Think Creative with Islamic STEAM Project-Based Learning

Farhatin Masruroh
Fakultas Tarbiyah, Universitas Ibrahimy, Indonesia
farhatinmasruroh@gmail.com
Raudlatul Qamariyah
Fakultas Tarbiyah, Universitas Ibrahimy, Indonesia
rqamariyah@gmail.com
Ratna Pangastuti
Fakultas Tarbiyah dan Keguruan, Universitas Islam Negeri Sunan Ampel, Indonesia
ratnapangastuti33@gmail.com

ABSTRACT
I-STEAM project-based learning with loose parts media is a vital lesson to be applied in early childhood education to prepare a generation that can think creatively, master science and technology, be able to solve problems, and have a positive character so that they can compete in the global arena without lost a noble personality. This study uses classroom action research, observation of learning activities in the form of an action that is deliberately raised and occurs in the classroom, carried out in two cycles. The results of this study: 1) Increasing children's creative thinking skills through I-STEAM PJbL-based learning with loose parts media begins with the children being divided into groups with different activities. Children carry out I-STEAM PJbL activities with loose parts according to their interests. The teacher gives freedom to children to create different work; children are also free to ask questions and express opinions. 2) The results showed an increase in creative thinking skills in children. In the pre-cycle, the percentage of children was 45%, and after the action was taken in the first cycle, only 13 children out of a total of 20 children were declared capable of achieving the minimum completeness criteria, with a percentage of 65%. While in the second cycle, 17 children achieved the minimum completeness criteria, namely with a percentage of 85%. Based on the results of the second cycle, it was discontinued in the next cycle because it had reached the specified classical completeness target, which was 80%.

KEYWORDS
I-STEAM,
loose parts,
creative thinking

Introduction

Entering the millennial era 5.0, it is undeniable that the progress of world science and technology is overgrowing. However, it seems that Indonesia has always been at the bottom in terms of performance index compared to other countries. Based on The Program for International Student Assessment (PISA) results in 2018 in the reading ability category, Indonesia is ranked 74th out of 79 countries, while for the assessment of mathematics and science abilities, Indonesia is ranked 73rd and 71st out of 79 countries. PISA participants (Hewi & Shaleh, 2020). Based on these results implied concerns about Indonesia's very low competitiveness. An interesting analysis of the PISA results shows that many educational processes still do not encourage higher-order thinking skills. The educational process is still thick at the initial stage of thinking

(remembering, understanding, and applying), not yet encouraging children to achieve analytical, evaluative, and creative abilities.

A learning approach that is currently being developed is STEAM (Science, Technology, Engineering, Art, Mathematics). This learning is in harmony with the 2013 curriculum, namely the priority of developing students not only on cognitive aspects but also aspects of religious and moral values, language, social-emotional, artistic, and physical motor skills. So, there is a blend of attitudes, knowledge, and skills.

STEAM is very effective in early childhood education, considering that the golden age is the right time to develop various concepts of knowledge and experience through exploratory activities. Maria Montessori called early childhood a period of the absorbent mind, a period of sensitivity and easy absorption of all information (Montessori, 2008). This learning can stimulate children to think creatively, which is packed with fun learning. Creative thinking is a person's activity in answering a problem in various ways (Nuriana Rachmani & Masrukan, 2018). Meanwhile, according to Krulik & Rudnik, creative thinking is one of the highest levels of a person's thinking, which starts with memory (recall), essential thinking (basic thinking), critical thinking (critical thinking), and creative thinking (creative thinking) (Krulik & Rudnick, 1999).

The current phenomenon is that religion and general science are separate from each other; if it continues to grow, then what happens is there is a dichotomy of science so that a person will only be intellectually intelligent, he does not know God, and the role of general science becomes only for worldly purposes. The Qur'an and Hadith do not distinguish between Islamic religious knowledge and general sciences; what is in the Qur'an is science. Therefore, it is necessary to inculcate the principles of monotheism in teaching the general sciences so that religion and general science can go hand in hand. STEAM does not mean that it can only be applied separately without relation to Islamic values. On the contrary, religious values can be integrated in an integrated manner in every element of STEAM.

Merging Islamic learning with STEAM is learning by presenting the real world experienced by children in everyday life while still applying Islamic values as a Way Of Life. The STEAM concept integrated with Islamic values produces a new acronym, I-STEAM (Islamic, Science, Technology, Engineering, art, and mathematics). Thus, the combination of STEAM education with Islam will undoubtedly be a good learning strategy to create a generation of people who master science and technology, are creative in creating, able to solve problems, and have a positive character so that they can compete in the global arena without losing their noble personality. Islamic values that can be integrated include: 1) Hablun minallah; in the form of obedience, sincerity, gratitude, patience, tawakkal, mahabbah, 2) Hablun minan unlucky; such as help, empathy, compassion, cooperation, respect, 3) Hablun minan nafsi, such as honesty, discipline, independence, exemplary, istiqamah, optimistic and so on 4) Hablun minal 'alam (relationship with the natural surroundings); balance, sensitivity, care, sustainability, cleanliness, beauty, and so on (As, 2002; Kandiri et al., 2021).

The combination of Islamic and STEAM will certainly present a good learning strategy to create a generation that masters science and technology, thinks creatively and critically, can solve problems efficiently, and has a noble character so that they can compete in the global arena without losing noble religious values.

Learning based on Islamic, science, technology, engineering, art, and mathematics can be applied with appropriate learning media, one of which is loose part media. Loose part is a term put forward by architect Simon Nicholson based on the willingness to give children space to explore and express creativity using materials that can be changed, manipulated, and reinvented (Siantajani, 2020). Loose Parts are loose materials or

objects that can be moved, changed, and recombined using other means, and the child can determine the possibility of how to use them. If children can use it appropriately, if it is used properly, it will create creativity. Media loose parts consist of seven components, which children with different textures can touch. The seven components are natural materials, plastic materials, metal, wood and bamboo, yarn and cloth, glass and ceramics, and used packaging. One example of the integration of STEAM and Islamic values is to tell the contents of the Koran related to the occurrence of natural phenomena, celestial bodies, plants, and animals by inviting children to reflect, be grateful and explore with nature both elements of science, technology, mathematics, and his art.

Methodology

In this research, the researcher used the Classroom Action Research (CAR) method to apply the I-STEAM Project-Based Learning-based learning method with loose part media to improve early childhood creative thinking. Classroom action research can be interpreted as an effort to examine the learning activities of a group of students by providing an action that is deliberately raised. These actions are carried out by the teacher with students or by students under the teacher's guidance and direction to improve the quality of learning (Mulyasa, 2009). Kemmis and Mc Taggart stated that action research is a cycle consisting of four main components: planning or planning, acting or acting, observing or observing, and reflecting or reflecting. The four steps are a cycle or round, meaning that after the 4th step, then return to the 1st step and so on (Arikunto, 2006).

Results and Discussion

Implementation of I-STEAM PJbL-based learning with loose part media in cycle I and II start with the teacher giving directions to the children to sit in a circle. When sitting in a circle, the teacher explains the material while giving brainstorming opportunities, followed by explaining the activities to be carried out and the rules that must be obeyed during the implementation of activities, such as children should take turns and love friends during the activity. While delivering material about vegetable plants, the teacher also delivered verses from the Koran about plants and reminded the children not to forget to be grateful to Allah, who created plants.

The following verses of the Qur'an are conveyed to children:

$$\text{لِنُخْرِجَ بِهِ حَبًّا وَنَبَاتًا, وَجَنَّاتٍ أَلْفَافًا}$$

Meaning: We may grow grain, vegetation, and luxuriant gardens with it? (Surat an-Naba': 30/15-16)

Then the children were divided into four groups, each consisting of 5 children. Each group gets different activities. The teacher provides four activities that have been adapted to the theme of the day's activities. The theme used in the first cycle is the theme of plants, the sub-theme of vegetables, while the theme used in the second cycle is means of transportation, the sub-theme of sea transportation.

The activities carried out in the first cycle were gardening. In gardening activities, the teacher first demonstrates the correct way of planting, and then the children plant as the teacher has exemplified. The second activity is stringing words and colouring. In this activity, children assemble a word from the names of vegetables using loose parts in the form of an alphabet made of bottle caps and paper. Next, the children colour the sketch of spinach with crayons or drawing pencils.

The third activity is counting. Children compare and sort vegetables from the longest to the shortest in this activity. Then the child fills a small bowl with vegetables according to the number listed in the bowl. The fourth activity is role-playing. In this activity, children play the role of homemakers who cook in the kitchen. Children must make a dish according to their respective creativity. I-STEAM PJbL-based learning with loose part media in the first cycle, children's creative thinking skills overall score reached 127 and an average of 6.35 with a percentage of 65%.

After being seen from the assessment results in cycle one, it is said to have begun to develop compared to the pre-cycle value. However, the value obtained does not meet the KKM, so it is still not said to be successful. Therefore, it was continued with the implementation of cycle II.

Table 1. Results of Observation of Cycle I Percentage Improving Children's Creative Thinking Ability through Implementation of I-STEAM PJBL Activities with Loose Part Media.

Category Cycle	Number of Children	Percentage
Completed	13	65%
Incomplete	7	35%
Quantity	**20**	**100%**

The activities carried out in the second cycle are assembling words and making simple sea transportation tools. In the word stringing activity, the child assembles a word from the names of the means of transportation. Next, the children make simple means of transportation from loose materials that the teacher has provided. The teacher first gave an example of making a simple sea transportation tool. Then the children make sea transportation equipment, as exemplified by the teacher. The teacher also gives freedom to the children to make other means of sea transportation according to their imagination and creativity.

When delivering material on marine transportation equipment, the teacher also conveyed a prayer trip to the children as a form of inculcating Islamic values.

The following is a prayer for travelling that is conveyed to children:

بِسْمِ اللهِ مَجْرَاهَا وَمُرْسَاهَا إِنَّ رَبِّيْ لَغَفُوْرٌ رَّحِيْمٌ

During the activity, the teacher creates active communication with the child, such as asking the child about something he or she is doing; the teacher also gives the child the freedom to ask questions and convey ideas and opinions. In I-STEAM learning, all activities are more student-centred. The teacher only becomes a facilitator who helps children think further and can solve problems.

After the follow-up action in cycle II showed a perfect improvement, namely 85% with an average of 10.2, the development of creative thinking skills of several children had begun to increase, namely 17 children out of 20 children. Children begin to look enthusiastic and enthusiastic in participating in activities so that learning activities seem more active and fun. The recap of cycle II values can be seen in the following table:

Table 2. Results of Assessment of Achievement of Children's Creative Thinking Ability Indicators in cycle II

Category Cycle	Number of Children	Percentage
Completed	17	85%
Incomplete	3	15%
Quantity	**20**	**100%**

After carrying out the activities in both cycle I and cycle II, the children sat in a circle again to do the recalling. On this occasion, the teacher uses it to build knowledge and the ability of children to convey ideas about the learning experiences that have been obtained.

There are two perspectives regarding children's learning, namely the behaviourist and constructivist perspectives. The behaviourist perspective emphasizes that knowledge is given to children, and children enter that knowledge into their minds. On the other hand, the constructivist perspective leads to the construction of knowledge by children through an interactive and dynamic process (Imaduddin, 2017).

Science learning, one of STEAM's components, emphasizes the process of constructing knowledge by the children themselves. Thus, this knowledge will be more meaningful and become long-term memory for children. The I-STEAM PJbL activity with loose part media, which is applied to early childhood, aims to improve children's creative thinking skills. Besides being able to improve creative thinking skills, this activity can also stimulate other developments such as physical motoric, language, social emotional and others. This activity is also very beneficial for the growth and development experience.

Besides improving creative thinking skills, I-STEAM PJbL-based learning can also shape children's attitudes, which is one of the basic substances of science learning in early childhood, namely science as an attitude or scientific attitude. It means the various beliefs, opinions and values a scientist must defend, especially when seeking or developing new knowledge. Among these attitudes are a high sense of responsibility, curiosity, discipline, diligence, honesty, and openness to the opinions of others (Mursid, 2015).

Conclusion

I-STEAM-Based Learning Project-Based Learning is very effectively applied to early childhood. Through various activities and media, children can explore according to their interests. Children can also convey their ideas and ideas to increase their creative thinking. The results in the first cycle showed that only 13 out of 20 children were initially declared capable of achieving the minimum completeness criteria, with a percentage of 65%. In the second cycle, there was an increase of 17 children who had achieved the minimum completeness criteria, namely the percentage of 85%. Based on the results of the second cycle, it was discontinued in the next cycle because it had reached the specified classical completeness target, which was 80%.

References

Arikunto, S. (2006). *Prosedur Penelitian*. PT. Rinneka Cipta.
As, A. (2002). *Pengantar Studi Akhlak* (Edisi Revi). Raja Grafindo Persada.
Hewi, L., & Shaleh, M. (2020). Refleksi Hasil PISA (The Programme For International Student Assesment): Upaya Perbaikan Bertumpu Pada Pendidikan Anak Usia Dini). *Jurnal*

Golden Age, *4*(01), 30–41. https://doi.org/10.29408/jga.v4i01.2018

Imaduddin, M. (2017). Mendesain Ulang Pembelajaran Sains Anak Usia Dini yang Konstuktif Melalui Steam Project-Based. *1st Annual Conference for Muslim Scholars*, *2*(2), 950–958.

Kandiri, K., Arfandi, A., Zamili, M., & Masykuri, M. (2021). Building Students' Moral Through Uswatun Hasanah Principles: A Systematic Literature Review. *Nadwa: Jurnal Pendidikan Islam*, *15*(1), 109–128. https://doi.org/10.21580/nw.2021.15.2.8179

Krulik, S., & Rudnick, J. A. (1999). *The New Sourcebook for teaching reasoning and problem solving in elementary school*. MA : Allyn & Bacon.

Montessori, M. (2008). *The Absorbent Mind: Pikiran Yang Mudah Menyerap* (terj. Dary). Pustaka Pelajar.

Mulyasa, E. (2009). *Praktik Penelitian Tindakan Kelas*. Remaja Rosdakarya.

Mursid. (2015). *Pengembangan Pembelajaran PAUD*. PT Remaja Rosdakarya.

Nuriana Rachmani, D., & Masrukan. (2018). Peningkatan Kemampuan Berpikir Kreatif Mahasiswa Program Magister. *PRISMA, Prosiding Seminar Nasional Matematika*, *01*(02), 539–546.

Siantajani, Y. (2020). Loose Parts Material Lepasan Otentik Stimulasi PAUD. In *PT Sarang Seratus Aksara*. PT Sarang Seratus Aksara.