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The Effect of Augmented Reality Media with a STEAM approach on Student Learning Motivation in History Subjects

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Abstract: *Augmented reality (AR) media is a technological merger of real and virtual objects in real time in three-dimensional form. This media helps users understand their surroundings with technology and information. The application of augmented reality media can motivate learners by providing interesting and fun learning experiences in various fields. The increase in learner motivation can largely be attributed to the elements of curiosity, fantasy and control presented using augmented reality technology. The application of augmented reality media makes learners' interaction with learning materials increase, thus having a positive impact on their learning motivation. Researchers use the STEAM approach as a learning approach to foster learning motivation in learning activities. The purpose of this study was to determine the effect of augmented reality media with the STEAM approach on student learning motivation in class X History subjects at SMA Negeri 1 Tanggul. This study uses a quantitative approach with a quasi experimental design research method. The experimental and control groups were not randomly selected, which was determined by calculating the average value of the Midterm Examination for history subjects in seven classes to be tested for homogeneity. The sample consisted of 60 students in class X1 as the experimental class and X2 as the control class. The experimental and control groups were not randomly selected. Data were analyzed by ANCOVA test. The results showed: 1) there is a significant effect of Augmented Reality learning media with STEAM Approach on students' learning motivation in History subjects.*

Keywords: Augmented reality, STEAM, Learning Motivation.

1. INTRODUCTION

History learning is an important part of a well-rounded education, offering many benefits that extend beyond academics to personal and professional development. Progressively, history learning must be able to contextualize various events that occurred in the past with various events experienced now, so that we can reflect on each other, evaluate, compare, or make decisions, as well as orientation for a better future life. The estuary of history learning that is oriented towards thinking skills will naturally encourage the formation of independent humans who have historical awareness and are in line with the profile of Pancasila students. In Phase F, students in Class XI are able to use primary and/or secondary sources to conduct diachronic and/or synchronic historical research and then communicate it in oral, written, and/or other media. In addition, they are also able to use historical skills to explain, analyze, and evaluate historical events, and interpret the values contained therein.

Various problems in history subjects include the low learning motivation obtained. Based on research by Rulloh, et al., (2020), from the results of his observations it was concluded that the motivation of students to learn history was low. The reason is that during the learning process the delivery of material and reinforcement provided by educators is considered not to motivate students. Research by Hapsari et al., (2019), stated that the cause of the low learning motivation obtained by students was due to the history learning media without the use of learning media. Research by Abdullah et al., (2021), identified that during the history learning process, students' motivation was still low, because educators dominantly positioned themselves as patrons, not facilitators and mediators of learning. In other learning concepts, learning activities in the education process also require a supporter of a good teaching and learning process.

In addition, effective motivation is essential for effective learning. Learners' desire or participation to engage directly in the learning environment can be interpreted as motivation. High learner motivation has a significant impact on increasing self-learning endurance, which correlates significantly with academic achievement. Conversely, it also affects the content, method and timing of the learning process, which can be used to improve future performance. Three general categories of achievement motivation are an individual's confidence in performing a task, having a goal to self-organize, and having a positive task value (Di Serio et al., 2013).

As time goes by, the main focus is on technological advancements to improve teaching methods, communication methods, and the dissemination of more accurate information, thus improving understanding (Salvador et al., 2012). Technology is also anticipated to be a solution, as the challenges currently faced in the pandemic era require the brain to engage in deeper thought processes to develop technologies that benefit the future. Educational procedures have also been changed by technological advancements. Projectors and computers are some many digital media used to deliver material. Media can also be used in the teaching and learning process when the teacher cannot communicate through words or sentences. One of them is the use of computerized technology based on information and communication to increase learners' motivation and encourage

them to participate in learning activities, thus causing positive psychological effects (Bachtiar et al., 2015).

Technology that is currently developing in terms of image visualization can be done using AR (Augmented Reality) technology. Augmented reality media is used by teachers in an immersive learning environment (learning that uses virtual objects or spaces in every learning process) (Meletiou-Mavrotheris, 2019). Augmented reality media develops learning motivation, problem-solving, and learning outcomes belajar (Astuti et al., 2019; Ziden et al., 2022; Liu et al., 2023; Khan et al., 2019; Yu et al. 2022). Augmented reality in Indonesia has developed over the past 5 years. However, in its development it is still rarely used as a learning media in the world of education (Umamah et al. 2020). The learning center of the Ministry of Education and Culture introduced Augmented Reality to become a creative, innovative, and interactive learning media. Therefore, one of the media in the independent curriculum that is pursued is Augmented reality media.

Research has shown that the use of AR (Augmented Reality) in STEAM education can deepen learners' understanding of abstract concepts and theories. This is particularly relevant in history education, where AR can help learners visualize and connect historical events to their wider historical context (Jesionkowska et al., 2020). AR (Augmented Reality) can be used to create immersive and interactive learning experiences in history education. For example, AR (Augmented Reality) can be used to visualize historical events, such as battles or architectural structures, allowing learners to explore and interact with those events in a more engaging way (Rukayah et al. 2022). STEAM education integrates the arts and creative thinking into STEM disciplines, which encourages holistic learning and problem-solving skills. This approach is particularly useful in history education, which can help students engage more deeply with historical events and cultural contexts (Rukayah et al. 2022). The incorporation of AR (Augmented Reality) into STEAM education, particularly in history education, offers many benefits, including better understanding, higher engagement and a more interactive learning experience.

Based on the description that has been given, the researcher intends to conduct research with the title "The Effect of augmented reality Media with STEAM Approach to Learning Motivation in History Learning". This research aims to verify whether there is a significant effect of the application of augmented reality media with a STEAM approach to student learning motivation in history learning.

2. LITERATURE REVIEW

2.1 The Urgency of Augmented Reality Media in History Learning

The incorporation of real objects and virtual objects in a real environment; and real time interactively can be found in augmented reality media (Verma et al., 2022; Azuma et al., 2001). Augmented reality supported environments provide more diversity and areas of use as they are based on the real world independent of time and place. So it can be considered that augmented reality is useful in education and other disciplines (Ruiz et al., 2018). The use of augmented reality media in learning attracts learners' attention so that it can overcome learning difficulties because it is not only a theoretical explanation but also can visualize events (Liu et al., 2023; Low et al., 2022; Zhang et al., 2023; Akçayır et al., 2017; Khan et al., 2019; Remolar et al, 2021). It can be said that augmented reality environments in education are preferred, mainly because of the perfect interaction of reality with virtual.

The use of augmented reality media through computer-generated realistic virtual objects (text, images, or animations) and controlled in 3D space makes history learning more immersive (technology that combines virtual and real worlds) (Garcia, 2020; Verma et al., 2022). Augmented reality enhances history teaching and visualization by turning real-world objects into learning centers (Challenor et al., 2019). The application of augmented reality in history education supports a better level of historical thinking (Geroimenko, 2020). The relationship between reality and virtual in augmented reality is considered beneficial in the delivery of history learning.

2.2 STEAM Approach in History Learning

STEAM stands for Sciences, Technology, Engineering, Arts and Mathematics (Sickler-Voigt 2023; Burns et al., 2021; Martinez, 2017; Babaci-wilhite, 2019; Khine et al., 2019; Sharma et al. 2022; Garza et al., 2019). STEAM education is necessary for 21st century innovation (Maeda, 2013). The conception of STEAM uses 'A' to denote a fifth disciplinary area namely, arts and humanities (Khine et al., 2019). Several studies highlight the importance of Sciences in STEAM history learning. For example, Park and Cho (2022) found that STEAM curricula often include objectives related to historical analysis skills, which are sometimes integrated with scientific inquiry skills. The importance of Technology in STEAM history learning helps learners learn the process of scientific discovery, making complex historical events more interesting and interactive (Plageras et al., 2020). The importance of Engineering in STEAM history learning helps learners develop a holistic understanding of the interrelationships between various fields of science, including history, science, technology, engineering and mathematics (Lestari, Ibrahim, and Iriani 2023). The importance of Art in STEAM history learning is essential to equip students with a holistic understanding of the interrelationships between various fields, including history (Lestari et al. 2023). The importance of Mathematics in STEAM history learning, for problem solving, which is an important aspect of STEAM education. By incorporating mathematics into history learning, learners can develop critical thinking and analytical skills, enhancing their ability to approach historical problems and events from multiple perspectives (Rahardjo, 2019). STEAM education helps learners build shared creativity by connecting different disciplines and areas of learning (Sharma

et al., 2022; Watson, 2016; Guyotte et al., 2014). The increasing use of technology makes STEAM skills essential for learning (Spector, 2015). The application of the STEAM approach as interdisciplinary learning is feasible in the history learning process.

History learning has been recognized not only in humanities and social science education, but also in STEM education. Through STEM and art, STEAM brings new insights beyond these two fields. STEM and history are often integrated using the history of science and technology (Park et al., 2022). The history learning objectives according to Park and Cho (2022) can be realized in the STEAM curriculum, using the four history learning objectives proposed by Barton and Levstik (2004) as a theoretical lens, including identification, analysis, moral response, and exhibition. 1. Identification, learners are asked to be able to establish a relationship between themselves and historical events. 2. Evaluation, learners ask questions, collect sources and artifacts, then analyze them to get historical information. 3. Moral response, studying history has a moralizing effect, and heroes are used to model human behavior. 4. Exhibition, STEAM encourages creativity and expresses their STEM understanding through art. The application of the STEAM approach as interdisciplinary learning is feasible in the history learning process.

2.3 Relationship between Augmented Reality Media and STEAM Approach

Augmented reality technology is used to integrate Science, Technology, Engineering, Arts, and Math (STEAM) disciplines. This interdisciplinary approach helps learners develop cross-disciplinary knowledge integration, problem-solving, and self-learning skills. Augmented reality media helps teachers optimize their teaching approach by providing interactive and real-time learning experiences. This increases the effectiveness of STEAM education by making complex concepts more accessible and engaging for learners (Winarni et al., 2023). The use of augmented reality media in STEAM education is proven to increase learner engagement and understanding, as shown by a significant increase in normalized gain scores (Atmojo et al., 2021). The STEAM approach with augmented reality media has been shown to have educational, social and economic consequences (Rukayah et al., 2022). It improves the quality of learning, increases learner engagement and supports the development of essential skills needed for future education and careers.

2.4 Relationship between Augmented Reality Media and Learning Motivation

The use of augmented reality in educational settings increases motivation and encourages self-directed learning (Kaliraj et al., 2021). Augmented reality helps users understand their surroundings with technology and information (Ruiz et al., 2018). Therefore, the application of augmented reality can motivate learners by offering engaging and fun learning experiences in various fields (Ruiz et al., 2018; Gargrish *et al*., 2021; Khan *et al*., 2019; Ibáñez *et al*., 2019; Martín-Gutiérrez *et al*. 2015; Saadon *et al*., 2020; Kaliraj et al., 2021; Marini *et al*., 2022; Vargas *et al*., 2020). The increase in learner motivation can largely be attributed to the elements of curiosity, fantasy, and control presented using augmented reality technology (Belda-Medina and Marrahi-Gomez, 2023). Augmented reality combines real-world elements recorded by cameras in the form of multimedia including text, images, movies, 3D models, and animations (Cai *et al*., 2021). This makes augmented reality can be used to recreate history by embedding technology in museums and historical sites (Challenor et al., 2019). The application of augmented reality promotes engagement and motivation for learners to acquire historical knowledge (Azhar et al., 2019). The application of augmented reality makes learners' interaction with learning materials increase, thus having a positive impact on their learning motivation.

The effect of augmented reality media on learners' learning motivation is analyzed using ARCS Motivation, consisting of the abbreviations Attention, Relevance, Confidence, and Satisfaction. Some of the ways augmented reality media can influence learning motivation using ARCS learning motivation indicators are Attention, augmented reality can attract learners' attention by making learning more fun and interesting (Low et al., 2022); Relevance, augmented reality can make learning more relevant by providing real-world examples and applications (Lai et al., 2021); and Confidence, 2021); and Confidence, augmented reality can develop learners' confidence by providing immediate feedback (Lai et al., 2021; Low et al., 2022); Satisfaction, augmented reality can increase learners' satisfaction by making learning more fun and rewarding (Di Serio et al., 2013).

2.5 Relationship between STEAM Approach and Learning Motivation

STEAM is seen as a cross-curricular collaboration as the integration of the arts into the STEM curriculum provides pathways for personal meaning-making and self-motivation (Garza et al., 2019). The addition of 'A' representing the arts encourages collaboration, creativity and innovation, and develops 21st century skills such as increased engagement and motivation to learn, communication and collaboration, critical thinking and creative thinking (Rahmawati et al., 2022; Quigley et al., 2017; Martinez 2017; Khine et al., 2019). The use of art in history lessons allows learners to explore the cultural and social context of historical events, which can help deepen their understanding of the material (Park et al, 2022). STEAM education consists of learning experiences, which increase their motivation to learn and build real-life connections to generate learners' interest and effective learning (Quigleyet al., 2017; Jia et al., 2021; Ozkan et al, 2021; Conradty and Bogner, 2020; Suryaningsih et al. 2022). Art in STEAM can increase interest, motivation, creativity, innovation, learner engagement, and problem-solving in the learning process to make effective learning.

ARCS motivation, consisting of the abbreviations Attention, Relevance, Confidence, and Satisfaction, has been used to analyze the STEAM approach to learning motivation in students. Some ways ARCS learning motivation indicators can influence the STEAM approach are Attention, Using technology and multimedia tools to create interactive and engaging learning experiences (Wahyudi et al., 2017); Relevance, Incorporating interdisciplinary learning to show learners the connection and relevance between different subjects (Jia et al., 2021); Confidence, 2021); Confidence, Provides opportunities for learners to work together, share their answers and ideas with others (Wahyudi et al., 2017); Satisfaction, Gives learners the opportunity to assess what they have learned and to celebrate their achievements (Wahyudi et al., 2017).

3. RESEARCH METHOD

3.1 POPULATION AND SAMPLE

The population in this study were all X grade students of SMA Negeri 1 Tanggul, totaling seven classes. Specifically, class X1 has 30 students, class X2 has 30 students, class X3 has 30 students, class X4 has 31 students, class X5 has 32 students, class X6 has 29 students, class X7 has 32 students. The overall student population consists of 214 people. The experimental and control groups were not selected randomly, but by calculating the average score of the history subject Midterm Examination among the seven classes to be assessed for homogeneity. Determining which class will be used as a study group uses a homogeneity test to assess whether or not the population variants are the same by examining the average results of the midterm exam which are almost the same. The use of 2 classes in this study included class X1 as the experimental class and class X2 as the control class.

3.2 Research Design

This study used a quasi experimental design. This study uses a pretest-postest, nonequivalent group design which is a type of quasi experimental design. Quasi experimental design research involves the use of experimental groups and control groups, as stated by (Creswell, 2018). In this method, the selection of experimental and control groups is non-random and involves complete pre-existing groups, such as classrooms. The experimental group will get learning by utilizing augmented reality technology, while the control group will get learning by using YouTube videos as a learning tool. Furthermore, both classes are given questionnaires to determine the motivation of students to learn.

The pretest-posttest, nonequivalent group design can be seen in the following table:

Table 1 Research Design pretest postest nonequivalent control group design

Group	Pre-test	Treatment	Post-test
Experiment	O1	X1	O1
Control	O2	X2	O2

Description:

O1: Pre-test questionnaire learning motivation

X1: treatment with augmented reality media

X2: treatment with video learning media on YouTube

O2: Post-test learning motivation questionnaire

Data were obtained from the results of the pre-test and post-test learning motivation questionnaires in the experimental and control classes. Both groups were given a pre-test and questionnaire related to learning motivation before treatment. Both groups were given different learning media treatments, namely augmented reality learning media with a STEAM approach to the experimental class and video learning media on YouTube for the control class. Furthermore, both groups were given a post-test with the same learning motivation questionnaire to see if there were variations in motivation after treatment.

3.3 Research Instruments

The researcher adapted a questionnaire from Keller's book (2010) and research implemented by Khan et al. (2019) the assessment of students' motivation in learning has been carried out using validity and reliability tests. This instrument is a measuring tool to determine how motivated students are in learning. Rating scale and questionnaire model are the instruments applied to measure students' motivation in learning. Respondents were asked to choose one of four answers: STS (Strongly Disagree), TS (Disagree), S (Agree), or SS (Strongly Agree). Each learner marks his/her choice with a mark (✓). Each item in the statement is scored on a Likert scale of 1-4. The aspects measured refer to four indicators, namely Attention, Relevance, Convidence, and Satisfaction.

3.4 Data Analysis

The hypothesis test used in this study is ANCOVA. Before using ANCOVA to test the hypothesis, regression homogeneity test was conducted using SPSS and F test. If the sig of the independent variable covariate is more than 0.05 (Sign > 0.05), then the regression homogeneity test attempts to ascertain whether there is a relationship between the covariate and the independent variable. The last assumption that must be met before applying the Ancova test to test the hypothesis is the linearity of the relationship between the covariates and the dependent variable or also called the linear test. The purpose of this assumption is to use the F test to see if there is a linear relationship between the covariates and the dependent variable (Montgomery 2013). If the probability value is smaller than the significant level, it is concluded that there is a significant linear relationship between the covariates and the dependent variable (Stevens, 2009). ANCOVA test is used to determine the effect of learning using augmented reality media with STEAM approach on students' learning motivation. Data were analyzed using ANCOVA using pre-test scores as covariates.

After all assumptions are met, hypothesis testing can be done using ANCOVA.

4. RESULTS OF RESEARCH

4.1 The Effect of Augmented Reality Media with STEAM Approach on Learning Motivation

The regression coefficient homogeneity test is performed before ANCOVA. If the variance of the independent variables and covariates is said to be the same, this can be known by the homogeneity test. Data is considered homogeneous if the independent variable and covariate have a significance value higher than 0.05. The use of SPSS 25 for windows, was carried out for the regression homogeneity test.

Table 2 Homogeneity Test Results Questionnaire Learning Motivation

Data	Type III Sum of Squares	df	Mean Square	F	Sig
Kelas * *Pretest*	0,107	1	0,107	0,005	0,944

(source: Primary data processed)

Based on the data displayed in table 2, it shows the results of the learning motivation homogeneity test with a significance value (0.944> 0.05). Given that the findings of the homogeneity test of the pretest and posttest of students' learning motivation are more than the significant level of 0.05 and are considered homogeneous, the assumption of regression homogeneity can be said to be fulfilled.

Linearity test is the last assumption test before conducting hypothesis testing. The linearity test was carried out using SPSS 25 for Windows to see if the covariates and the dependent variable had a linear relationship.

Table 3 Linearity Test Results Questionnaire Learning Motivation

Data	Type III Sum of Squares	df	Mean Square	F	Sig
Pretest	221,018	1	221,018	10,139	0,002

(source: Primary data processed)

Based on the data displayed in table 3, the linearity test of learning motivation has a significance value of 0.002 (0.002 <0.05). So it can be concluded that the linearity assumption is fulfilled. Thus, through the linearity test results the pretest variable has a strong enough reason as a covariate.

The use of hypothesis testing to respond and provide answers related to the formulation of research problems. ANCOVA (analysis of covariance) test will be applied with the application of SPSS 25 software to evaluate hypotheses based on pretest and posttest data from experimental and control classes. The pretest result is the covariate in the ANCOVA test, which is used to determine whether the means include two or more groups that are not significantly related. The Ancova test was used in this study to test the effect of YouTube media with the TPACK approach in the control class and Augmented Reality media with the STEAM approach in the experimental class on students' learning motivation, with pretest scores as covariates. The decision-making process of Ancova test is:

a. A significant value greater than 0.05 indicates the acceptance of H0 and the rejection of Ha.
b. A significant value of less than 0.05 indicates the rejection of H0 and the acceptance of Ha.

Table 4 Test of Between Subject Effect Results of Learning Motivation

Tests of Between-Subjects Effects

Dependent Variable: Postest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	975.480[a]	2	487.740	22.772	.000	.444
Intercept	3242.316	1	3242.316	151.379	.000	.726
Pretest	240.480	1	240.480	11.228	.001	.165
Media Pembelajaran	425.191	1	425.191	19.852	.000	.258
Error	1220.853	57	21.418			
Total	636678.000	60				
Corrected Total	2196.333	59				

a. R Squared = .444 (Adjusted R Squared = .425)

(source: Primary data processed)

Table 5 Effect Size Criteria

Value	***Effect Size***
0,01	*Small Effect*
0,06	*Moderate Effect*
0,14	*Large Effect*

(Source: Cohen: 1998)

Table 4 presents the results of the ancova test to determine the effect of learning media on student motivation. The results in the corrected model column show a significance value of 0.000 (0.000 <0.05), so simultaneously the pretest and learning media have an influence on student learning motivation. Furthermore, the results of the learning media column show a significance value of 0.000 (0.000 <0.05) so that H0 is rejected and Ha is accepted, the conclusion is that there is a significant effect of the application of augmented reality learning media with a STEAM approach to student learning motivation in history subjects. The magnitude of the effect of learning media on student learning motivation can be seen in the partial eta squared column which shows a value of 0.258 included in the large effect category.

Table 6 Estimates Marginal Means of Learning Motivation

Estimates

Dependent Variable: Postest

MediaPembelajaran	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Kelas Eksperimen (Augmented Reality)	105.647[a]	.869	103.906	107.388
Kelas Kontrol (Youtube)	100.019[a]	.869	98.278	101.760

a. Covariates appearing in the model are evaluated at the following values: Pretest = 86.88.

(source: Primary data processed)

Table 6 shows the results of estimated marginal means in the experimental class of 105.647 which applied augmented reality media with the STEAM approach. While the results of estimated marginal means in the control class amounted to 100.019 which was applied to YouTube media with the TPACK approach. So it can be concluded that augmented reality media with a STEAM approach has more effect on student learning motivation than YouTube media with a TPACK approach.

5. Discussion

ANCOVA testing in this study shows the results that augmented reality learning media with a STEAM approach has an influence on student learning motivation. Augmented reality (AR) is a technological merger of real and virtual objects in real time, including virtual objects in three-dimensional form (Kaliraj et al., 2021;Azuma et al., 2001). In addition, it is said that augmented reality not only includes visual perception but also includes other senses including hearing and touch. Real and virtual components are integrated to enable interaction between humans and virtual environments (Billinghurst et al., 2001), as well as Ozkan et al., (2021) opinion that STEAM education consists of learning experiences, which increase their motivation to learn and build links between real life to arouse learners' interest and effective learning processes. The use of augmented reality learning media with a STEAM approach can increase students' learning motivation in the learning process with its various advantages.

Although both groups used the same learning model, the experimental group used AR media while the control group used Youtube media. However, the results showed that both groups showed a significant increase in learning motivation after using different learning media, which means that the learning media can increase students' learning motivation. . This result shows that for both groups, the use of words and illustrations can help learners' learning as described by the multimedia design principles of multimedia learning theory. Çimer (2012) also suggests that for effective biology learning, it is necessary to use visual teaching and learning materials and tools such as pictures, models, computer simulations, videos, 3D materials, and real-life objects. Previous research has shown that students remember concepts best that are presented in ways that relate to their sensory channels, e.g. audio and visual representations, images, charts, models and multimedia. For example, teaching with visual materials can provide more concrete meaning, show connections between ideas, and also make learning more interesting for students.

There was no significant difference between the two groups' overall learning motivation. This means that the use of AR technology can be as effective as the use of Youtube media. However, a metaanalysis conducted by oleh Su et al., (2022) states that Augmented Reality technology integrated with STEAM improves students' learning performance and motivation. Learners become motivated in the learning process through the STEAM approach by using augmented reality learning media. The reasons that support the use of AR in learning include The use of augmented reality media in learning attracts learners' attention so that it can overcome learning difficulties because it is not only a theoretical explanation but also can visualize events (Liu et al., 2023; Low et al., 2022; Zhang et al., 2023; Akçayır et al., 2017; Khan et al., 2019; Remolar et al, 2021). It can be said that augmented reality environments in education are preferred, mainly because of the perfect interaction of reality with virtual.

Augmented reality media integrated with STEAM approach has been proven to significantly increase learning motivation in history learning. By providing immersive and interactive experiences, cross-disciplinary integration, problem-solving opportunities, and personalized learning, AR and STEAM can foster a deeper appreciation of historical events and encourage learners to engage more actively in the learning process. The results of this study reinforce theoretical studies and previous research stating that STEAM is seen as a cross-curricular collaboration as an integration of the arts into the STEM curriculum that provides pathways for personal meaning making and self-motivation (Garza et al., 2019). Research by Kaliraj et al., (2021) states that the use of Augmented reality in an educational environment increases motivation and encourages independent learning. Research. Based on the explanation above, it is concluded that augmented reality learning media with a STEAM approach has a significant effect on student learning motivation in history subjects.

6. Conclusions

This study integrates Augmented Reality media with STEAM approach for junior high school students and investigates the effect of the learning media on learning motivation in history learning. The study found that augmented reality significantly increased learning motivation. Thus, augmented reality media may be potentially useful in motivating learners' learning. The results also showed that augmented reality media significantly increased learners' learning motivation in history learning. In addition,

as shown by the questionnaire data, learners enjoy using augmented reality media.

Based on the results of research on the Effect of Augmented reality Media with STEAM Approach on Learning Motivation, the researcher provides several suggestions including: (1) Students can use augmented reality media to understand and carry out fun history learning; (2) History subject educators and prospective history subject educators are expected to expand their knowledge and insights in the use of educational media in order to improve student learning and make it more interesting; (3) Schools are expected to use augmented reality media to improve the quality of learning; and (4) It is hoped that further research on the use of augmented reality media can be developed by other researchers.

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