



Steam-Based Loose-Part Learning Media Can Build Independent Learning In Early Children



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Abstrak

Tujuan dari penelitian ini adalah untuk menganalisis bagaimana media pembelajaran dengan media berbahan dasar lepas sebagai upaya membangun kemandirian belajar anak usia dini. Metode penelitian ini adalah penelitian kualitatif deskriptif. Teknik pengumpulan data penelitian adalah dengan observasi dan wawancara. Penelitian dilakukan di TK Aisyiyah Bustanul Athfal 1 Wonorego dengan jumlah subjek penelitian sebanyak 16 orang yang terdiri dari 11 siswa perempuan dan 5 siswa laki-laki. Tahapan penelitian dimulai dari perencanaan pembelajaran hingga evaluasi dan tindak lanjut pembelajaran. Hasil penelitian menunjukkan bahwa pembelajaran dengan loose part dapat memberikan kebebasan bermain dan belajar sehingga dapat membangun kemandirian belajar anak usia dini. Hal ini terlihat dari meningkatnya kreativitas anak, mendorong anak untuk aktif dalam belajarnya, meningkatkan kemandirian anak, melatih kemampuan anak untuk bekerja sama, dan membangun rasa percaya diri pada anak. Strategi guru dalam memanfaatkan kelonggaran guru menyelenggarakan lingkungan bermain yang nyaman bagi anak. Bagian dari pembelajaran adalah anak bebas menentukan kegiatan bermain dan bahan yang diinginkannya.

Abstract

This study aimed to analyze how learning media with loose-based media functions as an effort to build early childhood learning independence. This research used descriptive qualitative method. Research data collection techniques used observation and interviews. The research was conducted at TK Aisyiyah Bustanul Athfal 1 Wonorego with a total of 16 research subjects consisting of 11 female students and 5 male students. The research stages started from lesson planning to evaluation and follow-up learning. The research showed that learning with loose parts could provide freedom to play and build learning independence for early childhood. This can be seen in the increase in children's creativity, encouraging children to be active in learning, increasing children's independence, training children's ability to work together, and building of self-confidence in children. The teacher's strategy in taking advantage of the teacher's leeway is to organize a comfortable playing environment for children. Part of learning is that children can determine the play activities and materials they want.



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INTRODUCTION

Early childhood education only develops creativity through drawing and coloring activities. Drawing and coloring play a role in developing a small part of early childhood creativity. Creativity is not just about color. Students or children are also expected to be able to develop and acquire life skills, which include both motor skills alone and affective and motivation to be skilled at dealing with various life problems (Suyono, 2017).

The independent curriculum is interpreted as a learning design that provides opportunities for students to study in a calm, relaxed, enjoyable, stress-free, and pressure-free way to show their natural talents. Independent learning focuses on freedom and creative thinking. The existence of an independent curriculum is a rearrangement in the national education system in Indonesia. Yamin & Syahrir (2020) stated that this statement is in the framework of welcoming change and progress of the nation so that it can adapt to changing times. In line with the opinion that "the concept of independent learning can then be accepted given the vision and mission of Indonesian Education in the future for the creation of quality human beings who can compete in various fields of life" (Sibagariang et al., 2021). The independent curriculum is expected for students to develop their potential and abilities because, with the independent curriculum, they get critical, quality, expressive, applicative, varied, and progressive learning.

One learning strategy that can utilize loose-parts material is STEAM learning. Loose parts are an essential element of STEAM-based learning. Several previous studies, such as (Rachmah et al., 2022); (Auliyalloh & Rakhman, 2020) in their research proved that using loose part media could increase children's creativity with high enthusiasm and children show various works. In addition, STEAM learning with loose part media can effectively

improve children's cognitive development (Oktarillyanza et al., 2021). In another study conducted by Putri et al., (2021), even during the Pandemic, Loose Part materials were used as a fun medium for studying at home because the materials were easy to obtain in the surrounding environment (Fransiska & Yenita, 2021).

Early childhood learning is carried out in a fun way by sticking to the idea that early childhood learning is learning while playing. Good learning must be supported by the media. The learning media used does not have to be expensive. The teacher, as a facilitator, must be able to use goods or materials around the environment to be used as learning media. One that can be used is loose-parts material. Loose parts are open items that are easy to find in everyday environments. Our nature contains loose parts, such as twigs, pinecones, shells, rocks, leaves, flowers, and other natural objects.

PAUD TK Aisyiyah Bustanul Athfal seeks to develop children's creativity by using various items in the environment around the children. With monitoring from DIKDASMEN, TK Aisyiyah Bustanul Athfal is more competent in utilizing loose-parts media, especially for increasing the development of creativity and building learning media in early childhood. In addition, PAUD TK Aisyiyah Bustanul Athfal 1 Wonosegoro is located in a rich village in loose-parts media, so the use of loose-parts media becomes more effective and varied.

THEORETICAL BASIS

According to Musfirah (2009), stimulation means awakening certain powers or abilities that already exist in the children, which are not coercive and do not include specific goals for these abilities. The importance of this stimulus in language learning means encouraging children to use language in communication to express their thoughts and feelings (Silawati, 2012).

Following the comprehensive goals and tasks of preschool education, the study direction of preschool children is very broad (Susanto, 2021). This means that the purpose of learning activities is not only for children to acquire some concepts of knowledge or skills, but also must aim to form attitudes and interest in learning and

develop various potentials and basic skills from an early age. According to Vygotski (1967), the encouragement of teachers and parents towards language learning in early childhood must be directed through play because playing is a source of development and forms a zone of proximal development (ZPD) (GRISPRILLA, 2018)

METHODS

The research method used was descriptive qualitative in which the researchers will observe directly and describe related data in the form of facts through the implementation of learning that was applied in group B-1 TK Aisyiyah Bustanul Athfal 1, Boyolali Regency. Data were collected through interviews with group B class teachers and observations from children's learning activities for one month. The subjects of this study were students with 16 children consisting of 11 girls and 5 boys. Meanwhile, the learning steps began with planning the implementation and evaluation of learning.

RESULTS AND DISCUSSION

The research results can be explained by the researcher starting from the beginning of the learning process carried out by children through playing activities, games that have been provided by the teacher with the arrangement of the playing environment which is made as good and as attractive as possible and providing media made from loose parts which are very diverse various forms and types to bring out the attractiveness and interest of children. Therefore, children enjoy playing and learning as they like, so children's learning independence can be realized.

A. Steps to implementing STEAM learning at TK Aisyiyah Bustanul Athfal 1

The application of STEAM learning at TK Aisyiyah Bustanul Athfal 1 Wonosegoro consists of several stages contained in the learning as follows:

1. Stage 1
 - a) Explain the purpose of learning
 - b) Questions and answers about musical instruments
 - c) Demonstration of how to use a musical instrument
2. Stage 2
 - a) Children observe the materials and tools that will be used in playing
 - b) Children listen to the teacher's explanation and carry out play activities according to children's interests: There are 3 groups of play tools and materials:
 - 1) Make a simple percussion instrument (*Kecrek*) with the media provided by the teacher: Plastic bottles used for drinking water, mung bean seeds
 - 2) Create writing/words "M-U-S-I-K" using letter dice
 - 3) Counting numbers using buttons, corn seeds, pebbles
3. Stage 3
 - a) The children tidy up the toys
 - b) The children demonstrate how to play the percussion instrument he has made
 - c) The children tell their experiences while playing
4. Stage 4
 - a) Discussing today's activities
 - b) Asking the children's feelings after participating in play activities
 - c) Strengthening children

B. STEAM learning activities in the school environment

STEAM (Science, Technology, Engineering, Art and Mathematics) is learning that is considered capable of integrating the skills (hard skills and soft skills) needed by STEM (Science, Technology, Engineering, and Mathematics)

students encouraging children to build knowledge about the world around children through observing, investigating, and asking questions. STEAM is a learning that has many benefits for children. Teachers and educators believe that with STEAM learning students will be more active and able to think critically in building their knowledge (Nugroho et al., 2019).

In the science lesson above, it can be concluded that children can prove themselves that if the bottle is filled with a little more mung bean seeds, it will produce a loud and loud sound compared to when the bottle is filled with a lot of mung bean seeds. The students also look capable of using loose-part materials that are around them with the arrangement of the environment that has been provided by the teacher with a different appearance from media from various loose parts, to attract the children's desire to explore his imagination independently of learning, children can repeat play activities until finding creative ideas or think critically, get new playing experiences and so on, so they do not depend on children's worksheets that only use one type of learning media.

1. Technology

Technology Learning (Technology) is applied in TK Aisyiyah Bustanul Athfal 1 Wonosegoro. In learning to make percussion instruments using used plastic bottles and mung bean seeds, the teacher used technological tools by using a projector to display a video of making percussion instruments using used plastic bottles, and mung bean seeds so students can carry out observing activities and the teacher can introduce Technology to early childhood.

The learning activities above in STEM learning at an early age can benefit students to get to know technology from an early age. Learning that uses technology as a learning medium has a positive impact on the development of cognitive, social, emotional, and physical aspects, from children who take part in learning only two children experience negative impacts from cognitive aspects and one child on social aspects. In research on children's cognitive abilities in terms of language, literacy, mathematics, science, digital literacy, cognitive abilities, etc., they experience many positive impacts and develop very well.

2. Engineering

Engineering is an understanding of how technology can be developed through engineering or design processes using project-based learning themes by integrating several different subjects. For example, children experience a process when they try to figure out how to make a strong foundation so that their building blocks can be taller (Nurjanah, 2020). In engineering, children can build thoughts and feelings in daily activities and stimulate aspects of development such as cognitive, language, emotional, physical-motor, and artistic (Wahyuningsih et al., 2020).

Engineering is essential to stimulate early childhood ability to assemble and build a specific form using relevant media (Munawar et al., 2019). Grouping students in engineering content requires personal responsibility to build and understand the material being studied, and create independent strategies in the learning process (Hadinugrahaningsih, et al., 2017).

Engineering Learning is applied in TK Aisyiyah Bustanul Athfal 1 Wonorego. In learning to make percussion instruments using used plastic bottles, and mung bean seeds, the medium used was used bottles. They were redesigned for use by children, such as percussion instruments. The children put a few mung bean seeds into the bottle. It turned out that it could produce louder and louder squeaking sounds, so the children could conclude that if the bottle was filled with a few mung bean seeds, it would produce a louder and louder sound compared to when the bottle filled with lots of mung bean seeds. In Engineering Learning conducted by TK Aisyiyah Bustanul Athfal 1 Wonorego, it has the benefit that children can also express the process of solving problems in their knowledge of the design of doing their work.

3. Art

Art, in this case, is not just coloring or scribbling on paper with crayons or paint but showing the non-analytical and creative side of one's brain. Art in childhood helps children express what they know and what they feel so that they can express themselves through art. Artwork owned by children is an expression of the beauty of an event that is felt.

In art lessons, making percussion instruments using used plastic bottles and mung bean seeds conducted by TK Aisyiyah Bustanul Athfal 1 Wonosegoro was aimed at students who make percussion instruments. The teacher's goal was to teach how to make percussion instruments using used plastic bottles, and mung bean seeds because they wanted to include art elements in learning. Educating children through art is not only for gifted children but also art for developing one's potential and growing one's creativity. Art education in children is directed to the formation of attitudes so that there is intellectual balance, sensibility, rational and irrational, reason and emotional sensitivity, making humans physically and mentally skilled, motor, cognitive, and psychomotor abilities develop properly and optimally. The children's personality will gradually develop and affect the function of the soul.

4. *Mathematic*

Mathematics encompasses a wide range of subfields, skills, and systems, many of which are appropriate for young children to learn in some form. The purpose of introducing mathematics to early childhood is for children to know the basics of learning to count/mathematics so that later the children will be better prepared to learn mathematics at the next, more complex level of education. Knowledge of mathematics has actually been introduced from the age of birth to 6 years (from an early age). The concept of learning for children under 3 years of age can be found in their daily activities, for example, children pouring water from one container to another and being taught to count small beads and large beads (Roostin & Swandhina, 2019).

Mathematics Learning applied at TK Aisyiyah Bustanul Athfal 1 Wonosegoro is to make percussion instruments using used plastic bottles and mung bean seeds. Learning that includes Mathematics is shown to form the word "M-U-S-I-K" using letter dice and counting numbers using clothes buttons, corn kernels, and pebbles.

Mathematics learning by making percussion instruments using used plastic bottles, and mung bean seeds carried out at TK Aisyiyah Bustanul Athfal 1 Wonosegoro showed that teachers introduced math games to early childhood including teaching children based on correct mathematical concepts, avoiding

math fears from the start, helping children learn math naturally through playing, telling stories, and singing.

C. Loose-parts media supporting learning activities with STEAM

From the results of the data obtained by the researchers during learning with media made from loose parts in group B-1 TK Aisyiyah Bustanul Athfal 1 Wonosegoro, the researchers found the reality in the field that learning activities with STEAM mean that children play and learn very happily by experimenting with loose part as learning media. The important parts of these stages are explained in the learning activity step.

Table 1. Steps of learning activities with STEAM

No	Parts	Description
1.	Activity title	Making percussion instruments from used plastic bottles, and mung bean seeds
2.	Activity goals	<ol style="list-style-type: none"> 1. Children are used to praying before and after activities 2. Children show an independent attitude 3. Children can make simple percussion instruments 4. Children can move freely according to the rhythm they hear 5. Children can say the letters in the word "M-U-S-I-K" 6. Children can count numbers using buttons, corn seeds, and pebbles.
3.	Tools and Materials	Tools and Materials: Percussion Instruments: used plastic bottles, mung bean seeds, number dice, clothes buttons, corn kernels, and pebbles.
4.	Activity steps	In the first activity, the children practiced science by making percussion instruments from used plastic bottles, and mung bean seeds. When the children put lots of mung bean seeds into the plastic bottle, then closed it tightly and sounded a soft sound, then another child conveyed his ideas. Adding fewer mung bean seeds into the bottle can actually produce louder and louder squeaking sounds. Thus, the children could conclude that if the bottle was filled with a few mung beans, it would produce a louder and louder sound than when the bottle was filled with many mung beans. Students were also seen to be able to use loose-part materials around them with the environmental arrangement that has been provided by the teacher with a different appearance with media from a variety of loose parts, so they would be attracted and had the desire to explore his imagination independently. The children could repeat playing activities

		<p>until they found creative ideas or thought critically, got new playing experiences, and so on, not depending on children's worksheets that only use one type of learning media.</p> <p>In the second activity, the children's play activities used learning media using number dice with the main activity of arranging letters into one word "m-u-s-i-k", while in the third play activity, they counted using media buttons, corn seeds, and pebbles.</p> <p>In the third activity, the children tidied up the playing instruments, demonstrated how to play percussion instruments that they have made, and shared their experiences while playing.</p>
5.	Conclusion	<p>Students were also seen to be able to use loose-part materials that are around them by structuring the environment that has been provided by the teacher with a different appearance from media from various loose parts, so it could attract the children's desire to explore their imagination in independent learning. Children could repeat playing activities until they found creative ideas or thought critically, got new playing experiences, and so on, so they didn't depend on children's worksheets that only use one type of learning media.</p>

D. Observation results of learning with STEAM using loose-parts media

Table 2. Observation Results of Loose Parts-Based Learning

Basic Competency	Indicator	Scoring			
		BB	MB	BSH	BSB
Appreciating yourself, the surrounding environment as gratitude to God (Name 1.2)	How to appreciate friends' works.	2	1	8	5
Showing a behavior that reflects curiosity (Kog.2.2) Observing why bottles can produce different sounds when filled with a lot of content and a little	Showing a behavior that reflects curiosity (Kog.2.2) Observing why bottles can produce different sounds when filled with a lot of content and a little	1	1	7	7
Recognizing literacy through playing (bhs.3.12-4.12) Composing letters into musical words	Recognizing literacy through playing (bhs.3.12-4.12) Composing letters into musical words	3	3	6	4
Having behavior that reflects an aesthetic attitude (art 2.4) Maintaining tidiness so as not to get dirty	Having behavior that reflects an aesthetic attitude (art 2.4) Maintaining tidiness	2	5	3	6

	so as not to get dirty				
Using limbs for fine and gross motor development (FM 3.3-4.3)	Using hands to move percussion bottles so they can make sounds	0	1	7	8
Showing behavior that reflects a patient attitude (willing to listen when other people talk, willing to wait their turn to practice discipline (Sosem 2.7)	Patiently listening when other people talk	6	3	3	4

The table above also shows that children use their limbs to develop of fine and gross motor skills properly. Therefore, it can be seen that in learning based on loose parts, some children can achieve KD. In making narratives and describing the teacher can take from the observations in an assessment format. The narrative described by the teacher describes the information or data about the children's ability which is combined between the ability before and after using learning media made from loose parts. The work produced by children showed that children could feel independence in learning.

During the playing process, the teacher and vice versa can ask various kinds of open questions. This event is essential and provides opportunities for children to think critically.

The results showed that most children in TK Aisyiyah Bustanul Athfal 1, Wonosegoro District, could mostly achieve KD in learning. Loose part-based STEAM learning implemented in TK Aisyiyah Bustanul Athfal 1 Wonosegoro District affected the increase of building relationships, developing creativity, leadership, gaining self-confidence, and independence at an early age. The explanation above follows the results of an interview with the head of TK Aisyiyah Bustanul Athfal 1, Wonosegoro District, who stated that this loose part can be chosen to be a medium for learning in early childhood. Using Loose part-based STEAM learning has the privilege of using various forms of media, various components of objects, various ways to use them, and various attractive colors in 1 learning process activity. The loose part can be used as a learning strategy to develop various children's skills compared to other learning. The loose part is also easy to implicate in the learning process because it uses materials available in the surrounding environment. Used

materials can be used in learning because it makes children think that used materials can be used as interesting materials. Loose-part media learning apart from having many benefits for teachers and children also has drawbacks. Learning using used media requires special time and attention from the teacher because the teacher must pay attention to the children's attitude in dealing with loose-part objects.

CONCLUSION

From the research results above, it can be concluded that learning based on Science, Technology, Engineering, Art, and Mathematics (STEAM) can provide benefits for students to get to know technology from an early age. Learning that incorporates elements of Science, Technology, Engineering, Art, and Mathematics as learning media has a positive impact on the development of cognitive, social, emotional, and also physical aspects, of the children who take part in learning, only two children experience negative impacts from cognitive aspects and one child on the social aspect. In research on children's cognitive abilities in terms of language, literacy, mathematics, science, digital literacy, cognitive abilities, etc., they experienced many positive impacts and develop very well. The results also showed that learning with loose-part media could provide freedom to play and learn so that it could build independent early childhood learning. This can be seen in increasing children's creativity, encouraging children to be active in their learning, increasing children's independence, training children's ability to work together, and build self-confidence in children.

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