Effectiveness of Edpuzzle Interactive Video on Student Interest and Learning Outcomes

Amirah Qonitatus Zakiyyah[1], Ence Surahman[2], Muhibuddin Fadhli[3], Zahid Zufar At Thaariq[4]

[1]*Universitas Negeri Malang, Indonesia.*
[2]*Universitas Negeri Malang, Indonesia.*
[3]*Universitas Negeri Malang, Indonesia.*
[4]*Cukurova University, Turkey*

Corresponding author: mirahzakiyyah23@gmail.com

Abstract:

Background: This research was carried out due to the low level of student interest and learning outcomes in the historical material on the Japanese occupation period, caused by the complexity of the subject matter and the limited use of interactive and engaging learning media. And in previous research, it was still rare to examine the use of Edpuzzle in social studies, especially in history material, where previous research mostly examined science or mathematics.

Purpose: The research was employed to determine the effectiveness of Edpuzzle interactive video learning media on students' interest and learning outcomes in the topic of the Japanese occupation period for eighth-grade junior high school students.

Method: This research employed a quantitative approach by a quasi-experimental design, specifically utilizing the non-equivalent pre-test post-test control group design.

Results: The outcomes revealed that the use of Edpuzzle media was effective in improving students' learning interest, but was not yet sufficiently effective in enhancing students' learning outcomes on the topic of the Japanese occupation period for eighth-grade junior high school students. Where students' interest in learning increased to 82.70% after using Edpuzzle.

Theoretical implication: This research strengthens the CTML theory that reveals that interactive media can improve the learning process.

Practical implication: The outcome of this research can be used to decide appropriate learning media for students.

1. Introduction

The Japanese occupation period is one of the topics taught in Social Studies at the eighth-grade level of junior high school. When discussing historical subjects, students often have inaccurate perceptions that may arise for several reasons. The complexity of historical material not infrequently makes students reluctant to research it (Rustantiningasih, 2013). The complexity of the subject matter, along with the teacher's role in delivering it, contributes to these perceptions. Learning approaches that rely solely on lectures devoid of being supported by other methods or media capable of improving student interest and interactivity often lead students to view history lessons as boring (Birsyada et al., 2022). An appropriate approach is needed so that the teaching of Social Studies on the topic of the Japanese occupation period can be delivered in an engaging and easily understandable manner for students. This would help achieve the learning objectives, not merely understanding the material, but also instilling the desired attitudes in students (Mulyana et al., 2023).

In teaching activities, five main components play an important role: learning objectives, subject matter, methods, media, and evaluation (Audie, 2019). These five elements are closely interconnected, making it essential to ensure that they are well-integrated and mutually supportive to create a more effective learning process. Learning media serve not only to deliver instructional content but also as a tool to enhance students' interest in learning. This is especially relevant in today's technologically advanced era, which necessitates the integration of technology as a learning medium to present material more engagingly and interactively. In the current context, teaching that relies solely on books as the source and medium, devoid of the support of more engaging and interactive media, is less effective in stimulating student interest and enhancing learning outcomes (Arinda, 2017).

An individual's tendency towards something considered interesting is referred to as interest (Anggraeni et al., 2021). In order for students to achieve their learning goals, interest serves as the first step in the process. Students tend to achieve optimal learning outcomes when they have a high interest in the learning process, whereas if students lack interest in learning, they are less likely to achieve maximum outcomes (Korompot et al., 2020). Learning outcomes refer to the abilities or skills possessed by students after undergoing the learning process provided by the teacher. Students may experience cognitive, emotional, or psychomotor outcomes (Agusti & Aslam, 2022). In the teaching and learning process, learning outcomes are also important as they allow teachers to measure how well students understand the subject matter. Maximum learning outcomes will be achieved when the learning material is more engaging and the students are more active (Nurfadhillah et al., 2021). Therefore, learning outcomes will not reach an optimal level if the learning media used are uninteresting and students have low learning interest. Thus, it is essential to choose appropriate learning media to achieve maximum learning outcomes.

The Social Studies subject contains learning materials that are broad and complex in scope. These subjects cover history, sociology, and geography. Students often perceive historical content, such as the topic of the Japanese occupation period, as boring because it tends to cause boredom that ultimately reduces their motivation to learn and leads to suboptimal learning outcomes (Suryani, 2023). This perception arises because the Japanese occupation material includes various elements that students are required to memorize, such as figures, dates, and locations of historical

events. The complexity of this material makes it difficult for students to understand when delivered solely through lectures (Mulyana et al., 2023). To achieve more optimal learning outcomes, appropriate learning media and innovative methods in delivering the material are needed, so that the intended messages can be received by students in an engaging and easily understandable manner.

Thaariq et al. (2024) posit that the effective delivery of instructional messages to learners is contingent upon the content embedded within the learning media utilized by educators. The structuring of this content must encompass the fundamental components of multimedia, namely: text, imagery, audio, video, and animation (Mukherjee, 2018). Contemporary learning media are now ubiquitously accessible, transcending temporal and geographical constraints (Thaariq, 2022). Consequently, in light of the accelerated progression of digitalization and automation, the development of these multifaceted multimedia requirements has not only become entirely feasible but also holds the potential for significantly greater interactivity.

One of the tools that can support a more efficient learning process is interactive video, which is a type of video containing interactive elements such as answering questions, completing surveys or polls, and other options that encourage active student engagement in learning (Afifiy, 2020). Through this medium, students can actively participate by directly interacting with the learning material. Interactive video media can be easily created utilizing various platforms. One such platform is Edpuzzle, an e-learning tool that enables the creation of interactive videos by allowing teachers to add questions inside the video content (Asmahda et al., 2023). Edpuzzle offers several useful features that make it easier for teachers to monitor student activities, one of which is the prevent-skipping feature that ensures students watch the entire video. The use of Edpuzzle is capable of providing a more engaging learning medium for students and contributes to increased learning interest, ultimately helping students achieve optimal learning outcomes (Sugiati, 2023).

Based on interviews employed by a social studies teacher at the school, it was revealed that students' interest and learning outcomes have not yet reached optimal levels in this subject. History topics are characterized by their complexity, encompassing elements such as when, where, who, and how events occurred. Additionally, the teacher noted that current teaching methods and learning media are not yet effective in engaging students or supporting better learning achievement. This has become a challenge for the teacher in creating an interactive learning environment. The low level of student interest and learning outcomes is also evident in the initial interest surveys and pre-test scores that were below 75. This finding confirms that the majority of students have not yet achieved learning mastery regarding the topic of the Japanese occupation, while also highlighting the persistent issue of low learning outcomes in Social Studies–History education. One potential solution to enhance both interest and academic performance is the use of engaging instructional media, such as interactive educational videos that can be delivered through the Edpuzzle platform.

This approach is supported by previous research indicating that Edpuzzle-based media favorably influences students' motivation and learning outcomes. For instance, a study by Hidayat et al., (2023), titled "Effectiveness of Utilizing Video-Based Edpuzzle Learning Media on Student Learning Outcomes in Temperature and Thermal Expansion Materials," demonstrated a significant, favourable effect of

Edpuzzle on student learning outcomes. In addition, research employed by Vivianingsih et al., (2023) titled "The Effect of Interactive learning Video Media Aided by Edpuzzle Toward Student learning" shows that Edpuzzle media has been successful in improving student learning outcomes. However, based on the previous studies mentioned earlier, the researcher has not found the application of Edpuzzle-assisted interactive video learning media in Social Studies subjects, specifically on the topic of the Japanese occupation period for eighth-grade junior high school students, aimed at measuring its effectiveness in enhancing student interest and learning outcomes. The studies previously cited were mostly applied in science and mathematics subjects.

Therefore, the researcher is interested in conducting research titled "The Effectiveness of Edpuzzle Interactive Video Media on Student Interest and Learning Outcomes in Social Studies". This research focuses more on seeing how the interactive video media Edpuzzle, when applied to social studies lessons, on students' interests and learning outcomes. Additionally, there are three hypotheses in this study: first, whether or not Edpuzzle's interactive video content increases students' interest in learning; second, whether or not Edpuzzle's interactive video content increases student learning outcomes; and third, whether or not Edpuzzle's interactive video content increases student interest and learning outcomes. It is expected that the findings of this study will provide practical guidance for social studies teachers in selecting more innovative instructional media, while also serving as a reference for schools in integrating digital technology into history education. Furthermore, this research is anticipated to enrich the body of educational research on the utilization of Edpuzzle in social studies, particularly within the context of history learning.

2. Method

A quasi-experimental design, notably the non-equivalent pretest-posttest control group design, was used in this study's quantitative methodology. Where both groups, the control and experimental group, are given different treatments to observe changes occurring before and after the treatment, as well as to compare the outcomes between the two groups. This type of research design, known as the non-equivalent pretest-posttest design, can be clearly seen in Table 1.

Table 1. Research design

Class	Pretest	Treatment	Posttest
Experiment	X_1	T	X_2
Control	Y_1	-	Y_2

Source: (Sugiyono, 2022)

In this research, the research subjects were eighth-grade students at SMP NU Sunan Giri Kepanjen, divided into two class groups with a total of 28 students in each class. Class VIII A was the control group and was taught using PowerPoint-based materials, while Class VIII B was the experimental group and was taught using Edpuzzle-assisted materials. The selection of research subjects was carried out taking into account that the two classes had a similar initial level of ability, so that it could provide a fairer basis for comparing the results obtained from the treatment.

To measure students' interest and learning outcomes, the research employed instruments consisting of a student interest questionnaire as a non-test instrument, along with pre-test and post-test questions as test instruments. Each instrument consists of 20 questions. Instruments were given to both classes before and after

treatment. Before testing the instrument, a validity and reliability test is carried out to determine the suitability of the instrument. Validity tests are carried out by experts, and statistical validity tests. Where the results of the validity test of the instrument are proven to be valid, with the results of r-calculated > r-table. Apart from that, a reliability test was also carried out, which showed that the instrument was reliable. The Cronbach's alpha value was > 0.07, where the value for the test instrument (pre-test) was 0.887, (post-test) 0.891, and the non-test instrument was 0.876.

A necessary test, the normality and homogeneity test, was part of the data analysis methodology employed in this study. According to the category, the data is deemed to be normally distributed and homogenous if the significance value is more than 0.05. The results of the two class groups were compared using a t-test for hypothesis testing, which uses the concept that the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected if the significance value is less than 0.05. Additionally, the t-test is used when the data is homogeneous and regularly distributed; if the data is not, the Mann-Whitney test is used as a hypothesis test. The Mann-Whitney test is the nonparametric version of the independent samples t-test (MacFarland & Yates, 2016). Additionally, an N-gain test was performed to decide the effectiveness level of Edpuzzle on students' interest and learning outcomes, by category, as presented in Table 2.

Table 2. N-gain category

N-gain Score	Criteria
N-gain < 0.3	Low
$0.3 \geq$ N-gain < 0.7	Medium
N-gain $\geq$ 0.7	High

Source: (Kadaritna & Efkar, 2017).

3. Results and Discussion

3.1. Effectiveness of Edpuzzle interactive video learning media on students' interest in learning

Before conducting the hypothesis test, a normality test and a homogeneity test were first performed as prerequisite tests. The outcomes of the prerequisite tests for the non-test instrument (student interest questionnaire) revealed a significant value > 0.05 for both the normality and homogeneity tests. This reveals that the data is normally distributed and homogeneous, thus meeting the requirements to proceed with the t-test hypothesis testing. However, for the test instrument (pre-test and post-test questions), the prerequisite test outcomes did not need the assumptions of the t-test, as the significance value was < 0.05. Therefore, instead of utilizing a parametric t-test, the hypothesis testing was employed utilizing a non-parametric Mann-Whitney U test.

Following the Edpuzzle media treatment, there was a notable shift in interest in the experimental class, according to the results of the student interest questionnaire, in contrast to the control class that utilized PowerPoint-based instruction. The difference in initial and final interest levels between the two classes is illustrated in Figure 1.
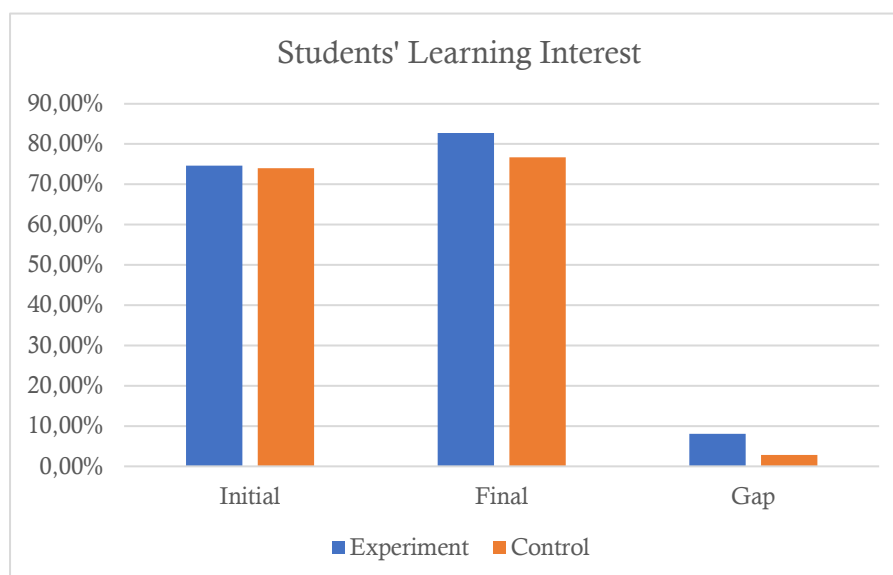
Figure 1. Percentage of students' learning interest

Based on Figure 1, it can be observed that the experimental class had an initial interest score of 74.61%, which increased to a final interest score of 82.70% after the implementation of Edpuzzle media. This reflects an improvement of 8.09%. In contrast, the control class had an initial interest score of 73.97%, which increased slightly to a final interest score of 76.77%, revealing a smaller improvement of only 2.8% after utilizing PowerPoint-based media. By these outcomes, it can be summarized that the experimental class utilizing Edpuzzle media demonstrated a significantly higher increase in learning interest compared to the control class, which was not exposed to Edpuzzle. This indicates that students' interest in social studies, especially the subject of the Japanese occupation period, is positively impacted by the use of interactive video learning materials (Edpuzzle).

The difference in student learning interest between the experimental class using Edpuzzle media and the control class that did not use Edpuzzle was assessed using an independent samples t-test as part of a hypothesis test. Table 3 displays the findings of the t-test for learning interest.

Table 3. Outcomes of the t-test

Independen Sampels Test					
	F	Sig.	t	df	Sig. (2-tailed)
Equalvariancesassmed	0.392	0.534	-2.205	54	0.032
Equalvariances notassumed			-2.205	52.675	0.032

The outcomes of the t-test in Table 5 show that the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected. The sig. (2-tailed) value for student learning interest is 0.032, which is less than 0.05. Thus, it can be said that using Edpuzzle materials to increase students' interest in learning about the Japanese occupation period is a successful strategy.

Based on the outcomes of the research employed, it can be summarized that there is a significant change in student learning interest toward the topic of the Japanese Occupation Period when utilizing Edpuzzle interactive media as a learning

tool compared to using conventional media. This also shows that Edpuzzle, as a form of video-based learning media combined with various questions as a tool for evaluating students' ability levels, is proven to have a more significant influence on the learning process. This finding aligns with the Cognitive Theory of Multimedia learning (CTML) developed by Mayer, which states that the combination of multimedia elements such as text, images, and audio can enhance the learning process (Mayer & Moreno, 2016). Apart from that, Edpuzzle, as interactive video media, shows that it is a learning media capable of increasing engagement in learning, through interaction between students and the questions and videos inside. This is in line with the engagement theory, which states that interactive learning media, such as interactive videos, make lessons clearer and allow for greater student engagement and interaction, thereby enhancing both learning interest and understanding (Kurniasih et al., 2023).

Learning media not only serve as a means of delivering instructional content to students but also play a crucial role in enhancing student interest in learning. It is important to recognize that learning interest itself is a key psychological factor that significantly influences an individual's ability to focus their attention and mental effort, thereby fostering greater concentration and more effective learning outcomes during the learning process (Waruwu & Sitinjak, 2022).

The implementation of Edpuzzle as a learning medium in teaching and learning activities has great potential and is highly effective in improving students' interest in learning. This is due to the presence of various beneficial features inside Edpuzzle that support the creation of learning media that is not only engaging but also interactive. Edpuzzle offers attractive features such as voice-over functionality for adding audio to videos, the prevent skipping feature to ensure students watch the entire video, and the quiz feature that allows insertion of various types of questions or tasks directly into the video (Mischel, 2019).

The outcomes of the learning interest questionnaire administered to students in both classes (experimental and control) reveal that the experimental class achieved a higher score compared to the control class. The initial interest scores were 74.61% for the experimental class and 73.97% for the control class. The percentage of initial learning interest before the treatment revealed no significant difference between the two classes. However, after the treatment, a considerable difference emerged in the final learning interest scores. The experimental class, which utilized Edpuzzle-assisted interactive video media, recorded a final interest score of 82.76%, while the control class, which utilized PowerPoint-based media, reached a score of 76.77%. This improvement is credited to the utilization of Edpuzzle as an interactive medium, which successfully captured students' attention and promoted active engagement in the learning process, consequently boosting their interest in learning. Meanwhile, the increase in interest in the control class was not as significant due to the use of non-interactive PowerPoint media, where there was no interaction among students and the media, resulting in minimal student engagement. As previously stated, efforts to improve learning interest are likely to be less effective if no more engaging or participatory media are used (Arinda, 2017).

In addition, the outcomes of the t-test (Independent Samples t-test) by a significance value of $0.032 < 0.05$ reveal that H_0 is rejected and H_a is approved. Therefore, it can be summarized that there is a statistically significant effect that demonstrates theeffectiveness of utilizing Edpuzzle-assisted interactive video media

in enhancing student learning interest on the topic of the Japanese Occupation Period, contrasted to the use of conventional presentation media such as PowerPoint. The N-Gain test outcome for learning interest was 0.31, indicating that the use of Edpuzzle media falls within the medium effectiveness category in enhancing student interest in the subject matter. This aligns with the engagement theory states that technology can facilitate engagement in ways that are difficult to achieve through conventional teaching methods (Kearsley & Shneiderman, 1998). The findings of this research also support previous research employed by Ramasany et al., (2022), through research which reveals a favourable change in student learning interest. This is consistent with previous statements suggesting that Edpuzzle, as an interactive learning medium, can enhance student interest in learning (Sugiati, 2023).

3.2. Effectiveness of Edpuzzle interactive video learning media on student learning outcomes

The student learning outcomes, measured through pretest and posttest outcomes, reveal that there was a greater improvement in the experimental class after utilizing Edpuzzle media, compared to the control class that utilized PowerPoint-based instruction. This difference is visually presented in Figure 2, which illustrates the comparison of learning outcomes among the two groups before and after the treatment.
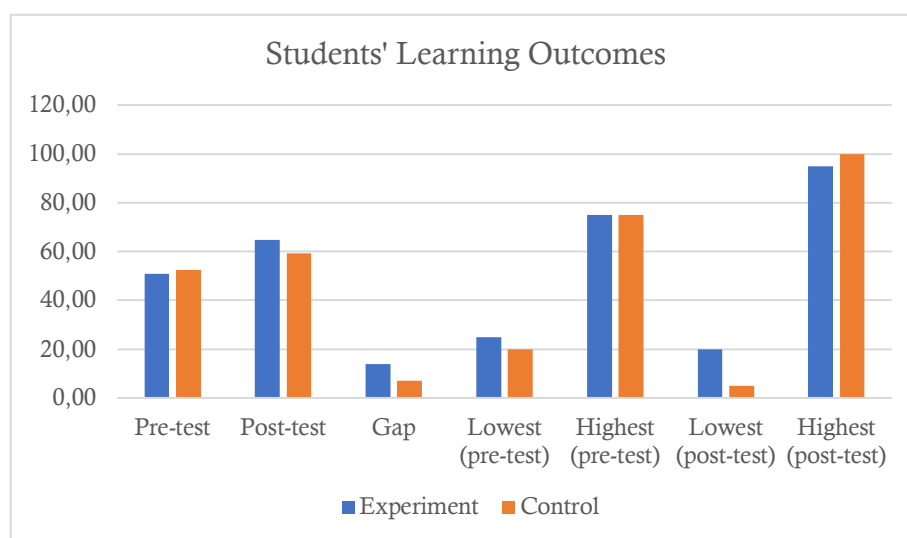

Figure 2. Students' Learning Outcomes

According to Figure 2, the average pre-test score in the experimental class was 50.89, and the post-test score was 64.82, revealing a difference of 13.93 after the use of Edpuzzle media in learning. Meanwhile, the control class had a pre-test score of 52.32 and a post-test score of 59.28, revealing a difference of 6.96 after the use of PowerPoint media. In addition, there is also a visible difference in the greatest and lowest scores between the two classes. Furthermore, there is a discernible difference between the two classes' highest and lowest scores. The control group scored the lowest at 20 and the highest at 75 on the pre-test, while the experimental group scored the lowest at 25 and the highest at 75. On the post-test, the experimental group scored the lowest at 20 and the highest at 95, while the control group scored the lowest at 5 and the most at 100.

To ascertain the difference in student learning outcomes between the experimental class that utilized Edpuzzle media and the control class that did not use Edpuzzle, a hypothesis test utilizing the Mann-Whitney test was employed. The outcomes of the Mann-Whitney test on student learning outcomes are presented in Table 4.

Table 4. Outcomes of the Mann-Whitney Test

Test Statistics[a]	
MannWhitneyU	381.500
WilcoxonW	787.500
Z	-0.173
Asymp.Sig (2-tailed)	0.863

Student learning outcomes have a Sig (2-tailed) value of 0.863 > 0.05, which indicates that H_0 is accepted and H_a is rejected since the significance value is higher than 0.05, according to the results of the Mann-Whitney test. Therefore, it may be concluded that Edpuzzle media use is now insufficiently successful in improving student learning outcomes regarding the Japanese occupation period.

The findings of their study on student learning outcomes show that students who used interactive video content aided by Edpuzzle did not significantly differ in their learning outcomes. According to Nabillah & Abadi, (2019), internal and external factors are two key determinants of student learning outcomes. More engaging and interactive media have the potential to increase learning interest and ultimately lead to better learning outcomes (Nurfadhillah et al., 2021). However, the findings of this research reveal that there was no statistically significant difference between the experimental class and the control class. In other words, the use of Edpuzzle-assisted learning media did not produce a noticeable or significant difference in cognitive learning outcomes, contrary to expectations. Edpuzzle, as a new media, short implementation on one focus of material, and limited time to properly introduce the media, are the triggers for no significant changes in student learning outcomes. Because students have not fully adapted to this medium.

In addition to its advantages, Edpuzzle, as an interactive video learning medium, also has some weaknesses (Mischeil, 2019). It takes time to understand how to use Edpuzzle, so teachers need sufficient time to explain its functions to students. Moreover, Edpuzzle does not provide a feature that allows students to communicate with each other or with the teacher, thereby requiring a third-party platform to facilitate two-way communication. The video editing features are also limited, as they only allow trimming at the beginning and end of the video; therefore, when educators wish to edit specific parts, additional editing applications are needed. Furthermore, the voice-over feature can only be used to record audio for the entire video rather than for selected segments, although an audio note feature is available. These limitations contribute to the absence of a significant improvement in student learning outcomes, indicating that additional time and support from other platforms are necessary to maximize the use of Edpuzzle.

The outcomes of the pre-test and post-test given to both classes reveal an increase in the average score in the experimental class; however, there was no statistically significant effect. The experimental class experienced an increase of 13.93 after the use of Edpuzzle media, from a pre-test score of 50.89 and a post-test score of 64.82. Meanwhile, the control class experienced an increase of 6.96 after the use

of PowerPoint media, with a pre-test score of 52.32 and a post-test score of 59.28. These average outcomes reveal higher learning outcomes compared to the control group. Moreover, the post-test scores of students in the control class were lower than their pre-test scores, as revealed in Figure 2. This phenomenon occurred because the learning process in the control class tended to be repetitive and lacked active interaction, which may have led students to perceive the post-test merely as a repetition of the pre-test they had previously completed. This could reduce the seriousness with which students approached the test, as it is noted that classroom designs that support active learning can increase student engagement compared to monotonous methods (Odum et al., 2021). In addition, this may also be due to a lack of perceived usefulness, where control class students might have felt that the learning provided had no effect or was uninteresting, and thus they did not see the urgency to perform at their best in the post-test. As has been stated, students' perceptions of learning quality influence their motivation and academic achievement (Mushtaq & Khan, 2012).

However, based on the outcome of statistical analysis utilizing the Mann-Whitney test method, it was found that the significance value (sig. 2-tailed) obtained was 0.863 > 0.05, which means that H_0 is approved, and H_a is rejected. Thus, it can be summarized that there is no significant effect, indicating that the use of the interactive video learning media Edpuzzle is not yet sufficiently effective in enhancing student learning outcomes on the topic of the Japanese occupation period, when contrasted to the use of more conventional learning media such as PowerPoint.

In addition, based on the N-Gain test outcomes, which revealed a value of 0.24, it reveals that the use of Edpuzzle media falls into the low effectiveness category in enhancing student learning outcomes. This finding contradicts the belief that Edpuzzle, as an interactive medium, would enhance learning interest and optimize learning outcomes (Sugiati, 2023). It also appears to be inconsistent with previous research employed by Kurniawan et al., (2023), which found that the use of Edpuzzle-assisted learning media had a favourable effect on enhancing students' cognitive learning outcomes. The difference in findings may be due to various factors such as differences in subject matter, student characteristics, implementation methods, or technical limitations encountered during the use of the media.

3.3. Effectiveness of Edpuzzle interactive video learning media on student interest and learning outcomes

According to the research findings, teaching eighth-grade junior high school students about the Japanese occupation era using the interactive video platform Edpuzzle increased their enthusiasm for learning. However, the results also indicated that while the medium was effective in engaging students, it did not lead to a significant improvement in their learning outcomes. Nevertheless, because of its capacity to capture students' attention and foster interaction, Edpuzzle as an educational tool can enhance students' interest in the learning process.

In contrast, the experimental class's average learning outcomes were higher than those of the control group. However, the utilization of Edpuzzle media did not significantly alter student learning outcomes, according to the statistical results. So Edpuzzle media is not yet sufficiently effective in enhancing student learning outcomes on the topic of the Japanese occupation period. Limited time to get to know and use Edpuzzle, and complex material, means that the results obtained are

not optimal. With habituation and a longer time to introduce Edpuzzle, and use that does not only focus on one material, and is also supported by other platforms, the results may be much more optimal.

Based on the outcomes of data analysis on students' interest and learning outcomes, the third hypothesis, which stated that the use of Edpuzzle learning media is effective in enhancing students' interest and learning outcomes on the topic of the Japanese occupation period, is rejected. This is because Edpuzzle did not reveal a significant effect on students' learning outcomes. Therefore, it can be summarized that its use is less effective in enhancing learning outcomes, although it has been proven effective in improving students' learning interest. This does not fully align with the initial expectation that Edpuzzle would present engaging learning material for students that, in turn, would increase learning interest and lead to optimal academic achievement (Sugiati, 2023).

These findings demonstrate the critical role that educational media play in fostering student interest and improving learning outcomes. With this research, teachers can choose appropriate learning media that suit students' learning needs. The existence of limitations in the research makes it possible for further research to consider a longer period of time, and try to combine it with other platforms or try it on other materials.

4. Conclusion

This study concludes that the use of Edpuzzle-assisted interactive video materials successfully increases eighth-grade social studies students' interest in learning about the Japanese occupation period. Edpuzzle makes the learning process more engaging and allows students to be actively involved through interactive videos and embedded questions. However, despite this positive effect on student interest, the use of Edpuzzle alone has not proven sufficiently effective in improving student learning outcomes, as indicated by the absence of a statistically significant difference between the experimental and control groups. These results suggest that while Edpuzzle has potential as an engaging learning tool, its effectiveness in enhancing learning outcomes may require further familiarization and integration with other instructional methods or platforms. This study is expected to serve as a useful reference for teachers in selecting learning media that align with students' needs and support the learning process. Furthermore, given the limitations of this research, future studies are encouraged to explore the integration of Edpuzzle with other pedagogical approaches or its application to different social studies topics.

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