



Project-Based STEAM Model Learning to Improve Creative Thinking in Early Childhood

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ABSTRACT

The independent curriculum applied to early childhood today puts pressure on the development of creativity and gives freedom in learning. Finding a project-based STEAM approach that can improve early childhood creative thinking is the goal of this study. This research was conducted to apply varied learning to develop children's creative thinking with the appropriate learning model and in accordance with the current school needs. The research techniques applied in PTK, or class action research. Methods of gathering data that combine documentation as well as observation. Diagrams are then used to apply the observations' findings to see the progress of each cycle. From the exposure of each cycle can be seen at the time of pre-cycle there are still students who get low scores, then develop in the cycle one pupils who get very good scores and continue to increase in the second cycle where most pupils get excellent scores. The findings in this study to know how project-based STEAM learning can enhance creative thinking in early childhood are shown when learning begins to vary and students can create their own results without the help of others and can produce different forms or works according to the creative ideas of each student. According to the study's findings, fifteen pupils obtained great scores., 3 students received grades that matched expectations. With a project-based STEAM model, we can prepare future generations for the increasingly complex challenges of the world by expanding STEAM models for early childhood.

INTRODUCTION

The curriculum plays an important role in the learning process because it provides guidelines for formulating educational goals and makes the learning process easier. The curriculum will be easy to implement through several approaches, one of which is STEAM-based (Science, Technology, Engineering, Arts and Mathematics) (Zelly Iffiani, et al., 2024). With the independent curriculum that is currently being implemented, the STEAM learning model is very suitable to be applied to young children, because the independent curriculum gives children freedom and breadth in choosing various activities and being free to create.

By considering a number of problems related to early childhood education. The learning activities carried out are still less varied and interesting (Novita Ananda et al., 2023). The activities carried out are still too passive so that the process of stimulating children's creativity does not emerge. The development of creativity as seen through the characteristics of children's behavior has not developed well (Azizah et al., 2023). Learning activities still use loose parts media which are still limited and less varied, so a variety of learning media is needed so that

children's creativity can increase (Qotrun Nada et al., 2023). Based on field findings, researchers found several problems, namely that the learning activities carried out still implemented a monotonous learning model. and students are less creative when studying or choosing media in creating work or a project.

According to observations from researchers in the field, the cause of the existing problems is due to the lack of application of varied learning models. so that children's activities are monotonous and children cannot fully develop their creativity, because there is no learning that can stimulate children's creativity to create fun activities according to the child's imagination. The cause It is often found that children cannot express their creative thinking abilities in carrying out daily activities, this is because children's learning activities are only focused on cutting, drawing and coloring activities so that children cannot explore materials and media for play activities (Dian Pratiwi, et al., 2024). It is important to realize that learning orientation in early childhood does not solely focus on academic skills such as reading, writing and arithmetic (Karlina et al., 2023).

Based on the problems and causes that have been encountered, it is very important to use learning models that are fun for children, so that they can improve skills for young children, one of which is improving children's Creative Thinking skills. Therefore, researchers apply the STEAM model to improve children's creative thinking and create fun learning. The researcher hopes that the application of this project-based STEAM learning model will have an impact and change on teachers and students by inviting children to participate in learning activities that give children freedom when learning and stimulate children's creative thinking to be free to create. Develop student competencies in STEAM education for preschool children, especially in terms of knowledge and skills in organizing Steam educational activities for children (Chuong et al., 2023). It is important to develop children's creativity through age-appropriate and fun learning, namely through learning while playing activities using loose part-based STEAM which can increase children's creativity (Maarang et al., 2023). By using a learning approach that can encourage children to explore, solve problems, and create projects, creativity can be developed. One learning approach that has a lot of potential is STEAM (Salma et al., 2023). It is necessary to promote the professional development of teachers in STEAM through training programs that increase knowledge of the approach and provide the tools necessary to apply it in the classroom (Silva-Hormazábal & Alsina, 2023).

A learning model that is able to develop children's thinking abilities through STEAM learning. STEAM is a learning model in the world of education consisting of Science, Technology, Engineering, Arts and Mathematics, including an educational approach process, whose approach leads to problem-solving abilities in the activities carried out (Farida et al., 2023). STEAM steps 1) Identification, 2) Selection of a theme or project 3) Designing activities according to the theme or project (Hadianti, 2024). Examples of project-based applications of STEAM in learning activities include making innovative products from used goods such as toys or wall decorations (Zulkarnaen et al., 2023).

The STEAM learning model is a good learning model to apply to young children, but the application of the STEAM learning model also has advantages and disadvantages. The advantages of the STEAM approach in schools, apart from showing children the ability to recognize and understand various information, children are also able to be curious, children see

cause-and-effect relationships and children can solve problems (Khodijah, 2023). There is no STEAM approach implemented in children's schools because they prefer direct learning processes, which makes learning about aspects of language development such as writing uninteresting. STEAM learning has several advantages in its implementation, including: 1) increasing students' knowledge in the field of science. 2) teach students to think actively, creatively and innovatively in solving problems. 3) allows students to apply their ideas in the latest technology (Syarif et al., 2023). Meanwhile, the weakness of using STEAM learning is that it requires adequate facilities and infrastructure, children tend to be less interested in other subjects (Arifah & Wulandari, 2023).

Researchers use project-based STEAM to improve creative thinking with reason improving creative thinking skills is essential because it helps them learn to solve problems, innovate, and adapt, which are critical skills for success in an ever-changing world. Children's creativity can increase in research (Lestari & Handayani, 2024) entitled STEAM Learning on the Creativity of Early Childhood Age 5-6 Years. The project-based learning model is a learning model where teachers provide opportunities for children to be actively involved in solving problems encountered in everyday life carried out in groups. (Nurul Islamiyah, et al., 2024). The steps for project-based implementation that can be applied to early childhood are the preliminary and closing activity steps, which are similar to other learning models, the special differences lie in the core activity steps, such as presenting material, dividing into groups, determining projects, scheduling, project creation, and project testing (Matondang et al., 2024). The project-based learning model can increase children's creativity, in this case it is proven in research conducted by (Elvariani et al., 2024) Regarding the Influence of Playing Projects Using Natural Media on Children's Creativity at Wahyu Kindergarten.

Creative thinking is a child's ability to think to solve problems and have the ability to create something new (Novitasari & Dirgayunita, 2024). According to Acip. et. al. (2024) Creative reactions, longer attention spans, self-organization and self-confidence, linking ideas and storytelling skills, developing imagination, and adding new vocabulary are all indicators of improved creative thinking (Lestari Tindana et al., 2024). The STEAM relationship to improve creative thinking is that want to be able to give their opinions in the ongoing learning process, the positive impact is that they can explore themselves from the activities they do (Permata et al., 2023).

METHODS

This research was carried out on 18 students at the Roudhatul Ulum Jember Kindergarten, which is located on Jalan Nangka Raya 1A Perumnas Patrang. The duration of the research was three weeks. This classroom action study was carried out over two cycles. According to this research, students in Class A Kindergarten Roudhatul Ulum, Jember City less creative when studying or choosing media in creating work or a project. As a result, efforts must be made to improve students' creative thinking by using appropriate learning models. As proposed by researchers, namely trying to apply the STEAM model to improve students' creative thinking. Data collection methods require observation and documentation. This classroom action study was designed in two cycles according to Arikunto, et. Al (2015) where

this research design uses four stages research: 1) Planning, 2) Implementation, 3) Observation, and 4) Reflection.

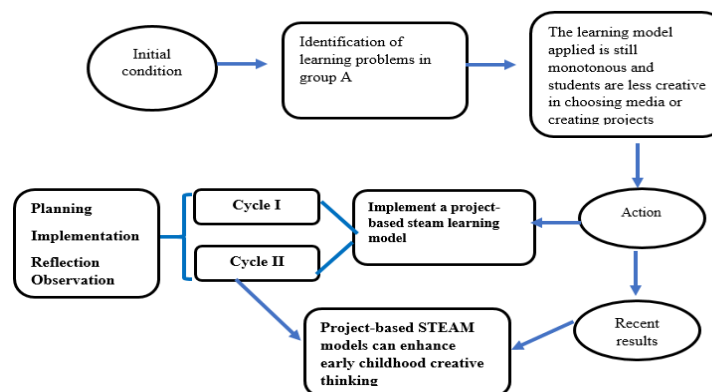


Figure 1. Research stage procedure chart

In this research, descriptive methods were used to analyze the data. Next, the data is described, written, and displayed in percentage form. The school uses the class action grades Not yet developing (BB), Starting to develop (MB), Developing according to expectations (BSH), and developing very well (BSB). This research is considered successful if 80% or 15 of 18 students achieve the BSH score.

RESULTS

Based on the results achieved in the pre-cycle, it can be seen that children's creative thinking abilities have not developed well. The researcher's goal is to improve the creative thinking of children in group A through project-based STEAM learning.

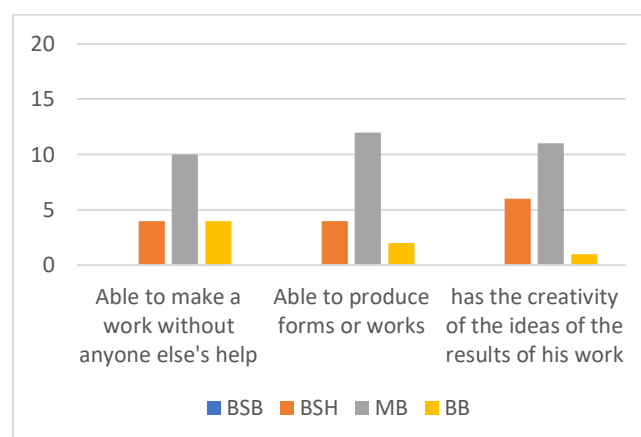


Figure 2. Pre - Cycle Recapitulation of project-based STEAM model learning to improve Creative Thinking

The initial results of children's creative thinking abilities are based on researchers' findings on group A students. The data collected included 10 students who were able to make assignments without the help of others, with a BB score, 4 students received MB scores, and 4

students received BSH scores. There are no students who meet the excellent criteria. This problem is caused because children tend to imitate what the teacher exemplifies, and teachers do not really understand STEAM-based learning.

This problem is the reason why researchers conducted action research to improve children's creative thinking through project-based STEAM learning. Therefore, researchers and teachers created a STEAM-based learning plan using STEAM steps, namely 1) Identification, 2) Selection of a theme or project 3) Designing activities according to the theme or project.

The implementation of the action was carried out by researchers and teachers, first identifying students in group A, then determining a theme according to what was in the RPPH regarding the theme Plants around me, where the teacher and researchers had prepared an activity or project, namely about 3M activities. Cutting, matching and pasting activities to correctly arrange trees, leaves and bananas according to the numbers found on the children's worksheet.

In the results of Cycle 1, there is data on children on the indicator of being able to create work without the help of other people, 7 children with a BSH score, 8 students with a BSB score and 3 students with an MB score, and there are no students with a BB score. However, the indicator was able to produce a form that there were 8 children with a BSB score and 10 children with a BSH score. There were no students who received a BB or MB score on this indicator. Meanwhile, on the indicator of having creative ideas from their work, there were 7 children who had BSB grades, 8 children had BSH grades, 3 students got MB grades, but no students got BB grades. This increase in children's creative thinking abilities is because children are free to carry out activities or create works according to their imagination and teachers are not monotonous in providing explanations or concrete examples. However, the data findings are still not in accordance with the level of success determined by researchers.

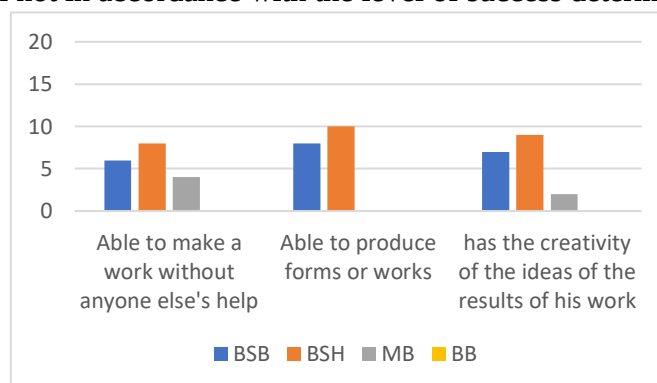


Figure 3. Recapitulation of Cycle 1 Project-based STEAM model learning to improve Creative Thinking

Obtaining this data cannot be said to be successful. Because their grades had not yet reached the qualifications, these 18 children were able to improve their creative thinking through project-based STEAM learning. Therefore, in Cycle II researchers need to perfect their research again.

The following is data on the results of activities obtained during research cycle II. In this cycle there are changes to increase children's creative thinking through project-based STEAM. The data is displayed in the following diagram:

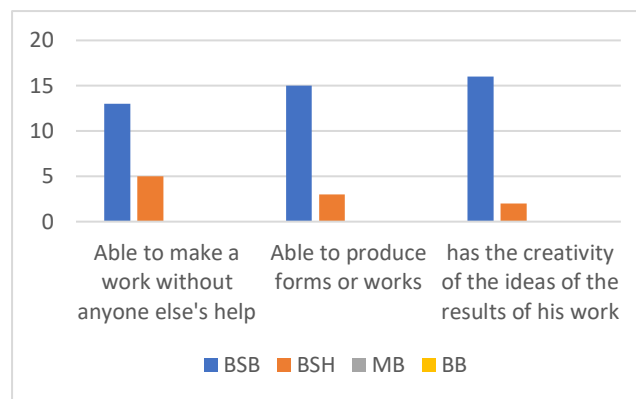


Figure 4. Recapitulation of Cycle II Project-based STEAM model learning to improve Creative Thinking.

Based on this diagram, it can be concluded that there is an increase in project-based children's creative thinking compared to the previous cycle. Because in cycle II, the researchers changed student activities to activities that were more interesting for children, namely making stamps from leaves and food coloring in groups. owned by thirteen children and 5 children have BSH values. In this cycle, it is enough to meet the criteria desired by the researcher, so the research is sufficient. In the indicator of being able to produce forms or works, there are 15 students with BSB scores and 3 students with BSH scores. In indicators of creative ideas from the resultshis work, there were 16 students with BSB grades and 2 students with BSH grades.

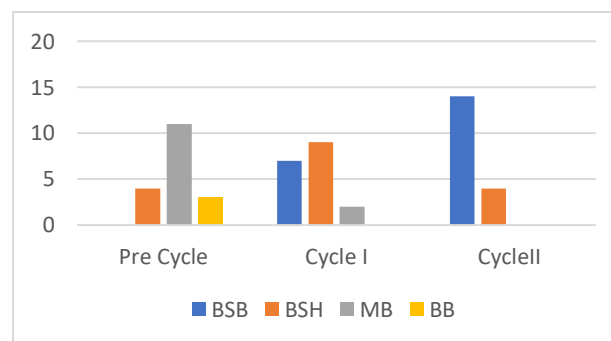


Figure 5. Recapitulation of pre-cycle analysis, cycle I, and cycle II Project-based STEAM model learning to improve Creative Thinking

From the diagram above, it can be concluded that although the pre-cycle stage shows improvement, there are no students who meet the BB score criteria and no students meet the BSB score criteria. However, there was an improvement during the first cycle, with 7 students getting BSB grades and no more getting MB grades; In the second cycle, the number of students who got BSB marks increased rapidly, reaching 15 students. Each cycle shows significant improvement.

The research results show that the project-based STEAM model can improve children's creative thinking. This is proven by children being able to create new works without the help of other people according to their imagination and being able to create varied shapes according to their creative ideas.

DISCUSSION

Learning created by researchers and teachers is better. The goal of this additional study is to determine a project-based STEAM model that can help young children be more creative. Cycle 1 and 2 action models were used in this research to collect comparative data on children's development during the research. There are three assessment criteria that must be met by children in the study: the ability to create their own work without the help of others; the ability to create shapes or works; and the creativity of ideas from the results of their work. The findings of the research results in the cycle were that there were 6 students who still had low scores, then the researchers continued in cycle I by changing to different activities, namely the project of cutting, sticking, arranging pictures of banana trees which had previously been invited to the children first. Observe the banana tree to find out the shape of the banana tree. However, in this cycle there were still two children who got low marks, the obstacles encountered by the children were that they were still confused about placing the leaves in the order and some of them still had the reverse way of attaching them. The researcher continued in cycle II with the same theme but different activities. The researcher chose the activity of making stamps from leaves and plants around the school. The researcher also provided various coloring materials. This activity is in accordance with students' interests so that children's grades and creative thinking increase. It can be concluded that there are 15 children who got very good grades.

Several previous researchers have carried out these indicators, namely by (Hasanah et al., 2021) The highest indicator for improvement is the indicator that children can create works and the indicators that children can create various materials for works that have aesthetic value. Project-based STEAM model learning can improve children's creative thinking, this is proven by students being able to create works without the help of other people according to their imagination and being able to create varied shapes according to their creative ideas. These results were also strengthened in research at RA Al-Manshuriyah Sukabumi City, by (Nur & Nugraha, 2023) which states that the STEAM Learning Model encourages students' mental flexibility by introducing an interdisciplinary approach. In this case, students' creativity is reflected in their ability to generate different ideas and offer solutions that combine knowledge from various scientific fields. According to (Hardiyanti & Rosnaeni, 2023) These project-based learning activities provide children with new experiences and give them the freedom to experiment. This can help improve their creativity. According to other research by (Kristiyani et al., 2024) Using the STEAM learning approach has a significant impact on children's creativity. Children show an increase in environmental exploration activities and enrich their experiences, increase curiosity, and open themselves to critical thinking.

STEAM-based project learning can have an influence on learning, especially in terms of improving students' creative thinking abilities. Students will become more enthusiastic when carrying out learning (Rahma, 2024). Findings from research results by (Jumarniati & A, 2023) STEAM learning makes children more active and able to take initiative with their own knowledge. Research results according to (Cahyaningsih & Harun, 2023) Explain that Project learning is able to increase children's creativity, because in the learning process children are directly (real) involved in carrying out various activities and experiments with materials to produce shapes or objects. Meanwhile research according to (Wuri Sasmita, 2023) The resulting creativity STEAM learning activity is that children can produce projects by producing works

that have never been made before in a short time, then children are able to describe the results of their work. In another study carried out by (Yansyah Nurinayah et al., 2021) Wulansuci, G. et. al. (2021) said that STEAM learning can increase the creativity of young children and with the STEAM approach the children's learning process looks more active and children are more focused on doing the tasks given by the teacher, and through the project method it can build children's critical thinking, stimulate children to be able to solve problems. simple. Project-based STEAM learning with the help of media available in the child's surroundings. The research results show that children's creativity levels increase. This is seen from the indicators of creativity that have been fulfilled, such as the ability to think smoothly, explore tools and materials, emerge new ideas, and the ability to detail (Ghoni et al., 2022).

CONCLUSION

Based on the action research above, it can be concluded that students' creative thinking can develop through appropriate learning models as carried out by researchers that the project-based STEAM model can improve creative thinking. This was proven by researchers when carrying out pre-cycle, cycle 1 and cycle II actions in the early stages of childhood. There were no children who received BSH grades, but there were children who received BB grades. After the first cycle, the number of children with BSH scores was higher than BB scores. Because there were no more children who received BB grades, the second cycle showed significant improvement, 15 students out of 18 students had achieved BSH grades and 3 students out of 18 students got BSB grades. With a project-based STEAM model, we can expand the STEAM model to include early childhood to prepare future generations for the challenges of an increasingly complex world.

DECLARATIONS

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