

Utilization Of Animated Videos Using Edpuzzle Application in Teaching Earth and Space 9

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Abstract

Many teachers use video to instruct students, whether it's to adopt a distance learning modality or to solve problems during a pandemic situation. They also use it as supplementary material to make the lesson easy to understand. Online teachers provide recorded video discussions to keep those students who are losing interest in attending online classes updated with the lesson discussed. However, the teachers can't notice whether the students watched and understood the recorded video given to them or not. Creating animated videos using Edpuzzle is then chosen as an interesting alternative. The purpose of this study was to determine the acceptability of animated videos using Edpuzzle in teaching Earth & Space 9. So, the experimental design was used. And to select the number of respondents, simple random sampling was done. The respondents were Grade 9 Atlas and Apollo of Cabuyao Integrated National High School. Each section consisted of 40 students giving a total of 80 participants accounted in the study. Grade 9 Atlas (experimental group) utilized the animated videos using Edpuzzle while Grade 9 Apollo (control group) utilized the animated videos without using Edpuzzle. This study showcased some of the topics in Earth and Space specifically, volcanoes. The objectives and topics are similar in both groups but not in the use of Edpuzzle. They were given assessments needed to meet the objectives of the study. Analysis of data revealed that utilization of videos using Edpuzzle is better than the traditional ones. It can really increase the academic performance of the students. Furthermore, it can be quite beneficial to teachers in terms of ensuring that their students have viewed and comprehended the video/s they have provided.

Keywords: Animated video, Edpuzzle

1. INTRODUCTION

Teaching Science in the new normal is a bit tricky since it is such a wide subject to cover, yet it is fascinating because it explains everything beyond. One of the most difficult aspects that teachers, particularly online teachers, face during these trying times is making their lessons and discussions more interactive.

Interactive learning is a pedagogical method for course design and delivery that incorporates social networking and urban computing. Interactive learning has emerged as a result of the proliferation of digital technology and virtual communication, particularly among students. Since around the year 2000, students entering higher education institutions have expected interactive learning to be an important part of their education. For these students, using interactive technology in the classroom is as natural as using a pencil and paper was for previous generations.

The importance of media in education and learning cannot be overstated. The teacher will be provided with "gears" to engage students in the learning process if they use media in the teaching and learning process. Furthermore, media may be employed in situations where students are studying alone as well as when they are working in a group.

Information and Communications Technology (ICT) cannot be isolated from the use of media in teaching and learning. ICT has long been a component of the educational ecosystem. Furthermore, since the outbreak of the Covid-19 pandemic, ICT has demonstrated its effectiveness in education, particularly in the teaching and learning process.

Most educational institutions, particularly universities, have just two options for dealing with the pandemic: temporarily halt teaching and learning, or continue teaching remotely with ICT help. Many have chosen the second option of incorporating ICT into their teaching and learning processes.

In ICT-based teaching and learning processes, many different types of media are used. Google Classroom, Google Meet, and Zoom were among the most often used media in teaching and learning procedures during the Covid-19 epidemic. In addition, interactive games such as Bookwidgets, Kahoot, Mentee, Quizziz, Quizalize, and Wordwall are utilized to make a discussion more entertaining.

Unfortunately, some teachers are still not knowledgeable about technology mostly seasoned teachers, and as a result, they stick to the traditional materials that make the students feel bored. Boredom can arise when the use of media in teaching and learning processes is not varied; consequently, teachers must learn about and use a variety of media when teaching.

1.1 Statement of the Problem

The study aims to determine the acceptability of animated videos using Edpuzzle in teaching selected topics in Earth and Space to selected Grade 9 students of Cabuyao Integrated National High School, S.Y. 2021-2022.

Specifically, this study aims to answer the following:

- 1). What is the level of acceptability of animated videos in terms of:
 - 1.1 content;
 - 1.2 usability;
 - 1.3 design;
 - 1.4 coherency; and
 - 1.5 consistency?
2. What is the level of students' mean performance in the experimental and control groups in terms of:
 - 2.1 pretest; and
 - 2.2 posttest?
3. Is there a significant difference between the students' mean performance in the experimental and control groups in terms of:
 - 3.1 pretest; and
 - 3.2 posttest?

2. METHODOLOGY

2.1 Research Design

It is critical to comprehend the research design's aim before beginning the study. Research designs are "the specific procedure involved in the research process: data collecting, data analysis, and report writing," according to Creswell (2012: 20). In other words, the research design is how the researchers set up the settings for collecting data, interpreting the data, and writing up the findings of the study.

The researcher decided to utilize an **experimental design** in this study to determine the level of acceptability of the animated videos created with Edpuzzle in teaching Earth and Space 9. "An experimental design is a usual technique to undertaking quantitative research," writes Creswell (2012: 294). To put it another way, an experimental design is required to conduct quantitative research.

2.2 Respondents of the Study

The respondents were Grade 9 Atlas and Apollo of Cabuyao Integrated National High School. Each section consists of 40 students giving a total of 80 participants accounted in the study. Grade 9 Atlas (experimental group) utilized the animated videos with the use of Edpuzzle while Grade 9 Apollo (control group) utilized the animated videos without the use of Edpuzzle. This study showcased some of the topics in Earth and Space specifically, volcanoes. The objectives and topics were similar in both groups but not in the use of Edpuzzle.

2.3 Research Instrument

The study was conducted with the use of pre-test and post-test instruments created by the teacher-researcher. Each assessment contained 15 questions. Pretest-posttest designs are widely used in behavioral research, according to Rumrill & Dimitrov (2003), especially for comparing groups and assessing change as a result of experimental treatments. Both groups took pretests and posttests to see how effective the materials are in improving their performance.

2.4 Statistical Treatment

To determine the significant difference among variables and to test if the null hypotheses are rejected or accepted, the following statistical instruments are used:

1. **Standard deviation and mean** were used to find out the students' pretest and posttest performances with the use of animated videos using Edpuzzle.

2. **Paired T-test** for correlated means was utilized to find out the significant difference between the two sections' pre-test and post-test performances.

3. **Independent T-test** for finding out the significant difference between the two sections' post-test performances.

3. RESULTS AND DISCUSSION

This section shows the presentation of data, analysis, and interpretation on determining the acceptability of animated videos using Edpuzzle in teaching selected topics in Earth and Space.

Apart from instructional materials like modules, PowerPoint presentations, visual aids, etc., animated videos are considered learning materials that are being used to attain the desired learning competency for specific learning areas.

In this study, the animated videos were evaluated in terms of content, usability, design, coherency, and consistency.

Table 1. Level of Acceptability of the Animated Videos in terms of Content

Statement	Mean	SD	Remarks
1. The animated videos are clear and easy to understand.	4.87	0.34	Strongly Agree
2. The lesson objectives are specific and clearly stated.	4.80	0.48	Strongly Agree
3. The animated videos provide sufficient information on the topic.	4.82	0.43	Strongly Agree
4. The lessons are aligned with the MELCs and grade 9 materials and appropriate to grade level.	4.87	0.34	Strongly Agree
5. It is adequate to develop students' critical thinking skills.	4.77	0.46	Strongly Agree
6. The animated videos were embedded with different types of questions related directly to the lesson's objectives.	4.83	0.38	Strongly Agree
7. The questions included in the videos meet the lesson's learning objectives.	4.83	0.38	Strongly Agree
8. The words used in discussing the topic were comprehensible.	4.82	0.39	Strongly Agree
9. The questions embedded were coherent to the topic.	4.83	0.38	Strongly Agree
10. The animated videos provide learning with a clear order of information.	4.85	0.36	Strongly Agree

Overall Mean = 4.83

Standard Deviation = 0.39

Verbal Interpretation = Very High

SCALE RATING

4.21 - 5.00	Very High
3.41 - 4.20	High
2.61 - 3.40	Moderately Agree
1.81 - 2.60	Low
1.00 - 1.80	Very Low

Table 1 illustrates the level of acceptability of the animated videos in terms of content. Among the statements above, "The videos are clear and easy to understand" and "The lessons are aligned with the MELCs and grade 9 materials and appropriate to grade level" yielded the highest mean score (M=4.87, SD=0.34) and was remarked as Strongly Agree. This is followed by "The animated videos with Edpuzzle provide learning with a clear order of information" with a mean score (M=4.85, SD=0.36) and was also remarked as Strongly Agree. On the other hand, the statement "It is adequate to develop students' critical thinking skills" received the lowest mean score of responses with (M=4.77, SD=0.46) yet was also remarked Strongly Agree.

Overall, the acceptability of animated videos in terms of content attained a mean score of 4.83 and a standard deviation of 0.39 and was Very High among the respondents. This further means that the respondents strongly agree that the content of the animated videos conformed with its stated characteristics.

Table 2. Level of Acceptability of the Animated Videos in terms of Usability

STATEMENT	MEAN	SD	REMARKS
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1. The animated videos using Edpuzzle are accessible anytime at any place using the Edpuzzle application that can be installed on android phones or any laptops.	4.80	0.44	Strongly Agree
2. The animated videos using Edpuzzle are not just normal videos but video lessons.	4.83	0.38	Strongly Agree
3. The animated videos using Edpuzzle stimulate students' critical thinking skills because they have embedded questions.	4.80	0.44	Strongly Agree
4. The animated videos using Edpuzzle can be used as intervention tools for those students who are losing interest in attending online classes.	4.82	0.39	Strongly Agree
5. The animated videos using Edpuzzle facilitate the acquisition of knowledge through independent study.	4.87	0.34	Strongly Agree
6. The animated videos using Edpuzzle are easy to understand and can increase the student's academic performance.	4.82	0.39	Strongly Agree
7. The animated videos using Edpuzzle have no skip button therefore they can surely increase the student's mastery.	4.68	0.68	Strongly Agree
8. The animated videos using Edpuzzle can easily assign to students because the tool being used can be linked on google classroom.	4.78	0.45	Strongly Agree
9. The animated videos using Edpuzzle are more interesting and engaging than the normal ones.	4.72	0.56	Strongly Agree
10. The animated videos using Edpuzzle are helpful to teachers because they can monitor easily whether the students watched the videos or not and understand them well.	4.78	0.45	Strongly Agree

Overall Mean = 4.79

Standard Deviation = 0.46

Verbal Interpretation = Very High

SCALE RATING

4.21 - 5.00	Very High
3.41 - 4.20	High
2.61 - 3.40	Moderately Agree
1.81 - 2.60	Low
1.00 - 1.80	Very Low

Table 2 illustrates the level of acceptability of animated videos in terms of usability. Among the statements above, "The animated videos with Edpuzzle facilitate the acquisition of knowledge through independent study" yielded the highest mean score ($M=4.87$, $SD=0.34$) and was remarked as Strongly Agree. This is followed by "The contextualized and localized videos with Edpuzzle are not just normal videos but video lessons" with a mean score ($M=4.83$, $SD=0.38$) and was also remarked as Strongly Agree. On the other hand, the statement "The contextualized and localized videos with Edpuzzle have no skip button, therefore, they can surely increase the student's mastery" received the lowest mean score of responses with ($M=4.68$, $SD=0.68$) yet was also remarked Strongly Agree.

Overall, the acceptability of animated videos in terms of usability attained a mean score of 4.79 and a standard deviation of 0.46 and was Very High among the respondents. This further means that the respondents strongly agree that the usability of the animated videos conformed with its stated characteristics.

Table 3. Level of Acceptability of the Animated Videos in terms of Design

STATEMENT	MEAN	SD	REMARKS
1. The provided animated videos have appropriate clips, graphics, and images.	4.78	0.49	Strongly Agree
2. It contains readable texts.	4.78	0.45	Strongly Agree
3. It has different types of questions inserted along with the videos.	4.82	0.39	Strongly Agree
4. It is attractive and informative.	4.80	0.44	Strongly Agree
5. It has appropriate structure, style, and format to the target level.	4.78	0.45	Strongly Agree
6. The topics fit well in the video and are presented in a coherent and ordered sequence.	4.82	0.43	Strongly Agree
7. The designs could aid the learners in comprehending the topic.	4.80	0.44	Strongly Agree
8. The sound and visual effects arouse the student's interest.	4.75	0.47	Strongly Agree
9. The video's audio is loud and clear.	4.83	0.38	Strongly Agree
10. Its illustrations are relevant to the topic.	4.85	0.36	Strongly Agree

Overall Mean = 4.80**Standard Deviation = 0.43****Verbal Interpretation = Very High****SCALE RATING**

4.21 - 5.00	Very High
3.41 - 4.20	High
2.61 - 3.40	Moderately Agree
1.81 - 2.60	Low
1.00 - 1.80	Very Low

Table 3 illustrates the level of acceptability of the animated videos in terms of design. Among the statements above, "Its illustrations are relevant to the topic" yielded the highest mean score ($M=4.85$, $SD=0.36$) and was remarked as Strongly Agree. This is followed by "The video's audio is loud and clear" with a mean score ($M=4.83$, $SD=0.38$) and was also remarked as Strongly Agree. On the other hand, the statement "The sound and visual effects arouse the student's interest" received the lowest mean score of responses with ($M=4.75$, $SD=0.47$) yet was also remarked Strongly Agree.

Overall, the level of acceptability of the animated videos in terms of design attained a mean score of 4.80 and a standard deviation of 0.43 and was Very High among the respondents. This further means that the respondents strongly agree that the design of the animated videos conformed with its stated characteristics.

Table 4. Level of Acceptability of the Animated Videos in terms of Coherency

STATEMENT	MEAN	SD	REMARKS
1. It makes abstract concepts clear.	4.78	0.45	Strongly Agree
2. It promotes the systemic connection of ideas.	4.75	0.44	Strongly Agree
3. It presents the information in a clear, understandable manner, and aids in the reduction of cognitive load.	4.83	0.38	Strongly Agree
4. It promotes the logical arrangement of information.	4.82	0.39	Strongly Agree
5. It lessens the student's chance of becoming confused, disorganized, or frustrated.	4.77	0.43	Strongly Agree
6. It helps students to remember what they've learned and why they're learning it.	4.72	0.52	Strongly Agree
7. It helps with retention and recall.	4.80	0.44	Strongly Agree
8. It has a clear progression of thought from one idea to another.	4.78	0.45	Strongly Agree
9. It provides meaningful information about the topic.	4.85	0.36	Strongly Agree
10. It contains texts, images, and narrations for a better understanding of the lessons.	4.83	0.38	Strongly Agree

Overall Mean = 4.79**Standard Deviation = 0.43****Verbal Interpretation = Very High****SCALE RATING**

4.21 - 5.00	Very High
3.41 - 4.20	High
2.61 - 3.40	Moderately Agree
1.81 - 2.60	Low
1.00 - 1.80	Very Low

Table 4 illustrates the level of acceptability of the animated videos in terms of coherency. Among the statements above, "It provides meaningful information about the topic" yielded the highest mean score ($M=4.85$, $SD=0.36$) and was remarked as Strongly Agree. This is followed by "It presents the information in a clear, understandable manner, and aid in the reduction of cognitive load" and "It contains texts, images, and narrations for a better understanding of the lessons" with a mean score ($M=4.83$, $SD=0.38$) and were also remarked as Strongly Agree. On the other hand, the statement "It helps students to remember what they've learned and why they're learning it" received the lowest mean score of responses with ($M=4.72$, $SD=0.52$) yet was also remarked Strongly Agree.

Overall, the level of acceptability of the animated videos in terms of coherency attained a mean score of 4.79 and a standard deviation of 0.43 and was Very High among the respondents. This further means that the respondents strongly agreed that the coherency of the videos conformed with its stated characteristics.

Table 5. Level of Acceptability of the Animated Videos in terms of Consistency

STATEMENT	MEAN	SD	REMARKS
1. The tone of the voice used is consistent throughout the videos.	4.82	0.39	Strongly Agree
2. The topics focused mainly on volcanoes.	4.80	0.40	Strongly Agree
3. The objects/tools/materials used in the videos are similar to each other.	4.75	0.47	Strongly Agree
4. The objectives were presented at the beginning of the lesson.	4.80	0.40	Strongly Agree
5. The resolution of the videos is clear.	4.75	0.47	Strongly Agree
6. The speed of the narrations in the video was enough to follow and understand the lesson properly.	4.75	0.47	Strongly Agree
7. The examples given in the videos were easy to remember because they will not exceed five.	4.80	0.40	Strongly Agree
8. There is a short recapitulation given before the continuation of the lesson.	4.78	0.42	Strongly Agree
9. The materials used in the videos are present in the community.	4.82	0.39	Strongly Agree
10. The length of the videos is sufficient and does not take more than eight minutes.	4.82	0.39	Strongly Agree

Overall Mean = 4.79

Standard Deviation = 0.42

Verbal Interpretation = Very High

SCALE RATING

4.21 - 5.00	Very High
3.41 - 4.20	High
2.61 - 3.40	Moderately Agree
1.81 - 2.60	Low
1.00 - 1.80	Very Low

Table 5 illustrates the level of acceptability of the animated videos in terms of consistency. Among the statements above, "The tone of the voice used is consistent throughout the videos", "The materials used in the videos are present in the community", and "The length of the videos is sufficient and does not take more than eight minutes" yielded the highest mean score ($M=4.82$, $SD=0.39$) and were remarked as Strongly Agree. This is followed by "The topics focused mainly on volcanoes", "The objectives were presented at the beginning of the lesson" and "The examples given in the videos were easy to remember because they will not exceed five" with a mean score ($M=4.80$, $SD=0.40$) and were also remarked as Strongly Agree. On the other hand, the statements "The objects/tools/materials used in the videos are similar to each other", "The resolution of the videos is clear", and "The speed of the narrations in the video was enough to follow and understand the lesson properly" received the lowest mean score of responses with ($M=4.75$, $SD=0.47$) yet were also remarked Strongly Agree.

Overall, the level of acceptability of the animated videos in terms of consistency attained a mean score of 4.79 and a standard deviation of 0.42 and was Very High among the respondents. This further means that the respondents strongly agreed that the consistency of the videos conformed with its stated characteristics.

Table 6. Students' Mean Performance in Controlled Group in terms of Pretest and Posttest

Score	Pre Test		Post Test		Remarks
	Frequency	Percentage	Frequency	Percentage	
13-15	1	2.50	31	77.50	Outstanding
10-12	30	75.00	9	22.50	Very Satisfactory
7-9	9	22.50	0	0.00	Satisfactory
4-6	0	0.00	0	0.00	Fairly Satisfactory
0-3	0	0.00	0	0.00	Did Not Meet Expectations
Total	40	100.00	40	100.00	
Overall Mean	10.26		13.28		

Standard	1.24	1.36
Deviation	Very Satisfactory	Outstanding
Verbal		
Interpretation		

Table 6 presents the student's mean performance in the controlled group in terms of pretest and posttest.

In terms of the pre-test, the majority of the respondents 75% of the population scored an average of 10 to 12 points across the three videos, which is remarked as very satisfactory. This is followed in frequency by those who scored 7 to 9 points on average with nine (9) students scoring as such. On the other hand, only one (1) respondent scored between 13 to 15 points.

In contrast, the students predominantly scored between 13 to 15 points on average with thirty-one (31) students in the post-test which is remarked as outstanding. The remaining nine (9) were able to score between 10 to 12 points and were remarked as very satisfactory.

Overall, the student's mean performance in the controlled group in terms of the pre-test were very satisfactory, with a mean score of 10.26 over 15 and a standard deviation of 1.24. In comparison, the student's performance on the post-test was on an outstanding level with a mean score of 13.28 out of 15 and a standard deviation of 1.36.

Table 7. Students' Mean Performance in Experimental Group in terms of Pretest and Posttest

Score	Pre Test		Post Test		Remarks
	Frequency	Percentage	Frequency	Percentage	
13-15	3	7.50	34	85.00	Outstanding
10-12	24	60.00	5	12.50	Very Satisfactory
7-9	12	30.00	1	2.50	Satisfactory
4-6	1	2.50	0	0.00	Fairly Satisfactory
0-3	0	0.00	0	0.00	Did Not Meet Expectations
Total	40	100.00	40	100.00	
Overall Mean					
Standard	10.16		13.89		
Deviation	1.65		1.78		
Verbal	Very Satisfactory		Outstanding		
Interpretation					

Table 7 presents the student's mean performance in the experimental group in terms of pretest and posttest. In terms of the pre-test, the majority of the respondents 60% of the population scored an average of 10 to 12 points across the three videos, which is remarked as very satisfactory. This is followed in frequency by those who scored 7 to 9 points on average with twelve (12) students scoring as such. On the other hand, only one (1) respondent scored between 4 to 6 points which were fairly satisfactory.

In contrast, the students predominantly scored between 13 to 15 points on average with thirty-four (34) students in the post-test which is remarked as outstanding. Five (5) were able to score between 10 to 12 points and were remarked as very satisfactory, while one (1) student scored between 4 to 6 points.

Overall, the student's mean performance and mastery after watching the animated videos in terms of the pre-test were very satisfactory, with a mean score of 10.16 over 15 and a standard deviation of 1.65. In comparison, the student's performance on the post-test was on an outstanding level with a mean score of 13.89 out of 15 and a standard deviation of 1.78.

Based on the result above, when compared to traditional videos, using Edpuzzle is better since it can not only make the video interactive but also improve students' academic performance and mastery. Furthermore, it can be quite beneficial to teachers in terms of ensuring that their students have viewed and comprehended the video/s they have provided.

Table 8. Significant Difference Between the Students' Mean Performance in Controlled Group in terms of Pretest and Posttest

Performance	Mean	Variance	t Statistic	Critical t	P-value	Analysis
Pre-Test	10.26	1.55	-14.05	1.68	0.000	Significant
Post Test	13.28	1.85				

Table 8 presents the significant difference between the students' pre-test and post-test performance after watching the contextualized and localized videos in earth and space without using Edpuzzle.

There is a significant difference observed between the Pre-Test (10.26) and Post Test (13.28) as evidenced by the computed t-statistic of -14.05 which is beyond the critical value of 1.68. Also, a computed p-value of 0.000 is significantly less than the 0.05 alpha for significance, hence the test result.

Thus, at a 0.05 level of significance, the null hypothesis "There is no significant difference between the students' pre-test and post-test performance after watching the animated videos in earth and space without using Edpuzzle" is rejected. This calls for the acceptance of the alternative which incites a significant difference.

Based on the analysis above, it was evidently shown that there was a significant difference between the pretest and posttest performances after watching the contextualized and localized videos without Edpuzzle. This means that the students learned from the videos they watched.

Table 9. Significant Difference Between the Students' Mean Performance in Experimental Group in terms of Pretest and Posttest

Performance	Mean	Variance	t Statistic	Critical t	P-value	Analysis
Pre-Test	10.16	2.72	-12.81	1.68	0.000	Significant
Post Test	13.89	3.17				

Table 9 presents the significant difference between the students' mean performance in the experimental group in terms of pretest and posttest.

There is a significant difference observed between the Pre-Test (10.16) and Post Test (13.89) as evidenced by the computed t-statistic of -12.81 which is beyond the critical value of 1.68. Also, a computed p-value of 0.000 is significantly less than the 0.05 alpha for significance, hence the test result.

Thus, at a 0.05 level of significance, the null hypothesis "There is no significant difference between the students' pre-test and posttest performance after watching the animated videos using Edpuzzle" is rejected. This calls for the acceptance of the alternative which incites a significant difference.

Based on the results of the above analysis, there was a significant difference between the pretest and posttest performances after watching the animated videos using Edpuzzle. This means that the tool is beneficial not just to teachers in terms of ensuring that students have viewed and comprehended the videos they have provided, but also to students in terms of allowing them to interact and facilitate learning independently through the videos.

Table 10. Significant Difference Between the Students' Mean Performance in Both Group After Watching the Animated Videos with and without the Use of Edpuzzle

Performance	Mean	Variance	t Statistic	Critical t	P-value	Analysis
With Edpuzzle	13.28	1.85	-1.91	1.68	0.032	Significant
Without Edpuzzle	13.89	3.17				

Table 10 presents the significant difference between the students' mean performance in both group after watching the animated videos with and without the use of Edpuzzle.

There is a significant difference observed between the with Edpuzzle (13.28) and without Edpuzzle (13.89) as evidenced by the computed t-statistic of -1.91 which is beyond the critical value of 1.68. Also, a computed p-value of 0.032 is significantly less than the 0.05 alpha for significance, hence the test result.

Thus, at a 0.05 level of significance, the null hypothesis "There is no significant difference between the students' pretest and posttest performances after watching the animated videos with and without using Edpuzzle" is rejected. This calls for the acceptance of the alternative which incites a significant difference between the two.

The result of the analysis above revealed that both the animated videos with and without using Edpuzzle were significant however, students who used videos with Edpuzzle performed better.

4. CONCLUSION AND RECOMMENDATION

Since the Animated Videos using Edpuzzle in Teaching Earth and Space 9 were found to be effective as manifested in the results abovementioned, the following recommendations were hereby given:

1. All teachers are encouraged to develop their own video/s and use the Edpuzzle tool to make them interactive, not just Science teachers.
2. Schools and districts should provide support to teachers by purchasing orders to unlock unlimited storage in Edpuzzle and become more productive in teaching.
3. Administrators may conduct seminars or workshops that would train teachers on how to contextualize and localize their lessons that would apply in the teaching-learning process during science class. Moreover, on how to use Edpuzzle.

5. Future researchers may conduct similar studies further to test the acceptability of videos using Edpuzzle using a bigger sample, other grade levels, and other fields of science to verify the results of this study.

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6. REFERENCES

- Adam, M., Chen, S. F., Amieva, M., Deitz, J., Jang, H., Porwal, A., & Prober, C. (2017). The Use of Short, Animated, Patient-Centered Springboard Videos to Underscore the Clinical Relevance of Preclinical Medical Student Education. *Academic Medicine*, 92(7), 961–965. <https://doi.org/10.1097/acm.0000000000001574>
- Anderson, A., Furlonger, B., Moore, D. W., Sullivan, V. D., & White, M. P. (2018). A comparison of video modelling techniques to enhance social-communication skills of elementary school children. *International Journal of Educational Research*, 87, 100–109. <https://doi.org/10.1016/j.ijer.2016.05.016>
- Andujar, A., Salaberri-Ramiro, M. S., & Martínez, M. S. C. (2020). Integrating Flipped Foreign Language Learning through Mobile Devices: Technology Acceptance and Flipped Learning Experience. *Sustainability*, 12(3), 1110. <https://doi.org/10.3390/su12031110>
- Arkan, G. (2009). Image-to-Print Graphic Design. Konya Eitim Academic Publications. - References - Scientific Research Publishing. (2021). Scirp.org. [https://www.scirp.org/\(S\(lz5mqp453edsnp55rrgjct55.\)\)/reference/referencespapers.aspx?referenceid=2959423](https://www.scirp.org/(S(lz5mqp453edsnp55rrgjct55.))/reference/referencespapers.aspx?referenceid=2959423)
- Bassford, M., Crisp, A., O'Sullivan, A., & Fowler, M. (2016, September 20). CrashEd – A live immersive, learning experience embedding STEM subjects in a realistic, interactive crime... ResearchGate; Co-Action Publishing. https://www.researchgate.net/publication/308387044_CrashEd_-_A_live_immersive_learning_experience_embedding_STEM_subjects_in_a_realistic_interactive_crime_scene
- Berry, T. (2008). Pre-Test Assessment. *American Journal of Business Education (AJBE)*, 1(1), 19–22. <https://doi.org/10.19030/ajbe.v1i1.4633>
- Bovy, R. C. (2022). Successful Instructional Methods: A Cognitive Information Processing Approach. ECTJ/ERIC-IR Young Scholar Paper. *Educational Communication and Technology: A Journal of Theory, Research, and Development*, 29(4), 203–217. <https://eric.ed.gov/?id=EJ256747>
- Brame, C. J. (2016). Effective educational videos: Principles and guidelines for maximizing student learning from video content, 1–6. <https://doi.org/10.1187/cbe.16-03-0125>
- Bruning, I. L. (2013). An information processing approach to a theory of instruction. *ECTJ*, 31(2), 91–101. <https://doi.org/10.1007/bf02766725>
- Chaytor JL, Al Mughalaq M, Butler H. (2017). Development and use of online Prelaboratory activities in organic chemistry to improve students' laboratory experience. *J Chem Educ.* 2017;94(7): 859–66. <https://doi.org/10.1021/acs.jchemed.6b00850>

- Constructivism: teaching for understanding of the Internet: Communications of the ACM: Vol 40, No 10. (2022). Communications of the ACM. <https://dl.acm.org/doi/10.1145/262793.262814>
- Costa, A. C. da, Silva, B. G. da, Borges, Y. M., & Marques, C. (2021). The use of digital videos in Edpuzzle and its influence on the performance of Accounting students at a brazilian public institution. *Research, Society and Development*, 10(5), e9010514561. <https://doi.org/10.33448/rsd-v10i5.14561>
- Costa, A. C. da, Silva, B. G. da, Borges, Y. M., & Marques, C. (2021). The use of digital videos in Edpuzzle and its influence on the performance of Accounting students at a brazilian public institution. *Research, Society and Development*, 10(5), e9010514561. <https://doi.org/10.33448/rsd-v10i5.14561>
- Costa, A.L, & Kallick, B. (2022). *Assessment Strategies for Self-Directed Learning*. (2022, May 5). Corwin. <https://us.corwin.com/en-us/nam/book/assessment-strategies-self-directed-learning>
- Cross, K., Patricia, & Angelo, T. (n.d.). <https://files.eric.ed.gov/fulltext/ED317097.pdf>
- Dease, A. (2012). Contextual teaching and learning theory. Retrieved on August 14, 2014 from http://www.sdcu.com/define_contextual_876/pdf.
- Dictionary.com. ^ "the definition of content". Archived from the original on 8 March 2016. Retrieved 3 May 2018.
- Dimitrov, D., & Rumrill, P. (2003). Speaking of Research Pretest-posttest designs and measurement of change. *Work*, 20, 159–165. https://cehd.gmu.edu/assets/docs/faculty_publications/dimitrov/file5.pdf
- Edpuzzle [Internet]. Edpuzzle: About us [cited 1 Jan 2021]. Available from: <https://edpuzzle.com/about>.
- Edpuzzle [Internet]. Edpuzzle: make any video of your lesson [cited 1 Jan 2021]. Available from: <https://edpuzzle.com/pricing>.
- Edpuzzle [Internet]. Edpuzzle: Privacy policy [cited 1 Jan 2021]. Available from: <https://edpuzzle.com/privacy>.
- Garrison, D. R. (2013). Self-Directed Learning Toward a Comprehensive Model. *Adult Education Quarterly*, 48, 18-33. - References - Scientific Research Publishing. (2015). Scirp.org. <https://scirp.org/reference/referencespapers.aspx?referenceid=1480080>
- Graham, K. (2016). *TechMatters: Let's Get Interactive, (Videos That Is), with EdPuzzle and Vialogues*.
- DigitalCommons@EMU. <https://commons.emich.edu/loexquarterly/vol43/iss1/3/>
- Günay, M. (2021). Design in Visual Communication. *Art and Design Review*, 09(02), 109–122. <https://doi.org/10.4236/adr.2021.92010>
- Hwang, G.-J., & Chen, P.-Y. (2022). Interweaving gaming and educational technologies: Clustering and forecasting the trends of game-based learning research by bibliometric and visual analysis. *Entertainment Computing*, 40, 100459. <https://doi.org/10.1016/j.entcom.2021.100459>
- Hwang, G.-J., Chang, S.-C., Chen, P.-Y., & Chen, X.-Y. (2017). Effects of integrating an active learning-promoting mechanism into location-based real-world learning environments on students' learning performances and behaviors. *Educational Technology Research and Development*, 66(2), 451–474. <https://doi.org/10.1007/s11423-017-9567-5>
- Karaca, C., Mehmet, A., & Ocak. (2017). Effect of Flipped Learning on Cognitive Load: A Higher Education Research. *Journal of Learning and Teaching in Digital Age*, 2(1), 20–27. <https://dergipark.org.tr/en/download/article-file/1175587>
- Kaushal Kumar Bhagat, Cheng Nan Chang, & Chun Yen Chang. (2016). The impact of the flipped classroom on mathematics concept learning in high school. *Educational Technology and Society*, 19(3), 134–142. <https://scholar.lib.ntnu.edu.tw/en/publications/the-impact-of-the-flipped-classroom-on-mathematics-concept-learn-2>

- Kay, R., & Dermott, K. (2019). Flipped vs. Traditional Classrooms in High School Chemistry: A Case for Emphasizing Quality of Implementation. *Learntechlib.org*, 2299–2305. <https://www.learntechlib.org/p/207969/>
- Kelly, R. M., & Jones, L. L. (2007). Exploring How Different Features of Animations of Sodium Chloride Dissolution Affect Students' Explanations. *Journal of Science Education and Technology*, 16(5), 413–429. <https://doi.org/10.1007/s10956-007-9065-3>
- Kelly, R. M., & Jones, L. L. (2007). Exploring How Different Features of Animations of Sodium Chloride Dissolution Affect Students' Explanations. *Journal of Science Education and Technology*, 16(5), 413–429. <https://doi.org/10.1007/s10956-007-9065-3>
- Knowles, M. (2012). *SELF-DIRECTED LEARNING: A GUIDE FOR LEARNERS AND TEACHERS* Malcolm m Knowles New York: Association Press, 1975. 135 pp., paperbound. *Group & Organization Management*, 2(2), 256–257. <https://doi.org/10.1177/105960117700200220>
- Leidner, D. E., & Jarvenpaa, S. L. (1995, September). The Use of Information Technology to Enhance Management School Education: A Theoretical View. *ResearchGate*; University of Minnesota, Management Information Systems Research Center. https://www.researchgate.net/publication/44819841_The_Use_of_Information_Technology_to_Enhance_Management_School_Education_A_Theoretical_View
- Long, H. B., & And Others. (2022). Self-Directed Learning: Emerging Theory & Practice. In Ed.gov. Oklahoma Research Center for Continuing Professional and Higher Education, McCarter Hall, University of Oklahoma, Norman, OK 73037 (\$14.95; quantity price \$13). <https://eric.ed.gov/?id=ED368916>
- Mather, R. (2015). A mixed-methods exploration of an environment for learning computer programming. *Research in Learning Technology*, 23. <https://doi.org/10.3402/rlt.v23.27179>
- Mather, R. (2015). A mixed-methods exploration of an environment for learning computer programming. *Research in Learning Technology*, 23. <https://doi.org/10.3402/rlt.v23.27179>
- Mayer, R. E., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist*, 38(1), 43–52. https://doi.org/10.1207/s15326985ep3801_6
- Mischel, L. J. (2018). Watch and Learn? Using Edpuzzle to Enhance the Use of Online Videos. *Management Teaching Review*, 4(3), 283–289. <https://doi.org/10.1177/2379298118773418>
- Navarro, E.M.M.: Creación de lecciones a partir de vídeos con EdPuzzle. In: Tele (in) 2. Nuevos enfoques en la aplicación práctica de la innovación docente, León, pp. 47–52 (2015). <https://doi.org/10.1007-978-3-319-95522-3>
- Nelson, K. G., McKenna, A. F., Brem, S. K., Hilpert, J., Husman, J., & Pettinato, E. (2017). Students' Misconceptions about Semiconductors and Use of Knowledge in Simulations. *Journal of Engineering Education*, 106(2), 218–244. <https://doi.org/10.1002/jee.20163>
- Nelson, K. G., McKenna, A. F., Brem, S. K., Hilpert, J., Husman, J., & Pettinato, E. (2017). Students' Misconceptions about Semiconductors and Use of Knowledge in Simulations. *Journal of Engineering Education*, 106(2), 218–244. <https://doi.org/10.1002/jee.20163>
- Odden, Lee (2013), "What is Content? Learn from 40+ Definitions" Archived 2014-02-25 at the Wayback Machine, TopRank Online Marketing Blog, Retrieved 2014-02-20
- Orcos, L. I., Pedro, T., Marta, Javier, F., & Alberto. (2018). Use of kahoot and EdPuzzle by smartphone in the classroom: the design of a methodological proposal. *Unir.net*. <https://doi.org/9783319955216>
- Ormrod, J. E. (2014). *Human learning*. Upper Saddle River, NJ: Pearson Education, Inc.

- Parsafar, S. & Tabatabaei, O. (2012). The Effect of Self-Directed Learning on Critical Thinking of Iranian EFL Learners. *Journal of Educational and Social Research*, 2(2), 55–55. <https://www.richtmann.org/journal/index.php/jesr/article/view/11808>
- Pueo, B., Jimenez-Olmedo, J. M., Penichet-Tomás, A., & Antonio. (2017). Aplicación de la herramienta Edpuzzle en entornos de aprendizaje individuales dentro del aula. *Rua.ua.es*. <https://doi.org/978-84-9921-935-6>
- Reiser & Dempsey, Trends and Issues in Instructional Design and Technology, 4th Edition | Pearson. (2018). *Pearson.com*. <https://www.pearson.com/us/higher-education/program/Reiser-Trends-and-Issues-in-Instructional-Design-and-Technology-4th-Edition/PGM107207.html>
- Sanger, M. J., Brecheisen, D. M., & Hynek, B. M. (2001). Can Computer Animations Affect College Biology Students' Conceptions about Diffusion & Osmosis? *The American Biology Teacher*, 63(2), 104–109. <https://doi.org/10.2307/4451051>
- Seery MK, O'Connor C. E-learning and blended learning in chemistry education. *Chemistry education*. Hoboken, NJ: John Wiley & Sons, Ltd; 2015. p. 651–70. <https://doi.org/10.1002/9783527679300.ch26>.
- SELF-DIRECTED LEARNING: A GUIDE FOR LEARNERS AND TEACHERS Malcolm Knowles New York: Association Press, 1975. 135 pp., paperbound. (1977). *Group & Organization Studies*, 2(2), 256–257. <https://doi.org/10.1177/105960117700200220>
- Shelby, S. J., & Fralish, Z. D. (2021). Using Edpuzzle to improve student experience and performance in the biochemistry laboratory. *Biochemistry and Molecular Biology Education*, 49(4), 529–534. <https://doi.org/10.1002/bmb.21494>
- Smith, K Tara (2011). "Needs Analysis: Or How Do You Capture, Represent, and Validate User Requirements in a Formal Manner/Notation before Design". In Karwowski, W.; Soares, M.M.; Stanton, N.A. (eds.). *Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques (Handbook of Human Factors in Consumer Product Design)*. CRC Press.
- Song, L., & Hill, J. R. (2007). A Conceptual Model for Understanding Self-Directed Learning in Online Environments. *Journal of Interactive Online Learning* *Www.ncolr.org/Jiol*, 6(1). <http://www.ncolr.org/jiol/issues/pdf/6.1.3.pdf>
- SoTL Commons Conference Program (2019). (2019). *Digital Commons@Georgia Southern*. <https://digitalcommons.georgiasouthern.edu/sotlcommons/SoTL/2019/101/>
- Sproull, N. (1973). Visual Attention, Modeling Behaviors, and Other Verbal and Nonverbal Meta-Communication of Prekindergarten Children Viewing Sesame Street. *American Educational Research Journal*, 10(2), 101–114. <https://doi.org/10.3102/00028312010002101>
- Tan, E., & Pearce, N. (2011). Open education videos in the classroom: exploring the opportunities and barriers to the use of YouTube in teaching introductory sociology. *Research in Learning Technology*, 19. <https://doi.org/10.3402/rlt.v19i3.7783>
- Tasker, R., & Dalton, R. (2008). Visualizing the Molecular World – Design, Evaluation, and Use of Animations. *ResearchGate*; https://www.researchgate.net/publication/227168919_Visualizing_the_Molecular_World_-_Design_Evaluation_and_Use_of_Animations unknown.
- Taslibeyaz, E., Aydemir, M. and Karaman, S. (2017), 'An analysis of research trends in articles on video usage in medical education', *Education and Information Technologies* 22(3), 873–881. Retrieved from <https://eric.ed.gov/?id=EJ1140522>
- Taylor, E. W. (2004). *The Theory and Practice of Transformative Learning: A Critical Review*. Information Series No. 374. Ed.gov; Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210-1090. <https://eric.ed.gov/?id=ED423422>
- Technological Devices for Enhancing Active Learning | Proceedings of the Sixth International Conference on Technological Ecosystems for Enhancing Multiculturality. (2018). *ACM Other Conferences*. <https://dl.acm.org/doi/abs/10.1145/3284179.3284246>

- Theobald, M. (2017). Children as research participants in educational research using video-stimulated accounts. *International Journal of Educational Research*, 86, 131–143. <https://doi.org/10.1016/j.ijer.2017.07.008>
- Trifonas, P. (2001). Simulations of Culture: Disney and the Crafting of American Popular Culture. *Educational Researcher*, 30(1), 23–28. <https://doi.org/10.3102/0013189X030001023>
- Uçar, T. F. (2004). Visual Communication and Graphic Design. Inkilap Bookstore.
- Usability 101: Introduction to Usability. (2012). Nielsen Norman Group. <https://www.nngroup.com/articles/usability-101-introduction-to-usability/>
- Wong A, Leahy W, Marcus N, Sweller J. (2012). Cognitive load theory, the transient information effect and e-learning. *Learn Instr.* 2012;22(6):449–57. <https://doi.org/10.1016/j.learninstruc.2012.05.004>.
- Yousef, A. M. F., Chatti, M. A. and Schroeder, U. (2014), Video-based learning: A critical analysis of the research published in 2003–2013 and future visions, in ‘The Sixth international conference on mobile, hybrid, and on-line learning.
- Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2006). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information & Management*, 43(1), 15–27. <https://doi.org/10.1016/j.im.2005.01.004>
- Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2016). Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. *Information and Management*, 43 (1), 15-27. <https://doi.org/10.1016/j.im.2005.01.004>