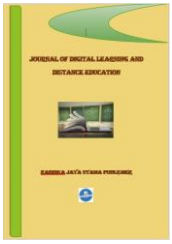

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The Effect of the Steam Approach on Student Social Science Learning Outcomes in Elementary School

Nofia HENITA[a*], Yeni ERITA[b], Deni Okta NADIA[c], Rahmi YULIA[d]

[abcd]*Basic Education Study Program, Universitas Negeri Padang, West Sumatera, Indonesia*

*Corresponding author: nofiafourth@gmail.com

Abstract

This research was motivated by the low learning outcomes of students in social studies learning. The purpose of this study was to determine the influence of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach on the learning outcomes of social studies students in elementary school. This study uses quantitative experimental methods. The results of the research obtained are the sig value. (2-tailed) of 0.001 < 0.05 which means Ha is accepted and H0 is rejected, this indicates that there is a difference in the average learning outcomes of control class students with the experiment class, meaning that there is an influence of the STEAM approach. Student learning outcomes using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach are higher than learning outcomes with conventional approaches. So that the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach has a positive impact on student learning outcomes because there is a significant influence on the learning of the social sciences that use this approach.

Keywords: STEAM Approach, Learning Outcomes, Social Sciences, Elementary School.

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Introduction

The curriculum in Indonesia is constantly changing. The curriculum changes that occur are improvements and adjustments to educational programs adapted to the community's demands, both the community around students and outside the student's environment (Ritonga, 2018). The needs of the community are always dynamic, so the needs of students also develop dynamically with the development of society. The ever-changing needs expect students to be familiar with

society. The needs of this dynamic society are also very influential on education, where there are meaningful changes so that students get what they need.

Judging from the dynamic changes in society, students have their stages of development in the learning process, and the way of learning is different. The statement is supported by research conducted (Desvianti et al., 2020; Safitri & Desyandri, 2020), where the level of human intellectual development affects maturity, physical experience, logical experience, social transmission, and self-regulation, and humans can know the existence of certain stages of development in the child's thinking ability at his level .

In this independent learning curriculum, students are independent in social science learning. The subject of Social Sciences is mainly the first year of implementing the independent curriculum (Puspitasari, 2012). Social Science learning is abstract; there is a concern about the shallowness of the knowledge taught. Social Science learning in the independent learning curriculum is no longer taught in the theme or arguably stands alone. Teachers only rely on teacher books and student books or often tell stories, so students need a long time to understand these materials (Ratri, 2018). Media can help students' difficulties in understanding the material in schools and learning resources to support student learning activities because thematic learning in Social Science learning that connects with other learning is not enough just to be oral or only rely on teacher books and student books; it is necessary to use diverse learning media.

Students in elementary schools are usually around 7-11 years old, and students need something real in the learning process or are concrete (Pratiwi, 2018). As stated in the Theory of cognitive development proposed by Piaget states, the concrete operational stage is the third stage of cognitive development, lasting from about the age of 7 to 11 years. Concrete operational thinking involves the use of operations. Logical reasoning replaces intuitive reasoning only in concrete situations (Anidar, 2017). At this stage, the child can logically do reasoning for things of a concrete nature, while things of an abstract nature are still not capable. The child is already able to classify concrete objects into different groups.

To support concrete learning, (Trianingsih, 2016) in their research, First, the teacher must care about the method or thought process of the child until a thought result is obtained in him. Secondly, the teacher must provide a variety of activities that allow for students' active involvement with initiative. Third, teachers should not emphasize learning activities that require children to think like adults. Fourth, teachers must care about the speed and level of cognitive development of each student in carrying out a lesson so that each student can learn optimally.

One learning approach that integrates several scientific disciplines is the STEAM (Science, Technology, Engineering, Arts, and Mathematics) learning approach (Arsy et al., 2021; Nurhikmayati, 2019). STEAM is the development of the origin of STEAM education by adding elements of art (Arts) to its learning activities (Riawati, 2022; Salsabila & Muhid, 2021). STEAM stimulates students' curiosity and motivation regarding high-level thinking skills, which include problem-solving, collaboration, independent learning, project-based learning, challenge-based learning, and research (Zubaidah, 2019). Learning activities that are appropriate for the STEAM approach are project-based (Project Based Learning). The use of dotted project-based learning comes from the assumption that problem-solving will only be complete if it is reviewed from various facets (Mu'minah, 2021). STEAM integration using a project-based learning model has successfully created soft skills for students who refer to 21st-century skills in the Social Science material.

STEAM, as a learning approach, is a means for students to create science and technology-based ideas through thinking and exploring activities in solving problems based on five integrated disciplines. Suppose problem-solving is carried out based on several disciplines. In that case, it will produce a very appropriate solution, not only solving mathematical problems but based on concepts related to other disciplines, so problem-solving will be very interesting, effective, and

efficient (Nurhikmayati, 2019). In the 2013 curriculum update that the government has set, students are expected to be able to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and practical and able to contribute to the life of society, nation, state and world civilization (Riowati et al., 2016) . The hopes and objectives of education in the 2013 curriculum can be implemented through a STEAM-based learning approach that offers meta-disciplinary education in developing thinking skills and creativity in solving problems (Hasanah et al., 2021) . This is in line with (Apriliana et al., 2018) , who state that STEAM integration will provide new opportunities for students to carry out the design learning process directly and produce products with good creativity and problem-solving skills. The purpose of this study is to determine the influence of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach on the learning outcomes of social sciences students in elementary schools.

Methodology

This study uses quantitative experimental methods (actual experimental design) & research design because it uses existing classes (Creswell, 2016). The population in this study was the first target class, and the second target class became an experimental class that was treated in the form of learning using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach. The third target class became a control class (Sugiono, 2014).

Midterm Assessment aims to find out the initial ability of students before being given treatment to have equality. The research design used was a questionnaire that made as many as 20 statements and four questions of description. Data collection was obtained. Before being used for research, the instrument is tested for validation and reliability to calculate validity by comparing the rating < r table then the test item is declared valid. The instrument reliability test is carried out internally by consistency; namely, trying the instrument is considered reliable if Alpha Cronbach > r table (Arikunto, 2010). This study uses the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach to achieving learning objectives.

Technically, in this study, there are three stages, namely the preparation, implementation, and final stages. The preparation stage consists of: a) Finding research samples, b) Compiling learning tools in the form of Learning Implementation Plans, Student Worksheets, and Learning media, c) Compiling research instruments, d) Validating instruments, e) Revising research instruments based on validity test results. The implementation stage consists of: a) Giving treatment to experimental classes, b) Providing questions to test students' self-confidence. The final stage consists of: a) Calculating the value obtained, b) Analyzing the calculated results using the t-test, and c) Writing a report on the results of the research ((Sugiono, 2007).

Results

Research hypothesis testing using SPSS software-assisted t-tests. Provided that: Ho: There is no influence of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach on student learning outcomes. Ha: There is an influence of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) model on student learning outcomes. The results of this study show that the value of sig. (2-tailed) of 0.001 < 0.05, which means Ha is accepted. This result indicates a difference in the average learning outcomes of control class students with experimental classes, meaning that the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach influences student learning outcomes. The STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach positively impacts student learning outcomes.

Table 1. T Test Results

Levene's Test for Equality of Variance			t-test for Equality of Means		
	F	Sig	t	df	Sig. (2-tailed)
Learning Outcomes					
Equal Variances Assumed	.225	.616	5.364	58	.0001
Equal Variances Not Assumed	60,12	1,12	5.364	57.297	.0001

There is a significant influence on Social Science learning using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach on student learning outcomes. Student learning outcomes with the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach are more effective and efficient than conventional learning that uses the lecture method and is only fixated on books without caring about quality and related basic concepts in everyday life (Noviati et al., 2020). This case shows that student learning outcomes increase if learning Social Sciences uses the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach. This means that the better the application of the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach, the higher and better the learning outcomes will be.

Discussion

Social Science is no longer a complex problem if the students' abilities are high enough sound. With that, students will be more interested, happy, and creative in learning Social Sciences. With the increase in student learning outcomes, students can do problems in the classroom and daily problems well. In line with the objectives of Social Science Education, The objectives of learning Social Sciences according to (Afifah & Rofiah, 2020) is 1) teaching the basic concepts of sociology, geography, economics, history, and citizenship through a pedagogical and psychological approach; 2) develop critical and creative thinking skills, inquiry, problem solving and social skills; 3) build commitment and awareness of social and humanitarian values; 3) improve the ability to cooperate and competence in a plural society, both nationally and globally.

In this independent learning curriculum, students are independent in social science learning. Social Science learning is abstract; there is a concern about the shallowness of the knowledge taught. Social Science learning in the independent learning curriculum is no longer taught in the theme or arguably stands alone; teachers only rely on teacher books and student books or often tell stories, so students need a long time to understand these materials (Desyandri & Vernanda, 2017; Pertiwi et al., 2017). Media can help students' difficulties in understanding the material in schools and learning resources to support student learning activities because thematic learning in Social Science learning that connects with other learning is not enough to be oral or only rely on teacher books and student books; it is necessary to use diverse learning media.

Learning using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach is considered exciting and efficient for creating a fun and non-tense learning atmosphere for students. This can also be seen in the average student learning outcomes in control and experiment classes. The results in the table above show that target class students have increased their self-confidence after being given STEAM (Science, Technology, Engineering, Arts, and Mathematics), able to prioritize student activities in the continuity of the Social Science learning

process, where students can increase the knowledge they already have about existing Social Science learning problems through daily activities students can find solving concepts problem.

STEAM, as a learning approach, is a means for students to create science and technology-based ideas through thinking and exploring activities in solving problems based on five integrated disciplines. Suppose problem-solving is carried out based on several disciplines. In that case, it will produce a very appropriate solution, not only solving mathematical problems but based on concepts related to other disciplines, so problem-solving will be very interesting, effective, and efficient (Nurhikmayati, 2019b) . In the 2013 curriculum update that the government has set, students are expected to be able to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and practical and able to contribute to the life of society, nation, state and world civilization (Riowati et al., 2016). The hopes and objectives of education in the 2013 curriculum can be implemented through a STEAM-based learning approach that offers meta-disciplinary education in developing thinking skills and creativity in solving problems (Hasanah et al., 2021). This is in line with (Apriliana et al., 2018), who state that STEAM integration will provide new opportunities for students to carry out the design learning process directly and produce products with good creativity and problem-solving skills. Student learning outcomes can provide an overview and information of students around us and provide solutions to meet the needs of life and solve daily problems. This ability is also able to assess a fundamental understanding of information.

Conclusion

Based on the research that has been carried out, this study compares the use of two learning approaches: learning with the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach and the conventional approach. There are differences in the level of confidence of students taught using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach and the conventional approach to target class students. Student learning outcomes taught using the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach are higher than those taught with conventional approaches.

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