History Learning Innovation with Steam Approach

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Abstract

So far, history lessons are only textual in nature. For this reason, teachers must start preparing students to face the rapidly changing technological developments. Meanwhile, the need for human resources in the future is to be able to think analytically, collaboratively, and interdisciplinary. For this reason, this research will raise the application of STEAM through Project Based Learning as an innovation in learning history. Researchers use qualitative methods. First, reflection aims to bring students into the context of the problem and provide inspiration to students. At the research stage, more learning processes occur. In this stage, the teacher also guides the discussion more and determines whether students have developed conceptual and relevant understanding. The discovery stage connects research and information known in project preparation. Students begin to study independently and determine what is still unknown. At this stage, the students collaborate to find solutions. At the application stage, students test products made from previously determined conditions. The results obtained are used to improve the previous step. The final step is communication. The communication process is carried out to convey ideas. At this stage, the teacher and colleagues conduct a final assessment. In addition, teachers are also expected to be able to provide appreciation and constructive feedback. The results showed that STEAM in Project Based Learning for history learning proved to be effective in encouraging students' creativity, collaboration, and communication skills. However, this method requires careful planning. Some students are also not familiar with project learning.

INTRODUCTION

History is a valuable science to shape character. Various events in history can evoke emotions and ideals so that life becomes more meaningful. Thus, learning history should be able to hone students to think critically. Historical sources are expected to make history lessons relevant and useful for students (Rowse, 2014; Widiadi, Sheehan, & Shep , 2022). Historical learning so far has only been textual. Students only learn what is written in the textbook. This makes learning history considered less relevant and less meaningful.

In fact, the United Nations emphasizes the importance of education so that students can think (learning to think), be able to do or do something (learning to do), and can live their lives as a person as they want to be (learning to be), and learn to live together with others. other people (learning to live together). That is, learning as the main activity of education requires the active involvement of students. Active involvement of students can be done through project-based learning. The project-based historical learning model

emphasizes the active involvement of students in the process of learning activities, so that students are able to solve problems and provide opportunities to work autonomously to construct their own learning, and ultimately produce valuable and realistic student work products (Trianto, 2017).

The current generation of students has a character that is dependent on applications, and is always connected online. They are so quick to receive and share information through social networks. They are self-learners who always seek the knowledge they need through the available platforms. They are also very data literate, so they are good at surfing search engines to extract, process and analyze information. They are more comfortable learning collaboratively in real projects or peer-to-peer approaches through communities or social networks (Mulyani, 2020). For this reason, teachers must start preparing students to face the rapidly changing technological developments. Meanwhile, the need for human resources in the future is to be able to think analytically and collaboratively.

Minister of Research and Technology/Head of the National Research and Innovation Agency, Prof. Bambang Permadi Soemantri Brodjonegoro, said STEAM was a way of educating in the Industrial Revolution 4.0 era. The STEAM (Science, Technology, Engineering, Arts, Mathematics) learning method is one of the important keys to the world of education in facing the Revolution 4.0 era. STEAM can encourage the development of science, technology, engineering, and mathematics to be more creative (Prodjo, 2020).

Based on a literature review, STEAM learning only concerns science-based subject matter. For example, physics, mathematics, and chemistry lessons (Lestari, 2021; Pujiati, 2020; Nurhikmayati, 2019). In addition, the existing research is limited to elementary school students and early childhood age groups (Nuragnia & Usman, 2021; Imamah & Muqowim, 2020). Therefore, this research will raise the application of STEAM through Project Based Learning as an innovation in learning history.

METHODS

In this section, the researcher explains the research method to be used. This research will use qualitative methods. Qualitative research focuses on how people interpret their life experiences (Lune & Berg, 2017). In this study, researchers observed directly in class and analyzed documents related to existing concepts. The determination of the research sample is based on purposive sampling, which is determined based on the research objective. The object of research here is the total number of students in class XI IPS I at SMAN 29 Jakarta. Data collection was conducted from January to June 2023.

In compiling the research framework, the researcher used the theory from Laboy-Rush in (Zuryanty, Hamimah, Kenedi, & Helsa, 2021). The following are the stages of the STEAM approach through project-based learning:

a. Reflection, students connect the material with their prior knowledge. Students are brought into the problem and given the motivation to solve the problem.
b. Research, students find other information from relevant learning resources both online and offline.
c. Discovery, students synthesize information and see what is not known. Students begin to discover the learning process.
d. Application, students apply models and solutions to solve problems in groups. The goal is to build collaboration capabilities.
e. Communication, students present the models & solutions that have been made. The goal is to build communication skills and be able to provide constructive feedback to other students.

The stages of this research were carried out as follows. First, the researcher observed how the history learning process had been carried out so far. Then, identify the needs of students. Next, developing a STEAM-based historical learning model design. The next step is to develop a STEAM-based learning model and develop its syntax. Finally, implementing a project-based learning model based on STEAM history lessons.

Finally, researchers also ensure the validity and reliability of qualitative research with saturation and triangulation. Saturation is a criterion for assessing when to stop sampling data in the absence of additions that can develop research-related categories (saturation). Triangulation is data validation through cross-verification by comparing data with different methods to strengthen research arguments (Malhotra, Nuna, & Birks, 2017).

RESULTS & DISCUSSION

In the 2013 curriculum the approach applied is the scientific approach. Students are expected to be able to observe, ask questions, gather information, reason, and communicate. One of the learning models in the 2013 curriculum is project-based learning.

Project-based learning is an activity that uses projects to gain attitude, knowledge and skill competencies. The emphasis on learning lies in the activities of students to produce products by applying the skills of researching, analyzing, creating, and presenting learning products. The product here is the result of the project in the form of writing, artwork, designs, prototypes, crafts, and others (Banawi, 2019).

The application of STEAM is done by integrating it into the learning process. STEAM is an interdisciplinary approach combining the five elements of Science, Technology, Engineering, Art and Mathematics. These five elements are integrated, so that learning history is not only studied from one field of knowledge, but is integrated and interdisciplinary.

In learning history, the STEAM context can also be integrated into learning history in terms of hard skills. Science, is a history learning activity that utilizes the environment as a source of learning through research and development. Technology in general relates to tools, objects and machines that are created to help and facilitate humans in solving problems encountered in everyday life. The use of technology can be studied starting from the origin of the discovery of technology to its development in accordance with the times. Engineering, is a way of doing or problem-solving techniques, using various materials, designing and creating and building something that can be used. Some historical relics are in the form of artifacts, which are the result of human taste, creativity and works in the past that have art. The mathematical element in history is the ability to count in a broad sense, including reading the numbers contained in documents. In addition, history is a science related to time, so it takes the ability to count years related to certain historical periods, this can encourage students to have the ability to analyze time according to the context of the spirit of the era (Zeitgeist) (Kuntowijoyo, 1997).

On the other hand, in terms of soft skills, the science aspect is related to the ability to understand and process information. The technology aspect is associated with students' ability to use technology to facilitate their lives. The engineering aspect means the skills of making, assembling, and operating something. The mathematics aspect means the skills of analyzing, problem solving, and interpreting (Zuryanty, Hamimah, Kenedi, & Helsa, 2021).

History Lesson STEAM Activity on Project Based Learning
1. **Basic Competency**
   a. Write down the roles and values of the struggle of national and regional figures who fought to maintain the integrity of the Indonesian state and nation in the period 1945 – 1965.
   b. Evaluate the roles and values of the struggle of national and regional figures in maintaining the integrity of the Indonesian state and nation during the 1945-1965 period.
2. **Learning Objectives**
   a. Through audiovisual media, students are able to understand and empathize with the struggles of national figures.
   b. Through presentations, students are able to accurately report the results of discussions about the struggles of national figures orally and in writing.
   c. Through project activities, students can practice creativity and innovation on wooden frames correctly.
3. **Learning Outcomes**
   A wooden frame product containing photographs and profile information (brief biographies) of national struggle figures during the Proclamation Period of the Republic of Indonesia.
4. **Skills**
   Process skills, communication, collaboration, critical thinking, logical thinking, and creative thinking.
5. **Assessment**
   a. Teacher (likert scale 1-5)
   b. Colleagues (likert scale 1-5)
6. **Syntax Learning**

Table 1. Learning Syntax

No	Stages of Project Based Learning	STEAM content	Teacher Activities	Student Activities
1	Initial activity		a. Greetings b. Prayer c. Presence d. Ask students to name national and regional figures they know.	a. Greetings b. Prayer c. Presence d. Listening and understanding
2	Reflection	Science: Sort out information that is already known and needs to be searched more deeply	a. Opened student schemata about the struggles of national and regional figures in the proclamation era b. Presenting problems by showing students related documentary audiovisual media (video). c. The teacher explains the problem raised as the theme/topic of the project that students will work on.	a. Observing teacher delivery. b. Participate actively in the activities presented by the teacher. c. Listening to the documentary video played by the teacher. d. Understand LKPD

				d.	The teacher distributes Student Worksheets (LKPD) to students which are a reference in project implementation.		
3	Research	Technology: Find additional resources relevant to the project online (search engines, ebooks, journals)	a.	Ask students to understand the project to be implemented.	a.	Students understand the project
			b.	Ask students to find sources of information related to the project.	b.	Analyze the solutions to the problems presented.
			c.	Facilitating students to design product planning in the form of wooden photographs of freedom fighter figures.	c.	Taking inventory of National and Regional Figures who want to be appointed in the project
			d.	Students are given the freedom to choose whether they are warrior figures around their area or national figures.		
			e.	The teacher explains the tools and materials prepared to make wood photos: tools (laptop, printer, saw, scissors, hairdrayer) and the materials needed (1. wooden planks, the type of wood chosen is wood that has a white color so that when the attached image can be seen clearly, 2. Rice Paper, wood glue, sandpaper, sponge (foam)		
4	Discovery	Science: Process biographical information on national figures from sources that have been collected. Checking the correctness or validity of data	a.	Form 5 to 6 groups and ask students to sit in groups	a.	Students prepare the tools and materials needed for the project.
			b.	Facilitate students to carry out projects through LKPD.	b.	Conduct group discussions to determine the best design for each student.
			c.	Help prepare the tools and materials needed by students.	c.	Determine the schedule and division of tasks.
					d.	Process biographical

		processing results				information sources (Name, Place, Date of Birth, and Services of Figures from search engine search results.
5	Application	Engineering: Integrated in the process of making projects, producing works/products. Art: Make products as attractive as possible and have artistic value.	a. b. c.	Facilitating students in carrying out activities. Helping students when there are problems. Recall aspects of completeness of the project.	a. b. c.	Collaborate in project completion. Recording of every activity carried out. Make the product as attractive as possible
6	Communication	Art: Communication during presentations in a creative way so as to attract the audience's attention. Maths: Interpret the projects that have been made by each group.	a. b. c. d.	Conducting process assessment and learning outcomes. Provide constructive feedback to students. Appreciate the product of student projects. Facilitate students to do peer assessments.	a. b. c. d.	Presenting projects that have been made. Deliver the results of the presentation in an interesting way to get the attention of the teacher and other groups. Convey insights gained from learning and the process of working on the project. Provide suggestions and input as well as assessments through peer assessment forms.

That is a series of STEAM integrated historical learning with project-based learning. Furthermore, there is an assessment of the learning model design for STEAM and an example of a peer assessment form that the researcher has created. Here's the table.

Table 2. Kisi-kisi penilaian desain model pembelajaran PjBl pendekatan STEAM

Components	Indicator
Innovative	Novelty
Effective	Achieve goals
Creative	Appropriate

Table 3. Form of Assessment Between friends

The name of the friend being graded :
Assessor name :
Class :

Check and fill in objectively. Assessment Guide:
1 = 51 – 60   3 = 71 – 80
2 = 61 – 70   4 = 81 – 90

Statement	Likert Scale				
	1	**2**	**3**	**4**	**5**
Pay attention when the teacher explains					
Give ideas or ideas during the discussion					
Look for information from books, the internet, or other sources					
Collaborative skill					
Project view					
Communication skills					
Efficient use of time					
Content suitability					

Criticism and Suggestions for other groups :
Advantages of Learning Methods :
Disadvantages of Learning Methods :

Finally, evaluation. The evaluation was carried out to measure the effectiveness of the STEAM approach project-based history learning. The instrument used was a questionnaire which was distributed to all students of class XI IPS 1, which totaled 36 students. From the incoming questionnaire data, the following data.

Table 4. Project Based Learning Results based on STEAM Learning History

No.	Advantages of Project Based Learning with STEAM	Disadvantages of Project Based Learning with STEAM
1	Arouse student activity because each has duties and responsibilities	Requires careful planning
2.	Growing creativity because given the freedom to make the desired product	Not all students are familiar with the project method

3. The teacher pays attention to the interests, talents and differences in students' abilities	It took quite a long time
4. Can foster cooperation	Requires a lot of equipment so it needs to be quite costly
5. Train student objectivity because they have to rate other friends	The project will be hampered if there are freeriders who are difficult to work with.

CONCLUSION

The STEM method is carried out by strengthening the background and basic abilities. Meanwhile, a creative side (art) must be needed to attract someone's interest. It can be concluded that learning is a process of discovery (inquiry) so that students gain knowledge and skills through their discovery (discovery).

From the various stages of integrating STEAM through Project Based in history learning it can be concluded as follows. First, reflection aims to bring students into the context of the problem and provide inspiration to students. At the research stage, more learning processes occur. In this stage the teacher also guides the discussion more and determines whether students have developed conceptual and relevant understanding. The discovery stage connects research and information known in project preparation. Students begin to study independently and determine what is still unknown. At this stage the students collaborate to find solutions. At the application stage, students test products made from previously determined conditions. The results obtained are used to improve the previous step. The final step is communication. The communication process is carried out to convey ideas. At this stage, the teacher and colleagues conduct a final assessment. In addition, teachers are also expected to be able to provide appreciation and constructive feedback.

STEAM in Project for History Learning is proven effective in encouraging students' creativity, collaboration, and communication skills. However, this method requires careful planning. Some students are also not familiar with project learning. Moreover, the project requires quite a lot of tools and costs. Apart from externals, projects can also be hampered if there are free riders.

On the other hand, this research is still limited to conventional projects. The project may be integrated digitally for further research, such as creating historical content. In the era of digital transformation and the development of social media, it seems that projects like this can be implemented and can be more useful and impactful. Of course, not only for students but also for the surroundings.

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