

# Student's Attitude Towards the Use of Video Podcast for Learning Buffer Solutions

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**Abstract:** The use of video podcasts has positively impacted student learning and engagement in various educational settings. In the specific case of learning about buffer solutions, video podcasts can effectively present key concepts and principles in an engaging and interactive way. This study aims to analyze students' attitudes toward the Video Podcast on Buffer Solution Material. The instrument used in this study is a closed-ended questionnaire consisting of 17 questions with six aspect categories: Overall, Explanation, Learning Features, Tempo, Interest, and Further Purpose. Then, 34 students from X MIPA at SMAN 1 Cangkringan were involved in this study. Total number of visitors for 5 days completed is 54 times. The students in this study had positive attitudes toward video podcast used to teach buffer solution concepts. It can be seen that the results of the student's attitude towards podcast that overall students liked the podcast that was posted (80%). The result revealed that, in general, students liked the posted podcast, and the video helped them understand the buffer solution material. However, the effectiveness of video podcasts may depend on various factors, including the quality and relevance of the content, the integration of the podcasts into the overall teaching and learning process, and individual student needs and preferences. To ensure the best possible outcomes, teachers should carefully consider these factors when using video podcasts as a learning tool for buffer solution concepts.

**Keywords:** Attitudes; Buffer Solutions; Podcasts

## Introduction

In the era of the industrial revolution 4.0, there has been a significant shift towards using technology in education. Internet-based technologies and applications have increasingly gained prominence across various aspects of our daily existence (Betaubun, 2021; Roach, 2014). In addition, the advent of computer networks and the Covid-19 pandemic have accelerated the delivery of e-learning (Therdyothin & Amphansap, 2022), making it more important than ever for teachers to be innovative in their use of technology to support student learning (Unger & Meiran, 2020). A critical aspect of this innovation is the development of independent learning situations that allow students to take control of their learning. This requires teachers to create learning media

that are interactive, engaging, and accessible and that utilize technology to support student learning in a variety of ways. Media that has been creatively designed and innovative technology can be used as technology in educational activities students and teachers can benefit from it (Fikri et al., 2022; Uzunboyly & Karagözlü, 2017).

One learning media that can attract students' interest is a Podcast. Podcasts are audio or video material available on the internet that can be automatically downloaded to a computer or portable media player for free or by subscription. A video podcast is popular and can be watched using the YouTube platform or Instagram account (Sholihah & Sholihah, 2022). They are easy to produce and can be segmented into different categories, such as teaching and learning, socialization of learning, and distribution of information

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from other schools (Syaifuddin & Prastyo, 2022). One of the strengths of podcasting is that it gives learners access to the information they need in an engaging and exciting way. Research has shown that when new information is conveyed through video, it is easier for students to learn and remember than presented as text (Hutabarat, 2020). Video podcasts are a powerful tool for learning chemistry because they combine the benefits of visual and auditory learning, making complex scientific concepts more accessible and engaging (Kalludi et al., 2015).

This is because our working memory has two channels for acquiring and processing information: a visual/image channel and an auditory/verbal channel. Cognitive theory in multimedia learning suggests that when information is presented through both channels simultaneously, it is more likely to be retained and remembered by learners. This is why videos, including podcasts, are effective learning tools, as they combine visual and auditory elements to enhance student learning.

Video Podcasts are audio-visual files distributed in digital format via the internet using personal computers or mobile devices. Video podcasts can be viewed on a variety of platforms, including YouTube, Vimeo, and other video hosting sites. They can cover a wide range of topics, including news, entertainment, sports, education, and more. Some ideas to integrate podcasts in the teaching and learning process, including quality, authenticity, and freedom of speech (JohnOloo & Elijah, 2015). Video podcasts allow for creativity in content creation, enabling educators to experiment with different storytelling techniques, visual effects, and multimedia elements to enhance the learning experience (Brame, 2016).

Some video podcasts feature a single host or a small group of hosts, while others may include interviews or discussions with guests. They may be produced professionally with high-quality cameras and editing equipment, or they may be more informal, with a DIY-style production.

Podcast is an effective and efficient learning medium which has the advantage of having the potential to be accessed automatically, easily and the control is in the hands of the user or listener (Laila, 2020). The impacts of podcasts in education are: (1) podcasts can be an innovative teaching resource for teachers to design class activities (Goldman, 2018), (2) podcasts help the learning process of students inside and outside the classroom, (3) podcasts can increase the readiness and preparation of prospective teachers .

In teaching, podcasts can have different roles including as learning materials, learning media, and as student projects (Dewi et al., 2011). The benefits of using video podcasts in education are improving learning and

study habits, positive attitudes of students towards learning and improving learning performance. Students judged the podcasts as attractive, amusing, and helpful. The podcast in some pointed to better and faster learning (Farshi & Mohammadi, 2013). In addition, the main advantage of video podcasts is that they can make students control when and where, and what they need to learn, as well as the pace of their learning. Podcasts are said to be effective because podcasts can be used as a varied medium of learning and learning, which can be listened to anywhere while doing other activities. Podcasts are not a substitute for class but as a supplement in learning.

The Podcast design framework for education (Drew, 2017; McNamara & Drew, 2019) consists of content type, media, duration, Speaker, Style, Purpose, Sound, Fit with other materials, Series Structure, Pedagogical Approach, and Subject. The effective use of video as an educational tool with consider of three including cognitive load, student engagement, and active learning (Brame, 2016). The different types based on the video podcast length : 1-5 minutes (short), 6-15 minutes (moderate), and more than 15 minutes (long) duration (Prakash et al., 2017). Cognitive theory in multimedia learning explains that working memory is very limited, has two channels for acquisition and processing of visual and verbal information. Using audio-visual media is expected to increase the cognitive load that is closely related to learning experiences. Student engagement can be keep by use conversational language, speak relatively quickly and enthusiasm or create videos to emphasize relevance to the course. The propose to making educational video for enhancing student learning from this medium. Students can monitor their own learning and it requires students to active.

The concept of chemistry has two aspects, namely macroscopic and microscopic concepts. Concepts that are macroscopic in nature can be observed directly against natural phenomena or experimental results. The microscopic concept describes objects at the micro level such as atoms, ions, molecules, etc. The students are required to understand the concept of chemistry. The buffer solution material is an essential material in which most of the material concepts are abstract in nature. To be able to understand the material for buffer solutions, students are expected to be able to understand the concepts of acid-base, equilibrium, and salt hydrolysis. The problem is the lack of student's focus educate during online learning. Buffer solution is a solution that can maintain or hold the pH fairly constant and has the ability to withstand changes in pH when dilution or addition of a small amount of acid or base. The ability of a buffer solution to maintain pH changes in the process of adding base or acid is called buffer action. Buffer

solutions in everyday life such as blood buffer solutions, carbonate buffers, phosphate buffers, and hemoglobin buffers. The students' difficulty in understanding the buffer solution material lies in the concept of understanding the buffer solution, calculating pH and pOH in the buffer solution using the principle of equilibrium, calculating the pH buffer solution when adding a little acid or base and the function of the buffer solution in the body of living things.

Studies reported learning videos have a very significant influence on students' understanding of chemical concepts (Adawiyah et al., 2021). The importance of learning using video after the COVID 19 pandemic, learning media solutions can be used to reduce students' learning difficulties. Given the continuous expansion of podcast production and listenership, podcasts have become impossible to overlook in today's digital era (Hemilia et al., 2022; Shahrizal et al., 2022). Educational institutions must start recognizing and harnessing the potential of digital learning through podcasts (Goldman, 2018). Video podcasts combine both audio and visual elements, enhancing engagement for learners. Therefore, this study aims to analyze the attitudes of students of the Video Podcast on Buffer Solution Material.

## Method

This descriptive quantitative research aimed to describe and analyze students' attitudes towards the Video Podcast on Buffer Solution Material. The sample for this research was students from SMAN 1 Cangkringan and consisted of 34 students from class XI MIPA 1 that were chosen through purposive sampling. The data collection techniques used in the study are student attitude questionnaires. Based on the observations, the researchers identified a need for innovation in teaching buffer solutions at SMAN 1 Cangkringan. The product innovation implemented as a result of this analysis was the creation of video podcasts. The researcher used the data collected from the student attitude questionnaires to analyze the effectiveness of the video podcasts and to evaluate the students' overall attitudes towards this type of learning material.

The video podcast created for this research was based on a podcast script, which was modified during the recording process to make the dialogue more interactive by teacher and the research. The video content provided an overview of buffer solutions, including their definition and different types, as well as acid and base buffers and examples of buffers in daily life. The video podcast clip was 22 minutes and 30 seconds in length and was edited using the CapCut and Canva applications. The video podcast was uploaded to

the *Bincang Sains* Podcast account on YouTube and was only accessible to the students who were the subject of the study. The researchers limited access to the video to ensure that the study was conducted under controlled conditions. The video podcast aired for five days, from 02 June 2022 to 06 June 2022.

To collect data on the student's attitudes towards the video podcast on buffer solutions, the researchers sent a link to the video podcast to the students and then asked them to fill out a questionnaire in the YouTube description box. The questionnaire was designed to measure students' attitudes towards the video podcast and was composed of 17 questions with six aspect categories: Overall, Explanation, Learning Features, Tempo, Interest, and Further Purpose (Kay, 2014). The Likert scale was used in the questionnaire to enable students to indicate their level of agreement on a scale of Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. The flowchart of this research is depicted in Figure 1. The average score is calculated using the equation 1. The results of the questionnaire data are calculated using the equation 2.

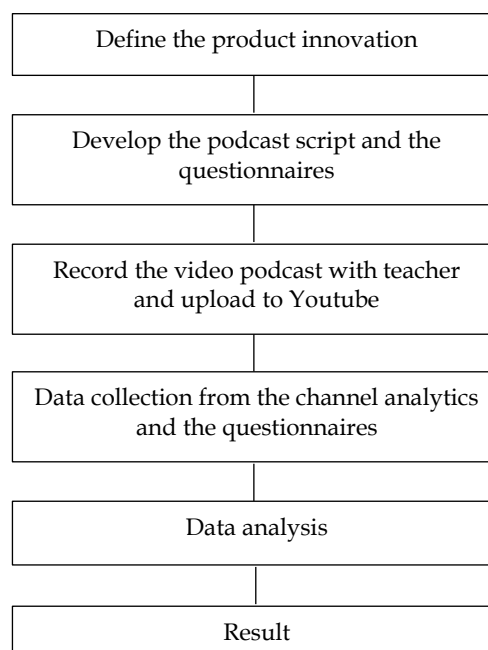


Figure 1. The flowchart research

$$\text{Score} = \frac{\text{total score}}{\text{number of respondent}} \quad (1)$$

$$\text{Index (\%)} = \frac{\text{total score}}{\text{maximum score}} \quad (2)$$

## Result and Discussion

Based on the results of observations and interviews with teachers of SMAN 1 Cangkringan, it was found that learning media based on textbooks or E-modules and

others were less attractive to students. Therefore, to overcome these issues, the teacher has been prepared learning supplements that can be accessible by students at anytime and anywhere and can control the pace based on their needs. The results of the total visitor data for 5 days of viewing on the Youtube Platform is 54 times. Key benefits of using video podcast in educational settings include improved learning and study habits (Noetel et al., 2021). The total number is more than the number of samples because there were some students who watched the video more than once. When planning and creating the video podcast for this study consider of three elements for video design including cognitive load, student engagement, and active learning (Brame, 2016).



**Figure 2.** The video podcast for learning buffer solution

Here is the result of percentage distribution of student's attitude towards video podcast buffer solution.

**Table 1.** Student's attitude for Overall Aspect

The statement	Score	Percentage (%)
Overall, I liked using the video podcast	4.00	80

Based on Table 1, it can be seen that the results of the student's attitude towards podcast that overall students liked the podcast that was posted (80%). The students in this study had positive attitudes toward video podcast used to teach buffer solution concepts. An average score of 4.00 out of the highest score of 5.00 on the Likert scale was obtained.

The results for the Explanations aspect, the majority students (up to 75%) agree that the video podcast was easy to follow, the material and examples clearly explained, and help them to understand the material of buffer solutions. Meanwhile, the statement "there are several explanation that confuse me" obtained an average score of 3.35 or 67%. Future research on the

video podcast might be reduce extraneous load and manages intrinsic load.

**Table 2.** Student's attitude for Explanations Aspect

The statements	Score	Percentage (%)
The video podcast can be easily followed.	3.73	75
The video podcast material is well explained.	3.85	77
Examples of applying buffer solutions on a daily basis are clearly explained.	3.91	78
There are several explanations that confuse me.	3.35	67
The video podcast helped me understands the material of buffer solutions.	3.76	75

**Table 3.** Student's attitude for Learning Features Aspect

The statements	Score	Percentage (%)
The text of the podcast video is easy to read.	3.52	71
The images on display give me a better understanding of the material on display.	3.67	74
The tips offered helped me understand the buffer solution material	3.79	76

In the Learning Features aspect, the text of the podcast video is easy to read. Also, the images on display give better understanding and the tips provided help them to understand the buffer solution. Cognitive theory in multimedia learning notes that working memory has two channels for information acquisition and processing: a visual or image channel and an auditory or verbal processing channel. Finally, the use of video lessons can be maximized with a suitable modality for the content. By using audio or verbal channels and visual or image channels to convey new information, and by adapting certain types of information to the most appropriate channels.

**Table 4.** Student's attitude for Pace Aspect

The statements	Score	Percentage (%)
Podcast video is too long	3.20	64
In my opinion, the podcast video is too fast	3.00	60
I use the pause button to stop at several places to understand the material presented.	3.76	75

The result for pace aspect, the average score of 3.20 or 64% students rated the video podcast was too long and the average score of 3.00 or 60% students rated the video podcast was too fast. The speed and intonation of



the voice can contribute to this the overall quality of the podcast encourage researchers to consider how attractive and clear the sound is to the listener. Seventy five percent students agreed that they use the pause button to stop at several places to understand the material presented. Making videos longer than 6-9 minutes is therefore likely to be wasted effort (Brame, 2016). The recommendation to keep each video brief in multiple videos for a lesson each in 6 minutes (Guo et al., 2014).

**Table 5.** Student's attitude for Engagement Aspect

The statements	Score	Percentage (%)
The video podcast was boring	2.73	55
I prefer podcast over textbooks	3.29	66

The half of students rated the video podcast that the video podcast was boring. On the other hand, regarding the use of podcasts that are preferred over textbooks, average score of 3.29 or 66% was obtained. This results is consistent with previous study that the participants also claim that through podcast students can access various and authentic learning materials that may not be available in the textbook (Suparjan et al., 2016). This finding for the student engagement was somewhat contradictory to previous research on video podcast use in higher education classrooms where students viewed them as enjoyable to watch, satisfying, motivating, and intellectually stimulating.

**Table 6.** Student's attitude for Future Purpose Aspect

The statements	Score	Percentage (%)
I would use this video podcast to help me with exercises given.	3.67	74
I would use this video podcast to review for test.	3.67	74
This video podcast will help me further explain the material of the buffer solution.	3.91	78

In the aspect of the future purpose aspect, the average score is 3.67 or 74% of students will use this video podcast to help them do the assignments given and would use this video podcast to review for test. Furthermore, the average score of 3.91 or 78% of students stated that the video podcast can be used to study again when there is an exam, and can provide additional explanations about the buffer solution material.

This result is consistent with previous research claiming that students had positive attitudes for the framework for creating effective instructional video podcasts, the results show that overall students have a positive attitudes toward the use of worked-example

video podcasts, noting they were useful and improved their understanding (Giannakos et al., 2014). Similar study report the result both survey data and open-ended comments indicated that the vast majority of students rated the worked-example video podcast useful tools that helped them learn concepts better (Adawiyah et al., 2021; Jiménez-Castillo et al., 2017; Kay, 2014). Podcast video-based collaborative tools offer many information-sharing features using a unique and powerful collaborative approach. Podcast video creation can be stimulating teacher's creativity in making interesting learning contents to enrich the learning experience for students. Podcasts are capable of being an innovative teaching resource for teachers and assist students' learning process, both inside and outside the classroom.

## Conclusion

The video podcast is an innovative method to learning outside of the conventional class time (Farshi & Mohammadi, 2013; Newsom et al., 2019) and not to replace textbooks and other materials but as a digital-based media for supplementary learning that enriches the learning experience of students with the presence of video podcasts it is. Total number of visitors for 5 days completed is 54 times. The total number is more than the number of samples because there were some students who watched the video more than once. Student watch the video podcast multiple views and its common (Richards-Babb et al., 2014). The student's responses base on the questionnaires show that they that overall students liked the podcast that was posted and the video podcast help them to understand the buffer solution material. Generally, students have positive attitudes towards the use of video podcasts for learning. In particular, this research has shown that video podcasts effectively improve student engagement, motivation, and learning performance. For example, in learning about buffer solutions, video podcasts could be an effective way to help students visualize and understand the key concepts and principals involved. In addition, by presenting information in an engaging and interactive way, video podcasts could help to make the material more accessible and easier to comprehend. However, it would be essential to ensure that the video podcasts are of high quality, accurate, and relevant to the course content and that they are integrated to support students' overall learning experience.

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This research contributes to develop the video podcast to know student attitude toward the use of video podcast for learning podcast buffer solution.

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### Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication on this paper.

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