STEAM'S APPROACH TO PRIMARY SCHOOL THEMATIC LEARNING

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Abstract

This research aims to provide information on the application of STEAM approach to primary school thematic learning. The application of STEAM approach includes aspects of learning planning, application of learning, and assessment of STEAM learning in primary school thematic learning. Qualitative approach with this type of case study research through observation. The data of the research results are processed with narrative through observation and verification techniques steps to produce credible conclusions. from these results it is known that STEAM's approach to primary school thematic learning has constraints in its application.

Keywords: *STEAM, Thematic Learning, Elementary School.*

A. Introduction

The 2013 curriculum is structured to improve the shortcomings of the previous curriculum. In the Graduate Competency Standards (SKL) Curriculum 2013 includes character education, active learning methodology, and a balance between soft skills and hard skills which includes three aspects, namely, cognitive aspects (knowledge), affective aspects (attitudes), and psychomotor aspects (skills) in general. integrated. The 2013 curriculum for SD/MI uses integrated thematic learning from grade one to grade six. This is based on the stage of development of elementary/MI age children, namely at the concrete, integrated, and hierarchical operational stage(Ulum, 2019).

Learning is one of the sub-systems of education in addition to the curriculum. The process is always learning that follows the development of the curriculum (Darna & Kemal, 2015). Learning is related to how to teach what is contained in the curriculum

(Kemal, & Nurbaya, 2017). With learning, the plans that have been made by the teacher can be realized in accordance with the goals that have been set (Limbong, Munawar and Kusumaningtyas, 2019).

STEAM (Science, Technology, Engineering, Art and Mathematics) learning is an approach in learning that involves students totally in exploring and understanding the substance of the meaning of the lesson being implemented. In this case, the educator acts as a facilitator and the students explore by collaborating in completing their learning tasks (Nurhasanah and Ms, 2021).

One of the lessons that can integrate several disciplines is the knowledge of the STEAM learning approach (Science, Technology, Engineering, Art and Mathematics). STEAM is a development of STEM education by adding elements of art (Art) in learning activities(Limbong, Munawar and Kusumaningtyas, 2019). STEAM has also been conceptualized as a transdisciplinary teaching and learning approach in which you start with a "problem or problem and, through the problem solving process, bring disciplinary knowledge that contributes to the solution or resolution." (Herro et al., 2017).

J.-M. Lee and Shin (2014) interviewed 25 elementary school teachers about the challenges they felt in teaching STEAM lessons. Common difficulties cited include reorganizing the curriculum and building STEAM lesson materials, guiding student group activities, conducting appropriate student assessments, and a conservative school climate. Overcoming these challenges experienced by teachers will be critical to the success of STEAM in schools (Kang, 2019).

Papproach to learning STEAM (Science, Technology, Engineering, Art and Mathematics). STEAM is the development of STEM education by adding elements of art (Art) in learning activities. STEAM stimulates children's curiosity and motivation regarding higher order thinking skills which include problem solving, collaboration, independent learning, project-based learning, challenge-based learning and research. learning activities that are suitable for the STEAM approach are project-based learning activities (Project Based Learning). The use of project based learning is based on the assumption that problem solving will not be complete if it is not viewed from various aspects (Mentari, 2018)

STEAM education is now recognized by many countries, and has been seen as the foundation of economic growth with design-based learning and creative innovation. To gain further insight into the current situation of STEAM education in the ASEAN region, a search on ACI using the search term STEAM education was conducted in February -March

2019. The search was limited to research on STEAM education with no limitation on the year of publication. This study helps science educators to understand STEAM education and its contribution to ASEAN countries. In addition, the results are a decision tool to advance STEAM education together in terms of its definition and extent. . The results are not only focused on quantitative reports but also on the STEAM learning process and successful information is also explored. (Nuangchalerm et al., 2020)

B. Method

This study uses a qualitative approach with the type of research that is a case study through observations about the STEAM approach in elementary school thematic learning. The research procedure produces descriptive data from people and behaviors observed in the classroom, namely planning, implementation, assessment, and efforts made by teachers to overcome obstacles in implementation. This research was conducted in class VA SD Negeri 2 Sumber Rejo Bandar Lampung City. The technique used in this research data collection is observation, interviews and documentation. The aspects studied were planning to implementing the STEAM approach in integrated thematic learning during the learning process, the results from observations were then recorded subjectively by the researchers.

C. Finding and Discussion

1. STEAM approach learning planning

Learning planning basically has to review the syllabus by looking at the KI and KD. Just go down to analyze the teacher and student books. this is so that there is no difference between the suitability of KD and KI in the material. This means that the relevance of the subject matter conveyed by the teacher must be in accordance with the KI and KD contained in the syllabus. This is indeed often a problem, almost every year there are innovations to the existing KI and KD, while the study guidebooks are still not updated according to the new KI and KD so that teachers also have to carry out assessments of KI and KD as well as study guide books to plan a lesson. . KI and KD which change every year of course intend to improve the quality and quality of learning in accordance with the developments and demands of the times that demand humans to be active and innovative, so that the curriculum develops in such a way. Basically, scientists in applying the scientific method still adhere to the basic concepts. The concepts in question are logical techniques, experimental techniques, principles,

evaluation standards, and ethical standards. The use of this concept is actually easier for the learning process to be improved by teachers and curriculum developers (Persada, Djatmika and Degeng, 2020).

In the lesson plan it turns out that it still refers to the teacher's book and uses the STEAM approach in its steps. The lesson plans are still being compiled with groups of teachers per school. So there is a preparation every day at the meeting. This happens with the aim of being able to develop their own lesson plans according to the needs of elementary school students. The components of the lesson plans prepared by the teachers include the following: 1. Preliminary activities include identity schools, themes, sub themes, KI KD, indicators, classes, time allocation and subject matter. 2. Core activities. 3. Closing activities. So basically, when compiling the lesson plans, you must pay attention to the following principles: 1. Contains an activity plan that students can follow. 2. Interesting like a student. This is prepared by the teacher so that students can choose from a list of activities. 3. Variations in activities must be done to minimize learning boredom. 4. The teacher provides at least three student activities to maintain children's interest in learning with diverse learning experiences. 5. Can reflect the STEAM approach to thematic learning.

Based on the results of interviews with educators, it can be concluded that each topic discussed must be related to components including science, technology, engineering, art and mathematics. In STEAM learning, the five components are sought to be discussed according to the topic to be studied. However, if this is not possible, then you can use a minimum of three components, whether science, technology and engineering or science, technology and math. This is done on the grounds that learning is maximized in achieving basic competencies in the subject matter. STEAM learning is aligned with the 2013 curriculum, which is based on attitudes, skills and knowledge.

2. Implementation of STEAM approach learning

STEAM learning is a learning process that uses the STEAM approach. STEAM stands for Science, Technology, Engineering, Arts, and Mathematics. The definition of STEAM is an approach to learning that uses Science, Technology, Engineering Science, and Mathematics as an entry point to guide student research, discussion and collaboration, and critical thinking. Through STEAM-based learning can guide research. This means that students working on a project will result in a research activity from what students are doing. Because in STEAM learning will produce a project, students will learn how to work together with their friends, and how they make decisions and solve problems. All these

activities will also create critical thinking activities, because in making a decision in taking an action critical thinking is needed, namely reasoning with analyzing activities and so on. Through STEAM-based learning, it will raise the question of how and why on any information or phenomena that occur around them.

Based on the explanation above, the STEAM approach is an approach that integrates the sciences of Science, Technology, Engineering, Arts, and Mathematics, so we know that STEAM-based learning can take place or a learning can be said to use the STEAM approach if it uses the five sciences that are integrated into STEAM. Therefore, these five sciences are the characteristics of the STEAM approach, namely:

a. Science

The application of science in schools is learning in which the application of knowledge is related to everyday life such as the environment, natural phenomena, and oneself. Through science students can develop basic science process skills, namely in observing, measuring, and explaining the results of observations.

b. Technology

Technology science learning refers to the use of equipment and developing gross motor skills. Through this knowledge, students can find out how students use a tool, electronic or non-electronic device. The use of electronic tools such as the use of scissors, pipettes, rulers, hole punchers, and so on.

c. Engineering

Engineering in learning is the ability to design, assemble or operate something to solve a problem.

d. Arts

The ability of art in this learning is to recognize and show works and activities related to art such as crocheting, tasting, folding, drawing and so on.

e. Mathematics

The application of mathematics here is like measuring, recognizing patterns, and so on. The true STEAM learning experience involves at least two or more fields from Science, Technology, Engineering, Art, and Mathematics. That way we can know that in its implementation it does not have to use the five sciences. STEAM learning can be done through several stages, namely:

1) Exploration

Provide opportunities for students to explore tools and play materials with various senses, thus encouraging students to ask questions. To support children's exploration, the teacher as a facilitator conducts invitations.

2) Extend

The teacher invites students to conduct investigations and challenges. Challenges that are open for students to solve problems with existing materials. Students can be challenged individually and also in groups. The knowledge that is integrated in STEAM can be used to answer students' questions about the environment or the world around them.

3) Engage

The teacher invites students to be involved in the learning experience, linking charity interests with the basic competencies to be achieved, so that the children appear to be concentrated, diligent, energetic and creative in playing activities.

4) evaluate

At the end of this learning activity the teacher evaluates learning activities, evaluations are carried out for students and teachers. Through STEAM-based learning, students are expected to be able to think more broadly, have freedom and be safe in expressing ideas, feel comfortable doing learning activities while doing, determine their own learning, be able to work together or collaboratively.

Therefore, STEAM learning is under the scientific learning process, integrative, differentiated and cooperative. This means that the use of STEAM learning must be combined with a cooperative approach so that students develop collaboration and communication skills during the learning process. STEAM learning is effective and can achieve the expected learning objectives by paying attention to the learning principles applied by STEAM learning, including: first, the principles of attention and motivation, for example, educators show contextual problems and arouse students' interest in solving these problems.

Second, the principle of activity, for example, students are directed to realize that in solving problems that in solving problems in the STEAM field, there are many ways of cognitive strategies such as linking problems with knowledge that they already have, making comparisons and assumptions (associations), inductive and deductive. Third, the principle of direct involvement, for example, students are given the opportunity to test the design in the form of egg packaging if it is dropped from a certain height.

Fourth, the principle of repetition, for example, students are given exercises in the form of worksheets, questions and opportunities to repeat STEAM learning with various learning sources. Fifth, the principle of challenge, for example, students are given several examples and non-examples to find concepts from the STEAM field being studied. Sixth,

the principle feedback and feedback, for example, students who have successfully carried out the steps of testing anti-breakable egg packaging can be given medals and given new challenges as a positive response. Satisfaction with work results makes students become more active/enthusiastic to learn. The seven principles of individual differences, for example each participant Students must be helped to understand their strengths and weaknesses so that they receive treatment and services according to the abilities and needs of students.

3. STEAM approach learning assessment

Learning assessments are collected from children's work, notes from teacher observations. STEAM stimulates children's curiosity and motivation regarding higher order thinking skills which include problem solving, collaboration, independent learning, project-based learning, challenge-based learning and research. learning activities that are suitable for the STEAM approach are project-based learning activities (Project Based Learning). The use of project based learning is based on the assumption that problem solving will not be complete if it is not viewed from various aspects (Mentari, 2018: 43)

Based on the results of observations with educators, it can be explained that the learning objectives must be used as a reference for thematic learning based on the steam approach. This means that the assessment must be completely accurate with the consideration of the specified skills. The assessment is composed of items or tasks of skills that are measured directly by describing learning skills. So the instrument plays a very important role, one of which is a non-test instrument that can be used to find out the products produced by students when implementing STEAM-based thematic learning. At the end, to measure the skills of educators, it is better to pay attention to several components of attitude, namely cognitive regarding students' knowledge of objects. Effects are related to students' feelings towards objects.

Instrument development is really needed if the teacher will see the results of the learning process. Changes in the instrument are a basic need to get optimal results from the application of STEAM learning. The changes that are carried out by the teacher today are in the form of changing the neatness instrument to being careful in attitude assessment, the knowledge section through a simple method with a written test, and the score from the test. only made two ranges of answers "Yes or "No". There was an assessment that was not optimal. So the accuracy in assessing STEAM learning must be categorized into three aspects, namely knowledge, attitudes, and skills.

a. Knowledge

1. Writing test

This is commonly used with multiple choice, fill-in, true-false, matching and description questions.

2. Oral test

How to assess by giving direct questions to students will respond directly in the form of sentences or paragraphs with courage and confidence.

b. Attitude

1. Self-assessment

An interesting assessment by asking students to find their own strengths and weaknesses in achieving competence in the form of a self-assessment sheet instrument.

2. Friends Rating

Almost the same as self-assessment, only the way is asking students to assess each other between students related to their attitudes and daily behavior with the student assessment sheet instrument.

c. Skills

1. Project

Assessment of tasks that contain investigations and must be completed in a certain period. Includes planning, implementation to reporting.

2. Portfolio

This assessment is carried out through a collection of students' works that are systematically and organized and carried out within a certain period of time. So the development and skills of students are monitored continuously.

D. CONCLUSION

The end result that is expected from the application of the team learning approach is that students can take risks seriously to engage in experiential learning, persist in problem solving, embrace collaboration and work through the creative process. central center of the learning process both inside and outside the classroom. STEAM learning is a series of planned activities carried out by students to achieve certain goals under the guidance, direction and motivation of educators.The researcher's suggestion when implementing STEAM-based learning is to provide information that becomes the identity of the learning. So that it is easy to understand like educators or other people if you want to apply it again by becoming a reference for STEAM learning in elementary schools.

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