The Effect of STEM-based History Podcast Media on Literacy in Digital Era through ICT Courses for History Education Students

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Abstract

Only now has learning by mainstreaming authentic educational skills yet to exist. By following mechanical advances, learning media are increasingly diverse, including web transcription media that can be used as learning media in the classroom. Authentic digital recordings with STEM awareness so that learning can begin in a multi-teacher manner to prepare students for demonstrable proficiency abilities. This study aims to determine the effect of using STEM-combined verification digital broadcast media on the verification abilities of students in ICT courses. The strategy used in this exploration is a semi-exploratory technique using a quasi-experimental nonequivalent control group design with two classes: a control class and an experimental class. Based on the analysis of the information obtained, the test value of the habit test (pretest-posttest) obtained an x^2_{table} value of 11.07 with a significance level of 0.05. The experimental class pretest x^2_{count} value was 10.92, the control class pretest x^2_{count} was 0.87, and the experimental class posttest x^2_{count} value was -18.81. The control class posttest x^2_{count} value was 4.22, the pretest-posttest data homogeneity test results obtained a F_{table} 1.73 with a significance level of 0.05, the pretest F_{count} value was 1.31, and the posttest was 1.57. The posttest data showed that the t_{count} value of 3.32 was not the same as the t_{table} value of 1.67, so Ho was rejected. H1 was accepted. STEM-based historical podcast media influences historical literacy skills in ICT History Education students.

Keywords: Podcast, STEM, Historical Literacy

INTRODUCTION

In the 21st century period, innovation is developing rapidly in Indonesia. Mechanical advances also affect the human age; the age that dominates this century is known as the millennial age (Budiati et al., 2018); according to Kilber, Barclay, and Ohmer as the age brought into the world when rapid technological advances provide qualities to the millennial age, especially the internet-dependent age which causes a lack of direct socialization, lack of time to exercise, have courage, self-confidence and a high sense of resilience (Madiistriyatno, 2020).

Further education as an educational organization is expected to be able to produce quality alums. This is important to improve and adapt to current developments, especially to the millennial era, which is currently the usual training goal. The millennial generation is ready and able to utilize innovation intelligently, and the application of innovation in education is very important (Afif, 2019).

The Digital Learning Ecosism behavior pattern is another harmony between educational entertainment and mechanical specs, which are then assimilated into these innovative specs.

This is following the ICT course, which is one of the mandatory subjects that must be taught by history education students at the Ageng Tirtayasa Government College; the ICT course is very closely related to data and correspondence innovation so that it can study scientific combinations through networks. , fuss, complexity hypothesis. Furthermore, self-association (Nurivana & Liana, 2022) can be used as a learning resource to acquire historical literacy skills.

Verifiable education is the capacity to manifest whether it is reading or conveying authentic reality. Verifiable signs of proficiency are needed to measure authentic educational ability, including information about the verifiable substance, reasonable thinking, use of authentic techniques, verifiable attention, understanding, and dominance of authentic teaching materials (Rahman & Winarsih, 2021). Table 1 shows the indicators of historical literacy.

Table 1. Indicators of Historical Literacy

Indicator	Description
Historical Knowledge	The ability to remember and/or know historical events that have occurred.
Conceptual Understanding of History	Understanding historical concepts includes aspects of time, cause and effect, change, and continuation of historical events.
Source Work/Historical Method	The ability to understand historical sources, analyze historical sources, and manage historical sources by tracking or searching for information, which is then compiled into historical facts themselves.
Historial Consciousness	Understanding the importance of studying history to bridge between the past, the present that is happening, and the future that will happen or the future by evaluating the values of historical events.
Historical Language	The ability to analyze and understand the meaning of history to obtain historical information itself using clear and concise language.

However, advancing by mainstreaming authentic education has yet to be present in current learning, for example, the use of learning media, which still needs to support demonstrable skills. The learning media should be adapted to current developments; podcast media could be another option. Podcasts are sound media containing data that can be noticed without a problem. Podcasts allow students to describe the material they will study more effectively and quickly so that the material is ready for further conversation by students (Mayangsari & Tiara, 2019). In addition to podcasts, STEM-based learning is carried out to introduce learning in a multidisciplinary degree. Next is a sign of learning media with aims that tend to be practical (Fitriyaningrum & Alrianingrum, 2023). Table 2 shows the indicators of learning media.

Table 2. Indicators of Learning Media

Indicator	Description
Valid	The material or content contained in learning media has an actual nature so that it can provide benefits in the future. The material or content focuses on discussions using language that is easy to understand so that the material or content can be conveyed well and can be understood by users.
Usefulness	The material or content must contain information that can be taught or be related to the information or material that will be discussed or is being discussed.
Attracting Interest	The concept of learning media must have language content that is easy to understand with the aim that the material can be conveyed and seen well by media clients.

Some circles have added the Work discipline to it to become STEM. Starting with Like, STEM is a process that consolidates these four disciplines in a planned way into problem-based learning techniques and events focused on regular settings. STEM-based domination techniques apply data and skills together to handle a case. This approach is described as a 21st-century learning approach that aims to make mental, psychomotor, and internal human resources unmatched. STEM has been discussed in America since the 1990s and should be created (Srigati, 2020).

As described by Torlakson (2014), the thinking of the four STEM areas is science (science) providing data to students about standards and thinking that apply in nature; Technology (development) is a skill or system used in managing social order, affiliation, data or plans and using fake gadgets that can work with work; Engineering (planning) is data for working or planning a method for managing a problem; Mathematics (arithmetic) is a science that deals with numbers, numbers, models and space which only requires reasonable contradictions without or accompanied by observational evidence. Organizing STEM learning will help students manage relevant and realistic problems in a much broader and more meaningful way.

In addition, Tsupros et al. (2009) describe the STEM approach as an interdisciplinary approach to learning where various thoughts are combined/associated with real events when students apply science, progress, order, and mathematics in settings that connect schools, environments, climate with the definitive aim to encourage STEM education capacity further and compete in the new financial business sector (Sakti et al., 2022). STEM learning provides the opportunity to look at certifiable issues in a coordinated manner based on the disciplines of science, technology, engineering, and mathematics (Dugger, 2010). This STEM learning can be recognized in existing learning media to obtain Verifiable Proficiency abilities.

Looking at the explanation of the problem of verification of skills related to the ups and downs of learning media and innovation, STEM-based web recording media can be the answer. Interest in this issue encourages scientists to direct research because of the digital recording of verification prepared by STEM media about proficiency abilities in the computerization era for ICT course students in history education.

METHOD

The method in this research uses semi-exploratory quantitative techniques using a Quasi-Experimental Nonequivalent Control Group examination plan, which consists of two classes, namely the control class and the trial class. The experimental class is treated using STEM (X)-based digital history learning media, while the control does not. Next, a final measurement (posttest) was given to the two cases to determine the impact of the completed treatment (Sugiyono, 2016).

Two factors in this review, especially podcast media, can be verified as STEM-based as independent factors that influence authentic proficiency abilities as the dependent variable. In learning research, experimental class learning was carried out using STEM-based historical digital recording learning media, whereas it was not in the control class. After being given treatment in the control and experimental classes, decisive reasoning ability was estimated using a poll adapted to verifiable educational clues, especially information about authentic substance, understanding of ideas, use of authentic techniques, verifiable mindfulness, understanding and dominance of material authentic history education material.

The testing method for this review uses a purposive examination procedure. Information collection in this research utilized opinion polls and documentation. The public sentiment assessment used in this research reviews changes in indisputable instructive values, while documentation is carried out by taking existing information such as schedule information and student participation.

RESULTS AND DISCUSSION

Observation Analysis of Learning Implementation

Scientists collecting research information are used to dealing with conditions when collecting information, meaning that the material used in exploration is adapted to the material taught when the examination is carried out. Learning exercises consist of opening exercises, middle exercises, and closing exercises. To determine the implementation of learning impulse perception learning exercises, learning was carried out by utilizing authentic STEM-based podcast media for trial classes. Next is the side effect of multiple perceptions regarding the implementation of the use of verified STEM-based digital broadcast media.

Table 3. Observation Results of Learning Implementation

Learning Activities	Percentage (%)	Category
Introduction	85%	Very Good
Core	97.5%	Very Good
Closing	90%	Very Good
Mean	91%	Very Good

Based on Table 3, we got a score of 85.0% using STEM-based webcast media in the introduction. In the core learning, we got a score of 97.5%, and in the closing activity, we got 90.0%. Then, based on the scores obtained, the level of learning implementation using authentic STEM-based web recording media was 91% in the Superior class.

Estimates regarding student reactions to using STEM-based verifiable podcast media were given exclusively to the trial class that received treatment. Completing the survey is expected to determine student reactions to using STEM-based digital recording media in learning so that the student reaction poll is filled in for the experimental class of 37 students. Next is Table 4 an examining student reaction polls regarding using verifiable STEM-based web recording media in learning.

Table 4. Analysis of Student Responses

Indicator	Percentage (%)	Category
Validity	85%	Very Good
Usefulness	77.5%	Good
Interest	80%	Very Good
Average	81%	Very Good

Table 4 shows the results of examining student reaction surveys. It tends to be reasonable that the use of STEM-based verified podcast media as a sign of the validity of STEM-based verified podcast media received a score of 85 %, for signs of ease of STEM-based authentic digital recording media, the level was 77.5 % earned, and an 80% rate for students' signs of interest in STEM-based verifiable digital broadcast learning media, with a typical STEM-based original webcast Media achievement of 81% in the General Excellent achievement classification.

The test instrument in this review is used to determine the impact of using STEM-based verifiable podcast media; the things in the test instrument used have been adapted to signs of authentic education so that it can be used to measure verifiable proficiency, the test is given in trial and control classes such as Generally, the main test is given before the treatment (pretest) and a follow-up test is given after the treatment is completed, especially using authentic STEM-based digital recording media in learning in experimental classes. Next are the results of achievement level tests against verifiable educational markers.
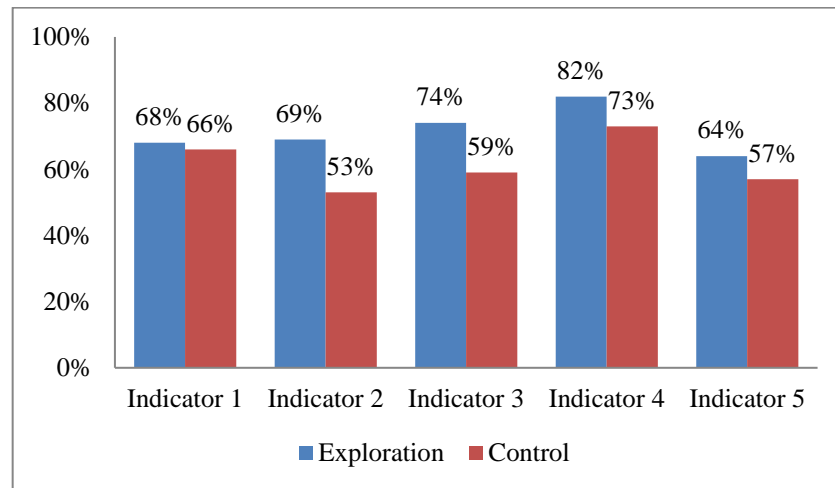
Figure 1. The results of achievement level

Figure 1 shows the percentage of achievement of historical literacy indicators based on the posttest results of the experimental class and control class after carrying out pick-up using STEM-based historical podcast media. Indicator 1, historical knowledge, was obtained in a percentage of 68% with a decent class for the experimental class and 66% with a large class for the control class. Indicator 2, understanding historical concepts, obtained a percentage of 69% with a decent class for the experimental class and 53% with a large class for the control class. Indicator 3, historical sources obtained a percentage of 74% with a decent class for the experimental class and 59% with a large class for the control class. Indicator 4, historical awareness, obtained a percentage of 82% with a decent class for the experimental class and 73% with a large class for the control class. Indicator 5, historical language, obtained a percentage of 64% with a decent class for the experimental class and 57% with a large class for the control class. The achievement percentage of historical literacy indicators above shows that learning material presented using STEM-based historical podcast media in learning can produce students' historical literacy competencies well.

Table 5. Normality test

History Literacy Test Results		Statistics			Conclusion
		x^2_{count}	df	x^2_{table}	
Pretest	Experimental class	10.92			
	Control class	0.87	0.05	11.07	Normally distributed
Posttest	Experimental class	-18.81			
	Control class	4.22			

Based on the Table 5, the x^2_{table} value was 11.07 with a significance level of 0.05. The pretest x2 calculated value for the experimental class was 10.92, the pretest x^2_{count} value for the control class was 0.87, the posttest x^2_{count} value for the experimental class was -18.81, and the control class posttest x^2_{count} value 4.22, the normality test criteria using the chi-square formula

is if x^2_{count} is smaller than x2table then the data is normally distributed so the data can represent the population, then a homogeneity test is carried out.

Table 6. Homogeneity test

History Literacy Test Results	F_{count}	df	F_{table}	Conclusion
Pretest	1,31	0,05	1,73	Homogeneous
Posttest	1,57			Homogeneous

Table 6 shows the analysis results of the pre-test-posttest data homogeneity test, which obtained F_{table} 1.73 with a significance level of 0.05, a pre-test F_{count} value of 1.31, and a post-test value of 1.57. The homogeneity test category uses the F_{count} formula, so the data is homogeneous, meaning that the control and experimental class data have the same characteristics as the population.

After the investigation results, the information is stated to be conveyed normally and homogeneously, and then the suspicion test is carried out using the t-test. Next are the consequences of the t-test investigation to test the proposed speculation.

Table 7. T-test

Test	t_{count}	df	t_{table}	Conclusion
T-test	3,32	0,05	1,67	There is effect

Based on Table 7 shows that the t_{count} value of 3.32 is not the same as the t_{table} value of 1.67, so Ho is rejected. H1 is accepted with the hypothesis that the use of STEM-based historical podcast media influences students' historical literacy abilities in ICT courses. The influence of using STEM-based historical podcast media on historical literacy. The analysis results show that the use of STEM-based historical podcast media has an influence on historical literacy skills, especially in the current digital era, where information is very easy to obtain. Still, the truth cannot be proven, so careful processing or selection is needed to believe the information.

The achievement of historical literacy skills using STEM-based historical podcast media can be seen from the students' achievement in answering tests adapted to historical interstellar indicators. Indicator 1 students can provide answers by recalling historical events that have occurred in the past. This is shown by obtaining a percentage of 68% in the good category, indicator 2, students' historical literacy abilities can be proven by answering question number 2, students can provide answers related to the concept of time and causality in history which reflects an understanding of historical concepts, also supported by obtaining a percentage of 69% with good category, indicator 3, students have historical literacy skills as shown by the students' success in answering question number 3 by being able to understand, analyze and manage a historical source to then use it as historical fact, this is also supported by the acquisition of a percentage of 74% in the excellent category , indicator 4, students are able to

have historical literacy skills as proven by successfully answering question number 4 related to understanding the importance of studying history and the values contained in historical events themselves, supported by a percentage of 82% in the very good category, indicator 5, students are able to have historical literacy skills by successfully answering question number 5 by being able to analyze and understand terms from historical events so that information related to history itself is obtained which is then explained in concise and clear language, supported by the acquisition of a percentage of 64% in the good category.

Using podcasts as a learning medium has indirectly encouraged students to enter the Digital Learning Echoism behavior pattern, a new balance between educational actors and technology specs, which are then internalized in the technology specs. This is demonstrated using historical podcast media with the material or content in it structured based on STEM learning so that the material taught can cover multiple multi-disciplines so that students can think more logically, and historical literacy skills enable students to be more careful in retrieving or believing information easily, especially in today's digital era.

CONCLUSION

STEM-based historical podcast media significantly influences students' historical literacy skills, especially in the digital era. The provision of statistical investigation demonstrates these results with a t_{count} value of 3.32, which is not the same as a t_{table} value of 1.67 with a significance level of 0.05. So, hypothesis H_1 is accepted, so it can be concluded that STEM-based historical podcast media influences students' historical literacy abilities in the digital era in ICT courses. Podcast media indirectly builds a digital learning echoism mindset by applying technology in the learning process, which can then be utilized as a learning asset in educational experiences.

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