand the video lecture because it repeats important information several times to understand better.	4.73	0.521	Always observed
3. The pace of the clip is good for learning.	4.67	0.547	Always observed
4. The lecture has flowcharts in presentations to explain complex concepts.	4.03	1.033	Often observed
5. It has examples that chunk information to understand the lesson gradually.	4.67	0.479	Always observed
Overall Mean	***4.53***		***Always Observed***

Legend:

4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the quality of the video as to pacing was always observed in the video as it used a simple to complex approach in presenting ideas, information and examples (M=4.53, SD=0.819), repetition of important information several times (M=4.73, SD=0.521), the pacing of the clip was good for learning (M=4.67, SD=0.547). Examples of chunk information to understand the lesson (M=4.67, SD=0.479). The students often observed the presence of flowcharts in the presentation (M=4.03, SD=1.033). This means that the lecture video is moving at the "just right" speed for students. In most cases, these mean that the lesson appears to be unfolding more swiftly. Students view any change as an indicator or marker that aids in determining the rate at which a lesson is progressing.

The video provides students the impression of speed, as seen by the overall mean of 4.53. The class appears to be moving along more rapidly, and the students' attention is being maintained.

Table 6 shows the video lecture's quality in terms of distraction control.

Table 6. Quality of the Video Lecture as to Control of Distractions

Indicators	Mean	S.D.	Verbal Interpretation
1. There were no behaviors/habits that would distract a student.	4.60	0.855	Always observed
2. I can work on my task while listening to the explanation of the teacher through video	4.20	0.925	Always observed
3. The use of video effects is not distracting for learning	4.53	0.900	Always observed
4. The use of animation is not distracting for learning;	4.47	0.973	Always observed
5. Background music used in the video help me to focus	3.90	1.155	Often observed
Overall Mean		***4.34***	***Always Observed***

Legend:

4.20 – 5.00 Always Observed
3.40 – 4.19 Often Observed
2.60 – 3.39 Seldom Observed
1.80 – 2.59 Rarely Observed
1.00 – 1.79 Not Observed at all

The students disclosed that the quality of the video as to control of distractions was always observed with no behaviors/habits that would distract the student (M=4.60, SD=0.855), students can work on their task while listening to the video (M=4.20, SD=0.925), video effects is not distracting (M=4.53, SD=0.900), and animation is not distracting (M=4.47, SD=0.973). The item which the students often observed is the background music that helps the students to focus (M=3.90, SD=1.155). This mean that the lecture video has attention management in the practice of controlling distractions. Better attention management leads to students' understanding.

The distractions in the video lecture were controlled, as seen by the overall mean of 4.34. It aids the students' comprehension of the lecture.

Relationship between the Assessed Quality of the Video Lecture and Cognitive Load Development

The association between video lecture quality and cognitive load development is shown in Table 7.

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Table 7. Relationship between the Assessed Quality of the Video Lecture and the Students' Performance on Reasoning Skill Assessment

Variables	Intrinsic Load			Germane Load			Extraneous Load		
	r	***p***	**Analysis**	***r***	***p***	**Analysis**	***r***	***p***	**Analysis**
Engaging Voice	0.159	0.401	NS	0.303	0.103	NS	-0.482	0.007	***S***
Pacing	0.239	0.203	NS	0.736	0.000	***S***	-0.399	0.029	***S***
Control of distraction	0.303	0.103	NS	0.575	0.001	***S***	-0.393	0.037	***S***

Legend:
$\pm 0.80 - \pm 1.00$ *Very strong*
$\pm 0.60 - \pm 0.79$ *Strong*
$\pm 0.40 - \pm 0.59$ *Moderate*
$\pm 0.20 - \pm 0.39$ *Weak*
$\pm 0.00 - \pm 0.19$ *Very weak*

Table 7 presents the obtained R-values and p-values for the video lecture's assessed quality, such as engaging voice, pacing, and control of distractions and student's performance on reason skills assessment in terms of intrinsic, germane, and extraneous loads.

The results of the Spearman correlation indicated that there was no significant relationship between the engaging voice in the video lecture and its intrinsic load (rs(28) = 0.159, p > .05). However, there is a very weak positive relationship between them. It means that the video's compelling voice and the students' working memory grow in response to one other, but the correlation is not very strong. It also demonstrates that there is no meaningful link between the two.

It is also revealed that there was no significant relationship between the pacing in the video lecture and its intrinsic load (rs(28) = 0.239, p > .05). However, there is a weak positive relationship between them. It means that the pacing of the video lecture and the students' working memory both increase in reaction to one another, but the relationship is not very strong. Furthermore, there is no significant link between the two.

Likewise, the results showed that there was no significant relationship between the control of distractions in the video lecture and its intrinsic load (rs(28) = 0.303, p > .05). However, there is a weak positive relationship between them. It means that the distraction management of the video lecture and the students' working memory both increase as a result of each other; however, the link is not very strong, and the association is not substantial.

Based on the results also, it is found that there was no significant relationship between the engaging voice in the video lecture and its germane load (rs(28) = 0.303, p > .05). However, there is a weak positive relationship between them. It means that the video's engaging voice and the students' long-term memory improve due to one other, though the link is not extremely strong. However, it also proves that there is no substantial connection between them.

On the other hand, it is revealed that there was a significant relationship between the pacing in the video lecture and its germane load (rs(28) = 0.736, p < .05). Moreover, there is a strong positive relationship between them. It means that the video lecture's pacing and the students' long-term memory improve in response to one another, and the association is very strong. Thus, the link between the two is also significant.

Similarly, it is indicated that there was a significant relationship between the control of distraction in the video lecture and its germane load (rs(28) = 0.575, p < .05). Besides, there is a moderate positive relationship between them. It means that the control of distraction in the video lecture and the students' long-term memory increase in tandem, with a modest relationship between both. The connection between the two is equally important.

Correspondingly, the result showed that there was a significant relationship between the engaging voice in the video lecture and its extraneous load (rs(28) = -0.482, p < .05). However, there is a moderate negative relationship between them. It suggests a slight correlation between improving the video's compelling voice and removing unneeded information. In addition, the two have a significant relationship.

It is also indicated that there was a significant relationship between the pacing in the video lecture and its extraneous load (rs(28) = -0.399,

$p < .05$). However, there is a weak negative relationship between them. It suggests that there is a slight correlation between improving the video's pacing and removing unneeded information. In addition, the two have a significant relationship.

Lastly, it is presented that there was a significant relationship between the control of distractions in the video lecture and its extraneous load ($rs(28) = -0.393$, $p < 05$). However, there is a weak negative relationship between them. It shows that reducing unnecessary information and enhancing the video's control of distractions have a shaky relationship. Furthermore, the two share a close association.

In sum, the engaging voice in the video lecture has no significant relationship with its intrinsic and germane loads; but has a significant relationship with its extraneous load. On the other hand, pacing in the video lecture has no significant relationship with its intrinsic load but has a significant relationship with its germane and extraneous loads. Finally, the control of distractions in the video lecture has no significant relationship with its intrinsic load but has significant relationships with its germane and extraneous loads.

Students' Reasoning Skill Performance

Pre and post-tests were used to evaluate the students' reasoning abilities.

Table 8 shows the students' pre-test reasoning abilities.

Skill	Lowest score	Highest score	Mean	Std. Dev.	Analysis
Analyzing	1	4	2.90	0.712	Satisfactory
Generalizing	1	5	3.07	0.980	Satisfactory
Justifying	1	4	2.70	0.915	Satisfactory
Total Score	3	12	8.67	2.309	Satisfactory

Legend:

4.20 – 5.00	*12.00 – 14.99*	*Excellent*
3.40 – 4.19	*9.00 – 11.99*	*Very Satisfactory*
2.60 – 3.39	*6.00 – 8.99*	*Satisfactory*
1.80 – 2.59	*3.00 – 5.99*	*Fair*
1.00 – 1.79	*1.00 – 2.99*	*Needs Improvement*

The students showed satisfactory performance in the pre-test in terms of analyzing skill (M=2.90, SD=0.712), generalizing skill (M=3.07, SD=0.980), and justifying skill (M=2.70, SD=0.915). Adding their performance scores in the three skills discloses satisfactory performance in the pre-test (M=8.67, SD=2.309). The standard deviation of 2.309 indicates a slightly wide spread of the students' scores in the pre-test.

This indicates that the students do not have a thorough understanding of the subject. However, the fact that the outcome is satisfactory suggests that the students have a prior understanding of the subject.

Skill	Lowest score	Highest score	Mean	Std. Dev.	Analysis
Analyzing	3	5	4.37	0.765	Excellent
Generalizing	4	5	4.67	0.480	Excellent
Justifying	3	5	4.30	0.837	Excellent
Total Score	10	15	13.33	1.768	Excellent

Legend:

4.20 – 5.00	*12.00 – 14.99*	*Excellent*
3.40 – 4.19	*9.00 – 11.99*	*Very Satisfactory*
2.60 – 3.39	*6.00 – 8.99*	*Satisfactory*
1.80 – 2.59	*3.00 – 5.99*	*Fair*
1.00 – 1.79	*1.00 – 2.99*	*Needs Improvement*

The students showed excellent performance in the post-test in terms of analyzing skill (M=4.37, SD=0.765), generalizing skill (M=4.67, SD=0.480), and justifying skill (M=4.30, SD=0.837). Adding their performance scores in the three skills discloses that they had excellent performance in the post-test (M=13.33, SD=1.768). The standard deviation of 1.768 indicates a slightly wide spread of the students' scores in the post-test.

This suggests that the students have a good grasp of the material. It also demonstrates that after watching the video, the students perform well.

Difference between the Pretest and Posttest Scores Performance on Reasoning Skills Assessment

The difference between the pre-test and post-test scores performance on reasoning skills assessment is presented in Table 10.

Table 10. Difference between the Pretest and Posttest Scores Performance on Reasoning Skills Assessment

Skill	Mean		Mean difference	t-value	p-value	Analysis
	Pre	Post				
Analyzing	2.90	4.37	1.47	-8.930	0.000	***Significant***
Generalizing	3.07	4.67	1.60	-7.538	0.000	***Significant***
Justifying	2.70	4.30	1.60	-7.020	0.000	***Significant***
Total Score	8.67	13.33	4.66	-8.873	0.000	***Significant***

Sig. ≤0.05, CV=2.045

Using an alpha level of .05, a dependent-samples t test was conducted to evaluate whether student-respondents' pre-test and post-test scores performance on reasoning skills assessment differed significantly using the video lectures in terms of analyzing, generalizing, and justifying skills. In Table 10, the results indicated that the students' average score in pre-test in terms of analyzing (M = 2.90, SD = 0.712) was significantly lower than their average score in post-test (M = 4.37, SD = 0.765), with $t(29) = -8.930$, $p < .05$. The results also revealed that the students' average score in pre-test in terms of generalizing (M = 3.07, SD = 0.980) was significantly lower than their average score in post-test (M = 4.67, SD = 0.480), with $t(29) = -7.538$, $p < .05$. The results also showed that the students' average score in pre-test in terms of justifying (M = 2.70, SD = 0.915) was significantly lower than their average score in post-test (M = 4.30, SD = 0.837), with $t(29) = -7.020$, $p < .05$. When the students' scores in the three skill assessment were summed up, it was also found that the difference was significant with $t(29) = –8.873$, $p < 0.05$.

With this, the students showed satisfactory performance in the pre-test and excellent performance in the post-test.

Based on these results, it can be concluded that there is a significant difference between the pre-test and post-test using the video lecture in terms of analyzing, generalizing, and justifying skills.

Because the video is quick and focused on learning goals, the student's skills improve. It employs audio and visual features to convey relevant information. In addition, rather than being redundant, the video lecture considers complementing elements. Use signaling to draw attention to key ideas or concepts. Finally, to increase interest, utilize a conversational, passionate tone.

These findings are particularly useful, according to Lange and Costley 2020, cited by Alraimi et al., 2015; Breslow et al., 2013; Kim et al., 2011, because of the increased accessibility of e-learning for learners in South Korea and around the world, as well as the fact that video lectures are specifically designed to meet the learning needs of a wide range of learners with varying characteristics. Researchers can acquire a deeper understanding of challenges that university students confront when engaging in video lectures by providing an account of the scope of various media delivery concerns and diverse online learner experiences with media delivery. This study not only points out these issues but also provides solutions and beneficial guidelines for instructors who want to improve the e-learning experience of their students. With the wealth of information available from various visual and auditory media, instructors should not back away from using them but should be aware that ineffective media delivery could lead to learning issues. This study highlights these challenges and offers answers and helpful advice for instructors looking to improve their students' e-learning experience. Instructors should not shy away from employing various visual and auditory media because of the wealth of knowledge accessible, but they should be mindful that inadequate media delivery might lead to learning challenges.

Understanding cognitive load theory, according to Ashman (Ashman, 2017), revolutionized his math teaching. It may also improve teacher instruction if used effectively, which is a crucial variable in the complex classroom situation.

CONCLUSION

In view of the findings, the study has drawn the following conclusion:

1. The assessed quality of the video lesson and the cognitive load of videos have a substantial link. The hypothesis that there is no significant association between video lecture quality and cognitive video load was rejected.

2. There is a substantial variation in the performance of reasoning skills assessment between the pre-test and post-test scores. The hypothesis that there is no significant difference in the performance of reasoning skills evaluation between pre-test and post-test scores was rejected.

RECOMMENDATIONS

In the light of the preceding findings and conclusions of this study, the following recommendations are offered:

The statistical findings of the study resulted in the following recommendations:

1. Video can be a useful approach for students to expand their learning experiences, especially during a pandemic when face-to-face classes are impossible.

2. To parents who work full-time and have little time to help their children in school. This study will also serve as a guide for the teachers as they respond to their questions.

3. This research will provide teachers with an alternative method of delivering courses. It can also be used as a remedial tool.

4. Future researchers can dig further into the issue and contribute to the effectiveness of video lectures.

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