




Analyzing STEAM Project-Based Learning in PAUD Terpadu 'Aisyiyah Nur'aini Unit II Yogyakarta

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Abstract

Project-based learning enables teacher to guide the learning process and development of various developmental aspects of students. One of them is through the STEAM project with three stages: preparation, development, and conclusion. STEAM is a collaborative learning that facilitates motivation and innovation allowing for students' creativity. Hence, students can strengthen not only their cognitive aspect. Integrated Early Childhood Education (PAUD Terpadu) 'Aisyiyah Nur'aini Unit Two Yogyakarta is a pilot school that implements STEAM project-based learning. However, no research has discussed the implementation. Therefore, the present study aims to know, analyze, and describe STEAM project-based learning.

The research subjects, or the informants, were four classroom teachers for children aged five to six. The classes implement STEAM project-based learning. The research belongs to a case study with the data collected through interviews, observation, and documentation. The data were analyzed using Miles and Huberman techniques with three stages: data collection, data reduction, and conclusion drawing. The results showed several characteristics of STEAM project-based learning in PAUD Terpadu 'Aisyiyah Nur'aini Unit Two. It emphasizes the students and provides them with critical and creative thinking and problem-solving through the teachers' roles.

Keywords: Project-Based Learning, STEAM Content, PAUD

INTRODUCTION

The 4C skills of the 21st-century include the ability to think critically and solve problems, collaboration, communication and creativity-innovation which underlie high-level thinking abilities (Nugroho, 2021). Of the four 21st-century skills, the two main skills that can be developed early are creativity and critical thinking skills. The development of children's creativity will continue to increase until the child enters their next age. Every child has the potential to be creative with different levels of creativity (Anhusadar, 2016; Rohman, 2017; Sari, 2005).

Project-based learning encourages children to their ideas and opinions more actively. Children's ideas or ideas that are poured into a work product will provide authentic results and

can be measured by the teacher in their learning. Therefore, project-based learning places the teacher as a facilitator, the role of the teacher is to provide services to facilitate students in the learning process (Sanjaya, 2013). The use of project-based learning rests on the assumption that a solution to a problem will not be complete if it is not reviewed from various angles (Al, 2018).

Project-based learning is a thinking activity that can improve higher-order thinking skills. The project-based learning model has advantages in improving students' learning habits and motivating children to think rationally in solving a problem in real life. The implementation of project-based learning can be a solution to learning methods that can increase imagination, critical thinking and creativity in exploring children's ideas and interests, so that learning activities are based Projects can provide a good meaning of learning for children (Norhikmah et al., 2022).

Project based learning is a learning that is applied by the teacher by presenting a learning material that allows children to process it themselves to master the learning material (Sulisworo, 2019). So it can be said that project-based learning has collaboration between teachers and students so that learning is not teacher-centered. Project-based learning is a learning model that provides opportunities for teachers to manage classroom learning by involving project work (Mukhlis, 2010). The project-based learning model is a way of teaching by providing opportunities for children to solve problems in their lives (Amelia & Nuraeni, 2021). Project-based learning makes children able to ask questions about projects being carried out, children are more enthusiastic and interested in learning projects (Prima & Lestari, 2021). Based on the various explanations above, it can be concluded that project-based learning is learning that involves the teacher in managing learning, so that children can solve problems by having interest and enthusiasm during the project learning process.

STEAM (science, technology, engineering, art, and mathematics) is learning content that uses elements of science (knowledge, technology, engineering, art, and mathematics) as well as a breakthrough in addressing the real world (Nurdiana et al., 2020). STEAM content is about science, technology, engineering, art and mathematics where these five contents are related to everyday life and are familiar with current conditions (Al Afada, 2022). STEAM is a strategy for

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giving birth to children who have creative and critical abilities in depth (Azizah, 2020). Based on the various explanations above, it can be concluded that STEAM content has five elements of knowledge namely science, technology, engineering, art and mathematics which can develop creative and critical abilities in a child.

STEAM content for early childhood, the first understanding of scientific content is not science that conducts experiments using fire, chemicals or so on, but science in PAUD learns about life cycles, living things, bodies, food, water, air. Furthermore, the third is engineering or technical content, this content teaches children to try and find out that failure is not bad and they must be willing to try. Then the fourth content is art, this content is applied when the teacher frees children to be creative through art. Finally, mathematical content, such as sorting numbers, knowing shapes, making patterns, comparing a lot, and gathering information (Wahyuningrum et al., 2021).

Previous research conducted by Al Afada (2022) emphasized the application of the use of loose part media, and developing learning using loose parts in more diverse play activities at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two, from this research it was found that learning project-based at Integrated PAUD 'Aisyiyah Nur'aini Unit Two. Based on the description above, researchers are interested in seeing how project-based learning contains STEAM in Integrated PAUD 'Aisyiyah Nur'aini Unit Two.

METHOD

The type of research used in this study is qualitative research. Qualitative research is a research method used to examine the conditions of natural objects or natural settings (Sugiyono, 2015). This type of research is a case study approach that aims to find out, analyze, and observe the events of the process of exploring in depth the teacher's work program in STEAM-laden project-based learning at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two Yogyakarta. The reason researcher chose this type of case study research is because the researchers want to know, describe and analyze the conditions observed in the field in a more specific, transparent and in-depth manner assisted by words based on relevant data collection

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and data analysis techniques. According to Creswell, in Sugiyono (2015) a case study is a type of qualitative research in which the author conducts an in-depth exploration of programs, process events, and activities towards individuals related by time and activity.

This research conducted for 8 months from October to June at the 'Aisyiyah Nur'aini Integrated PAUD after instrument validation is completed. It involved four class teachers as informants in this study with the criteria of having used STEAM-loaded project-based learning in the 5-6 years old group.

The object of this research is project-based learning which consists of three stages: the initial stage, the development stage, and the conclusion stage, in project-based learning with STEAM content at the Integrated PAUD 'Aisyiyah Nur'aini unit two Yogyakarta. Techniques and data collection instruments in the form of interviews, observation, and documentation. In the form of interviews questions regarding the 3 stages (initial stage, development stage, and conclusion stage) of implementing project-based learning, how teachers carry out project-based learning with STEAM content at Integrated PAUD 'Aisyiyah Nur'aini Unit Two Yogyakarta. What was observed during observation is a subject aspect which contains three stages: the initial stage, the development stage, and the conclusion stage. Then the indicators and notes from observations at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two Yogyakarta. Documentation grid is in the form of initial stage documentation: documentation of children who are actively involved during the implementation of learning; documentation when the teacher organizes learning media; learning media documentation, documentation at the development stage: documentation of play activities; documentation of children's involvement when carrying out play activities, and documentation at the conclusion stage: documentation of the assessment format; documentation of discussion activities at Integrated PAUD 'Aisyiyah Nur'aini Unit Two Yogyakarta.

RESULTS AND DISCUSSION

The discussion in STEAM-laden project-based learning in learning for ages 5-6 years at Integrated PAUD 'Aisyiyah Nur'aini Unit Two. There are three sub-aspects contained in this

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study, namely the initial stage, the development stage, and the concluding stage. Project-based learning with STEAM content at Integrated PAUD 'Aisyiyah Nur'aini Unit Two is carried out for four days or one week of project implementation according to main activities. TKIT Al-Farabi that the project was carried out for four weeks with each week producing several projects which were carried out based on the initial stages, development stages, and conclusion stages (Amelia & Nuraeni, 2021). The implementation of project-based learning in its implementation can be carried out with a longer or unlimited time (Siregar, 2021).

Project-based learning is a thinking activity that can improve higher-order thinking skills in completing the activity material provided by the teacher. Project-based learning (project-based learning) is learning that is applied by the teacher by presenting an activity material that allows children to work to master the activity material (Sulisworo, 2019). Project-based learning is a learning model that provides opportunities for teachers to encourage classroom learning through project work (Mukhlis, 2010). The project-based learning model is a teaching method that provides opportunities for children to solve problems in their lives (Amelia & Nuraeni, 2021).

The results of observations at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two in class B4 that project-based learning is carried out by giving freedom to children to think critically, each child is asked to express his opinion without having to be interrupted when the child is talking, is literate before starting learning, the child is able completing projects with various designs, children exchanging opinions with group mates, children presenting project results in front of the teacher and friends, so that children get used to talking, critical thinking, asking questions, collaborating and children are interested in project learning given by the teacher. Project-based learning provides opportunities for children to ask questions about the projects being implemented, children are more enthusiastic and interested in learning projects (Prima & Lestari, 2021). In addition, it is also supported by a research stating that the application of project learning can be one of the solutions to learning methods that can increase critical thinking imagination and creativity in exploring children's ideas and interests, so that Project-based learning can teach children the importance of good learning (Norhikmah et al., 2022).

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This proves that project-based learning invites children to think critically and get used to new experiences.

In addition to critical thinking skills, project-based learning is to hone creativity skills. Every child born has the potential to be creative with different levels of creativity (Anhusadar, 2016; Rohman, 2017; Sari, 2005). As in the Integrated PAUD 'Aisyiyah Nur'aini Unit Two, each child is given the opportunity to design projects with creativity according to their ideas and ideas. Creativity is an activity to provide real experiences to children by giving children freedom to complete a given project with various designs of work.

The results of the research are the interviews, observations, and documentation at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two. In this part of the discussion, the author describes project-based learning with creativity skills, that children are involved in thinking creatively when forming concepts at the beginning of learning in making projects with playing loose parts activities. Loose parts playing activities are inseparable from project learning, all children design loose parts in various forms that have their own characteristics according to the theme of the provocative sentence chosen at the beginning. Project learning with loose part materials that use teaching materials that come from used materials or materials that are around children that are easy to move, and manipulate and how to use them is determined by the child (Imamah & Muqowim, 2020). This is supported by the results of research at the Al Anwar Kebumen KB that the use of loose parts media is one of the most effective media for encouraging children's creativity, because the materials vary, giving rise to its appeal for children (Mardiyah & Hambali, 2022). This proves that project-based learning with loose parts media is a solution for teachers to encourage children's creativity. Project-based learning with STEAM content is integrated into five elements of knowledge that can be applied to learning.

STEAM is learning content that uses elements of science, technology, engineering, art, and mathematics as new things in dealing with the real world (Nurdiana et al., 2020). STEAM is a collaborative learning content that leads to providing motivation and innovation that can produce creative children towards society, which not only increases learning discipline. But between disciplines, through the relationship between science, technology, engineering, art and mathematics, by utilizing existing facilities in the surrounding environment (Gunawan, 2019).

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As is the case in the Integrated PAUD 'Aisyiyah Nur'aini Unit Two teachers have books as literacy in which there is STEAM content, children design projects by thinking STEAM content like an architect, children solve problems by thinking STEAM content.

The results of observations at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two in class B4 that the STEAM content found during the study was when children were invited to literate with the teacher discussing technology using mobile phones, identifying the weight of frogs, different colors of frog shapes and frog. STEAM content was found when the child made a presentation about project, and discussed the large amount of water reservoirs that could be used for a long time, the child thought that a bathtub was enough to hold water, but the teacher gave various trigger questions, then an idea emerged that wells can hold water. The next day the teacher asked about the correct well design, safety, and how to use it, finally the children explained the pulley system and push and pull levers using ropes, and water buckets, children were invited to think about the weight of the volume of water. STEAM content can develop because it is connected to the environment, resulting in learning that presents the real world experienced by children in everyday life (Subramaniam et al., 2012). STEAM is learning that encourages children to be creative, think logically and think symbolically in problem solving (Maharani, 2020).

Another example besides Adi's house project is a project to make a fish pond, children present their project work to the teacher, but there is one unique thing that makes children think and seek solutions to problems, namely when making a fish pond next to a crocodile pond. The teacher triggers children with open questions, and then invites children to discuss. The teacher invites children to think about STEAM content and solve a problem by asking open questions, so that children get used to thinking broadly. This is in line with a research explaining that STEAM-based learning can develop children's creativity and apply active and creative learning models, where children play an active role in digging up information about new things in children through their surroundings (Widowati et al., 2020). When defining learning materials, the teacher must have sufficient knowledge to identify the STEAM contents that arise from one or more learning activities, namely by analyzing the questions that will be asked

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to children in learning and looking for answers from various literature (Metafisika, 2020). It can be concluded that project-based learning with STEAM content has one unit in the implementation of learning.

Based on the discussion, it can be concluded that project-based learning with STEAM content is carried out in unlimited time according to literacy, making it easier for teachers to provide direct learning and experience to children who hone critical thinking skills and creative abilities, and encourage children to seek solutions to problems through STEAM content. . The things that make project activities interesting are when project-based learning with STEAM content is combined with loose parts of media as a main activity.

The teacher conducts an assessment by listening to children's presentations, observing children's activities, documenting and recording children's processes, and reflecting. Teaching modules have been provided by the school curriculum team so that the class teacher carries out the contents of the teaching modules.

CONCLUSION

Based on the discussion that was carried out in the previous chapter, it can be concluded that project-based learning with STEAM content in the Integrated PAUD 'Aisyiyah Nur'aini Unit Two can be carried out for a long time or indefinitely. In carrying out the learning, the STEAM-laden project-based learning phase has challenges for teachers when children experience confusion in choosing play activities, facing children to provide an understanding of the project being carried out. project-based learning with STEAM teachers provides literacy understanding, trigger questions that are packaged in a very interesting way to make children have critical thinking skills so that children get used to a variety of new experiences, project-based learning with loose part media helps teachers to support learning that stimulates children's creativity, stimulates the ability to find solutions to problems by thinking about STEAM content. Thus, the implementation of STEAM-laden project-based learning at the Integrated PAUD 'Aisyiyah Nur'aini Unit Two shows a portrait of child-centered learning, providing opportunities for children to think critically, creatively, and selectively through the optimal role of the teacher during the process.

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