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Exploring STEAM (Science, Technology, Engineering, Arts, And Mathematics) With Loose Parts Media In Kindergarten

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ABSTRAK
Penelitian ini merupakan penelitian kualitatif deskriptif dengan tujuan untuk mendeskripsikan eksplorasi STEAM dengan menggunakan media Loose Parts. Penelitian dilaksanakan dengan teknik purposive sampling di TK Arrahmah Kabupaten Ogan Ilir. Partisipan dalam penelitian adalah anak 5-6 tahun. Teknik pengumpulan data dilaksanakan dengan Observasi dan wawancara selanjutnya dilakukan proses reduksi data, analisis, dan verifikasi data. Hasil penelitian menunjukkan bahwa STEAM dengan media Loose Parts memberikan respon yang positif hal ini terlihat bahwa anak-anak lebih bersemangat untuk berpartisipasi dalam kegiatan pendidikan, memiliki minat yang lebih besar, lebih sering mengajukan pertanyaan, lebih bersemangat, berani, dan percaya diri saat mengekspresikan pikiran mereka, dan mereka bekerja sama satu sama lain untuk membantu teman. Selain itu, media loose parts juga mendorong anak-anak untuk berpikir kritis, imajinatif, dan inovatif saat memecahkan masalah sendiri. Saat pembelajaran guru perlu memberikan tantangan berupa pertanyaan pemantik.

Kata kunci: *STEAM, Loose parts, Anak Usia Dini*

ABSTRACT
This study is a form of descriptive qualitative research with the goal of describing the events that will be transparently observed regarding the settings and interactions in investigating STEAM using Loose Parts medium. The study was conducted in the Ogan Ilir District's Arrahmah Kindergarten. By using the purposive sampling strategy, the data were gathered. Participants in this research were children aged 5-6 years who were in kindergarten and had an ECE teacher. Observation and interviewing as data collection methods. Data reduction, analysis, and verification processes are carried out after data collection. The outcomes demonstrated that STEAM with Loose Parts media received favorable feedback. Children are more excited to participate in educational activities, they have greater interest, they ask questions more frequently, they are more excited, daring, and confident when expressing their thoughts, and they cooperate with one another to aid friends. Additionally, loose components media encourages children to think critically, imaginatively, and innovatively while solving problems on their own. Children's emotional states and lack of attention are challenges for teachers. In order to capture students' attention, teachers use open-ended questions and motivating encouragement.

Keywords: *Exploring STEAM, Loose Parts, Early Childhood*

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INTRODUCTION

Each child is born with a unique set of skills, which emerge as a result of the dynamic interaction between one's individuality and external factors. Child has various behavioral traits than adults (Santrock, 2021).. The term "golden age" refers to this era. The process of growth and development is at its fastest point in the human life span between the ages of 0 and 6 years (Bennett et al., 2008). to support the growth and development of children, education is provided with PAUD services. The purpose of early childhood education is to encourage the growth and development of children as a whole and healthy.

Early childhood are highly curious about occurrences in their surrounding (Sumarni, 2013). Children require flexibility to develop their talents. Play is, in theory, the best form of early childhood education. According to Pramitha et al (2018) children who play increase their creativity, imagination, self-will, self-confidence, physical motor skills, social-emotional skills, and cognitive abilities. Playing in kindergarten is meant to be imaginative and enjoyable (Suryani, 2022). Children learn new things and get fresh experiences through playing and exploring their environment. Appropriate learning for early childhood emphasizes the principle of hands-on activity. Teachers are still fixated on traditional teacher-centered learning methods, so children do not get the opportunity to learn independently and exploratively. therefore, children do not get maximum stimulation.

According to Qomariyah and Qalbi (2021) a need for changes in the way of learning including in early childhood so that when children grow up, they will have the ability and be able to compete, (1) Self-study; (2) Looking for information; (3) Using real-world challenges; (4) Using unstructured problems; (5) Contextualize knowledge; (6) Using Higher Order Thinking Skills (HOTs); (7) Children determine the scope and issues of learning; (8) Peer learning; (9) Peer evaluation; (10) Group work; (11) Multi-disciplinary learning; and (12) Process skills assessment.

21st century learning solutions for early childhood are related to the demands obstacles and needs of life, including communicating effectively, the ability to organize information, mastery of technology, critical thinking skills, self-control, problem-solving skills, and cooperation. Regarding the important role of teachers in schools, especially kindergartens, an approach is needed to develop children's creativity and other skills. STEAM is one of the right learnings given from an early age (Shaw et al., 2021). This is because STEAM Learning is a learning approach combining Science, Technology, Engineering, Art, and mathematics.

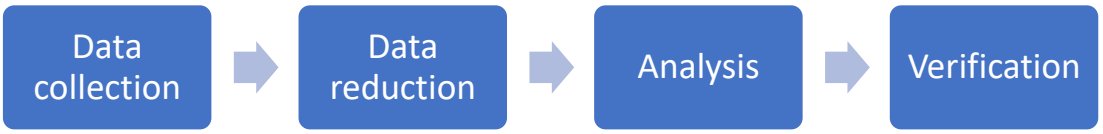
Science, technology, engineering, arts, and mathematics are together referred to as STEAM. The core idea of STEAM is that children have a high level of intrinsic, instinctual curiosity, creativity, teamwork, critical thinking, and artistic components from an early age (Hong et al., 2020). Numerous studies demonstrate how the advantages of STEAM learning may stimulate kids' growth till they have a competitive spirit that can be created in the 21st century and hard skills that are balanced with soft skills abilities (Hunter - Doniger, 2021). Previous studies have indicated that STEAM education gives kids the chance to explore, analyze, and create as part of scientific inquiries. With a hands-on, mind-on approach, scientific inquiry challenges the child to employ higher-order thinking abilities to solve issues (Butera et al., 2016).

STEAM was introduced early by utilizing simple equipment that is around, namely *Loose Parts*. STEAM was introduced early by utilizing simple equipment that is around, namely *Loose Parts*. STEAM-based learning is taught in an integrated manner that can utilize surrounding media that is close to the child's environment. Project-based learning provides challenges and encourages children to work together. The use of loose parts media can develop children's creativity. Previous research has shown that the benefits of playing with Loose Parts are that it increases creativity and imagination, children become physically more active, children become cooperative, and they remain focused and cognitive (Shafi'i &; Dianah, 2021). According to prior studies, playing with loose parts encourages children to be more imaginative and creative, gets them moving more, fosters cooperation, and keeps them focused and cognitive (Ratna et al., 2023).

The observations made by researchers on learning activities in Arrahmah Kindergarten have implemented independent learning with STEAM. Exploration with STEAM allows children to learn various sciences holistically. The use of loose parts media is also to build children's independence in exploring new knowledge and support children to think critically. Therefore, researchers are interested in researching Exploring STEAM with Loose Parts Media in Arrahmah Kindergarten Ogan Ilir District.

RESEARCH METHOD

This research is a type of descriptive qualitative research that aims to describe the circumstances that occur that will be observed transparently about the conditions and interactions that occur in exploring STEAM with Loose Parts media (Sugiyono, 2018). The research location was in Arrahmah Kindergarten Ogan Ilir District. The data were collected by purposive sampling technique. Participants of this research were young children aged 5-6 years who attended kindergarten and ECE teacher. Data collection techniques using observation and interviews. After the data is collected, data reduction, analysis, and verification activities are carried out (Huberman & Miles, 2002). The following is a descriptive qualitative research flow chart.



Picture 1. Descriptive Qualitative Flow chart

RESULT AND DISCUSSION

a. STEAM Lesson Plan at Arrahmah Kindergarten

Curriculum 2013 (K13) and STEAM-based learning have a mutually supportive relationship in achieving the goals of holistic education for early childhood. The 2013 Curriculum (K13) for Early Childhood Education (ECED) emphasizes the holistic development of early childhood which includes aspects of religious and moral development, social-emotional, cognitive, language, and physical-motor skills.

Arrahmah Kindergarten uses the 2013 Curriculum in the learning process applied in school institutions. Learning indicators, The 2013 curriculum in Arrahmah Kindergarten is adjusted to the level of child development referring to the Child Development Achievement Level Standard (STTPA) in Permendikbud number 137 of 2014 and Permendikbud 146 of 2014. In the 2013 curriculum, learning is carried out in three stages, (1) learning planning, which is a reference made to facilitate the learning process, consisting of semester programs, RPPM, and RPPH, (2) implementation, which is an activity to develop children's potential according to predetermined standards adjusted to lesson plan (RPPH), (3) assessment, activities to determine the achievement of child development. The following in table 1 is lesson plan at Arrahmah Kindergarten.

Table 1. Lesson Plan at Arrahmah Kindergarten

Semester/Week to/Day to	:	I/11/1
Age Group	:	5-6 Years
Theme	:	Plant
Subtopic	:	Beside
Time Allocation	:	07.00 – 10.00
Indicator	:	1 – 2. 3 – 2. 4 – 3 . 2 – 4 .2 – 3 . 6 – 4 . 6 – 3 . 11 – 4 . 11 – 3 . 15 – 4 . 1 - Recognize good behavior as a reflection of noble morals - Get to know the surrounding objects (name, color, shape, size, pattern, nature, sound, texture, function, and other characteristics) - Understand expressive language (expressing language verbally and non-verbally) - Get to know various works and art activities - Conduct daily worship activities with the guidance of adults - Showing polite behavior as a reflection of noble morals - Convey about what and how objects around him are known (name, color, shape, size, pattern, nature, sound, texture, function, and other characteristics) through various works

		- Demonstrate expressive language skills (expressing language verbally and non-verbally) - Showing works and art activities using a variety of media
Learning Objectives	:	- Love and care with plant - Giving thanks - Have a healthy living behavior, - Curious, creative and aesthetic, - The child can be confident, disciplined, independent, caring, - Children are able to respect and tolerate others - Children are able to adjust to the surrounding environment - Children are able to be honest, humble, and polite in interacting with family, educators, and friends.
Material	:	- Chili plants - Various kinds of chilies - Planting chili seedlings - Chili growth - Caring for chili plants - Pat the chili letters - Interested in art activities
Tools and materials	:	- Chili plants - Chili seeds - Polybags - Shovels - Sprinklers - Soil - Water
Learning Activities		
A. Opening Activity		
1. Implementation of opening SOP 2. Discuss chili plants 3. Discuss about caring for chili plants 4. Discuss the types of chilies 5. Mimic the Movement of Chili Plants 5. Introduce the activities and rules used to play		
B. Core Activity		
1. Shows the parts of the chili plant 2. Planting chili plants		

3. Counting 4. Narrate and show the work
C. End Activity
1. Ask her how she feels during the day 2. Discuss what activities he has played today, what toys he likes the most 3. Short stories containing messages 4. Inform activities for tomorrow 5. Implementation of closing SOP
D. Assessment Plan 1. Attitude a. Can appreciate and love plants as creatures created by God b. Use polite words when asking questions 2. Knowledge and skills a. Can show parts of chili b. Can tell the growth of chili c. Can explain the types of chilies

STEAM-based learning with its integrative, practical, and learner-centered approach is in line with the objectives of K13 to produce the next generation of the nation who are ready to face the challenges of the 21st century. Early childhood 21st-century learning requires learning that integrates the ability of knowledge skills, skills, and attitudes as well as mastery of technology. The learning process focuses more on the 4Cs (*Communication, Collaborative, Critical thinking, and Creativity*) (Prameswari & Lestariningrum, 2020). STEAM-based learning given to children from an early age produces young scientists who are creative, innovative, think critically, communicate and collaborate. Then, STEAM learning provided as early as possible shows a positive relationship to academic success in the future. STEAM can be introduced early by utilizing simple equipment around us, namely Loose Parts (Nurjanah, 2020).

Based on observations made by STEAM learning at Arrahmah Kindergarten on planting chili plants. The topics chosen were chili planting activities on the plant theme and chili subthemes. Before sowing seeds, children need to be given reinforcement about the types of tools and materials and their functions so that children are not confused when doing actions. Tools and materials in question such as polybags, shovels, sprinklers, chili seeds, planting media, and water. Then, explain to the children the steps of implementing the activity. At the end of the activity, the child is directed to find objects around him that can produce activities as already done with chilies. By STEAM learning gives children the opportunity to expand their knowledge in the sciences and humanities and at the same time develop the skills needed to thrive in this

21st century – such as communication skills, critical thinking skills, leadership, teamwork, creativity, toughness, and other skills. The use of STEAM-based learning develops creativity and knowledge of the beauty of art which is integrated into science so that children's creative power increases.

b. Exploring STEAM in chili planting activities

STEAM learning at Arrahmah Kindergarten. The topics chosen were chili planting activities on the plant theme and chili subthemes. Children exploring STEAM on planting chili plants. For the Science learning activities are focused on material concepts about chili. Children planted chili seed in a soil container. Then chili seed grow getting bigger day by day. Through observation, study, and experimentation children develop curiosity, pleasure and willingness to understand knowledge about chili.

The equipment used as technology in chili planting activities are flowerpots, plant waterers, and mini shovel. The concept of engineering is cultivating the soil as a medium by mixing the soil with husks and fertilizers. The art activity carried out is decorating flowerpots. children bring out the creations of their imagination in decorating flowerpots. Calculate the amount of soil for one polybag, the number of chili seeds, the amount of water for watering, and the height of the plants. As children shovel soil into flower pots. children count how many shovels of soil are in the flowerpot. then count the number of chili seeds. this is an activity that stimulates children's math skills. The following in table 2 is exploring STEAM activities at Arrahmah Kindergarten.

Table 2. Exploring STEAM Activities at Arrahmah Kindergarten.

STEAM Learning	Exploring Activity
Science	Chili seeds planted in a soil container will appear/grow plants that are getting bigger day by day.
Technology	A tool used when the soil is loosened (in the tillage process), planting chili seeds in the soil.
Engineering	Cultivate the soil as a medium by mixing the soil with husks and fertilizers.
Arts	Decorating flowerpot
Mathematics	Calculate the amount of soil for one flowerpot, the number of chili seeds, the amount of water for watering.

c. Loose Parts Media

Loose parts are materials that are open and separate and can be moved, carried, combined, redesigned, separated, and reunited with natural or synthetic materials in various ways. There are 7 types of *loose parts*, namely (1) natural materials, (2) plastic, (3) metal, (4) wood and bamboo, (5) yarn and fabric, (6) glass and ceramics, (7) used packaging (Haughey & Hill, 2017). *Loose parts* provide opportunities for children to increase their fantasy and imagination in creating unlimited creations that stimulate children's creativity. Imagination is the basis of creative problem-solving (Beloglovsky & Daly, 2016). Imagination brings together children's knowledge and helps in applying that knowledge in innovative and inspiring ways. STEAM made from Loose Parts can be implemented in education for early childhood to improve children's skills and abilities, support children's creative freedom, and support various aspects of their development positively. By playing Loose Parts, children's thinking skills can develop, in other words, Loose Parts is effective for developing children's thinking skills (Priyanti &; Warmansyah, 2021).

The types of loose parts used in chili planting activities are natural and plastic materials. (1) Soil, chili seeds (natural material); (2) Flowerpot, used glass (plastic material). The concept of STEAM learning seen when children plant chilies is to encourage children to build natural thinking designs and be able to complete the tasks given, help children combine interdisciplinary understanding, and motivate them to assume holistically interactively. Exploring STEAM with Loose Parts media, the results were received and responded to enthusiastically by students. This can be seen from changes in children's learning behavior. As for the positive behavior of children, namely increased curiosity, children are more active in asking, happy, excited, brave, and confident in expressing their opinions, and working together to help friends. In line with previous research STEAM learning objectives for early childhood make children more active in participating in activities that have been designed by teachers (Rahardjo, 2019). It also provides a fun experience and interaction with both friends of the same age and adults with fun, that's what is really needed (Kastriti et al., 2022).

The loose part is a medium that can help children stimulate creativity. In addition, the materials used for making this media are easy to find around children, making it easier for them to be able to appreciate objects around them (Beloglovsky & Daly, 2016). When children play and learn through STEAM learning by utilizing Loose Parts media in chili planting activities, children are also emphasized about social-emotional learning and independence with habituation. In addition to academics, other fields such as social skills, religious knowledge, and children's independent character have progressed. In line with the results of previous research that STEAM learning activities supported by Loose parts media stimulate children to solve problems independently (Perignat &; Katz-Buonincontro, 2019), critical thinking (Qomariyah &; Qalbi, 2021), creatively, and innovatively (Shatunova et al., 2019).

When children conduct scientific investigations through STEAM-based learning, children can develop various aspects of development. In implementing STEAM learning with a scientific approach, teachers set complete activities and main / activity materials,

not dominated by lectures solely by teachers. The implementation of this activity is carried out through a scientific approach that can provoke children to observe, question, collect information, and reason to communicate (Tabiin, 2020).

CONCLUSION

STEAM is a learning approach that combines Science (the study of knowledge), Technology (the study of products made for human needs), Engineering (the study of design processes used to solve problems), Art (the study related to creation and creativity), and Mathematics (the study of the language of shapes, symbols, and numbers). This STEAM-based learning is right to be given to children. Scientific investigations conducted while playing in STEAM activities can build children's motivation to learn. In addition, STEAM-based learning support media can utilize materials in the environment around children so that learning activities at home with STEAM will be more fun.

Based on research conducted at Arrahmah Kindergarten learning activities with Loose Parts gave a positive response. Children are more enthusiastic about participating in learning activities, increased curiosity, children are more active in asking questions, happy, excited, brave, and confident in expressing their opinions and working together to help friends. In addition, Loose parts media stimulates children to solve problems independently, and critically thinking, creatively, and innovatively. The obstacles experienced by teachers are children's emotional state and lack of attention. Therefore, teachers provide motivational support and open-ended questions to attract children's attention.

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