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Loose Part Based STEAM Learning Using Local Wisdom of East Manggarai

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ABSTRAK

Kegiatan pembelajaran untuk anak usia dini yang kurang optimal berdampak pada kurang terstimulasinya perkembangan anak. Berdasarkan hal tersebut maka tujuan penelitian ini yaitu untuk menganalisis Pembelajaran STEAM Berbasis Loose Part *Dengan Kearifan Lokal Manggarai Timur pada anak usia dini. Jenis penelitian ini yaitu penelitian kualitatif. Metode penelitian yang digunakan adalah metode studi kasus. Subjek dalam penelitian ini adalah siswa kelas B berjumlah 20 orang. Metode pengumpuan data pada penelitian ini berupa wawancara, angket, dan dokumentasi. Instrumen yang digunakan dalam mengumpulkan data yaitu pedoman observasi, dan wawancara. Teknik analisis data penelitian yaitu analisis deskriptif kualitatif melalui analisis data Model Miles dan Huberman. Hasil penelitian menunjukan bahwa pertama, pembelajaran STEAM berbasis* Loose Part *dengan kearifan Lokal Manggarai timur bersifat sederhana, artinya kegiatan yang diterapkan bagaimana mengenalkan pada anak tentang budaya sekitar dan membiasakan anak untuk mencintai budaya setempat. Kedua Guru merancang kegiatan pembelejaran memuat unsur kearifan lokal sesuai tema, sub tema kegiatan, melakukan perencanan, memfasilitasi, evaluasi. Ketiga, pemanfaatan lingkungan sebagai sumber belajar dengan menggunakan ala dan bahan yang bersumber dari sekitar lingkungan anak tinggal. Disimpulkan bahwa Pembelajaran STEAM Berbasis* Loose Part *Dengan Kearifan Lokal Manggarai Timur dapat menstimulasi anak usia dini.*

ABSTRACT

Learning activities for early childhood that could be more optimal impact children's development, causing them to be less stimulated. Based on this, this research aims to analyze Loose Part Based STEAM Learning with East Manggarai Local Wisdom in early childhood. This type of research is qualitative research. The research method used is the case study method. The subjects in this research were 20 class B students. Data collection methods in this research are interviews, questionnaires, and documentation. The instruments used to collect data were observation guidelines and interviews. The research data analysis technique is a qualitative descriptive analysis using the Miles and Huberman Model data analysis. The research results show that first, loose part-based STEAM learning with East Manggarai local wisdom is simple, meaning that the activities implemented are how to introduce children to the surrounding culture and get them used to loving local culture. The two teachers design learning activities containing elements of local wisdom according to the theme, sub-theme of the activity, planning, facilitating, and evaluating. Third, the environment can be a learning resource using tools and materials from the child's environment. It was concluded that Loose Part Based STEAM Learning with East Manggarai Local Wisdom can stimulate young children.

1. INTRODUCTION

The basic concept of early childhood education is an effort to stimulate developmental tasks to become optimal in preparing for subsequent developmental tasks. The aim of education at an early age is to facilitate the child's overall growth and development or emphasize the development of all aspects of the child's personality (Aprita & Kurniah, 2021; Halawa, 2021; Humaida & Suyadi, 2021). PAUD provides an opportunity to develop a child's personality. Therefore, educational institutions for early childhood need to

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provide various activities that can develop various aspects of development, including religious and moral values, physical motor, cognitive, social-emotional, language, and arts (Aryani & Ambara, 2021; Hidayat et al., 2021). At an early age, the sensitive period, critical period, and golden age occur (Ariani & Ujianti, 2021; Nurfadilah, 2021). The curriculum is the basic foundation of a school for carrying out the learning process and is a reference for schools to achieve educational goals (Monica & Yaswinda, 2021; Wiyani, 2022). Ability, hard work, and creativity are some of the factors needed to encourage optimal learning outcomes (Aprita & Kurniah, 2021; Halawa, 2021; Humaida & Suyadi, 2021; Nisa et al., 2021; Sutama et al., 2021). The difference between PAUD and other levels of education is that PAUD is a form of education that focuses on laying the foundation for the growth and development of fine and gross motor coordination, emotional intelligence, multiple intelligences, and spiritual intelligence.

However, the current problem is that many learning activities for early childhood could be more optimal. Previous research findings also state that non-optimal learning activities stimulate children's development less (Handayani & Sinaga, 2022; Irhamna & Purnama, 2022; Murdijanti et al., 2022). Other research findings also reveal that currently, many teachers still have difficulty determining innovative learning models that can stimulate young children in the classroom (Lestariani et al., 2019; Wahyuni et al., 2020). Based on the results of observations and interviews with teachers at PAUD Pelita Harapan, it was revealed that learning activities have not implemented various learning strategies. Apart from that, learning activities do not apply learning based on local wisdom. Learning based on local wisdom around children can help stimulate children's development in getting to know the surrounding culture. The Head of PAUD, Pelita Harapan, explained that learning would involve people who understand culture, for example, ata gagi (village heads). This aims to ensure that students genuinely understand culture. However, in its implementation, the teacher has not demonstrated learning activities based on the characteristics of the East Manggarai area.

Based on these problems, the solution is to apply Loose Part-based steam learning with the local wisdom of East Manggarai. The learning activity system is packaged as play and exploration at the Early Childhood education level. The approach that can be used is related to STEAM, which aims to encourage students to build knowledge about the world around them through observing, asking, and investigating (Hobri et al., 2021; Putu et al., 2021). STEAM learning teaches science, technology, engineering, and mathematics in an integrated manner by adding elements of local wisdom from East Manggarai Regency to learning activities. STEAM learning with local wisdom is a contextual learning approach that integrates several scientific disciplines (Kumalasani & Kusumaningtyas, 2022; Pasani & Amelia, 2021). This will direct students to develop knowledge about local wisdom and several skills, namely problem-solving skills, critical thinking, and collaboration. Previous research states that STEAM stimulates students' curiosity and motivation regarding high-level skills consisting of problem-solving, collaboration, independent learning, project-based learning, challenge-based learning, and research (Degeng et al., 2021; Prameswari & Anik Lestariningrum, 2020; Rahardjo, 2019; Rahmawati et al., 2018).

Early childhood (AUD) is entirely of curiosity about what is around them. Children generally will be very enthusiastic about exploring knowledge about things related to the natural world around them (Az-Zahra et al., 2022; Murdijanti et al., 2022). Local wisdom is implemented in every learning activity. This is an effort to educate children to use their minds to act and behave towards objects or events in a location (Dewi, 2019; Wiyani, 2022). Local wisdom-based learning is a strategy for creating a learning environment and designing learning experiences that integrate culture into the learning process (Dewi, 2019; Erviana & Faisal, 2022; Wiyani, 2022). Learning activities will also improve if you apply Loose, part-based STEAM learning. Loose parts are playing tools with various components from natural materials around us. Loose parts are open items that are easy to find in everyday environments, such as twigs, pinecones, stone shells, flowers, and other natural objects (Fikriyati et al., 2023; Rahardjo, 2019). Through loose part media, children can connect themselves with their environmen

Previous research findings reveal that through loose parts, children will be allowed to interact directly with their immediate environment (Prameswari & Anik Lestariningrum, 2020; Rahardjo, 2019). Other research also reveals that loose part media is an intermediary in improving children's ability to think critically, imagine, see solutions, and explore, especially when children explore play experiences to the fullest (Mubarokah, 2021; Novita Eka Nurjanah, 2020). Other research also reveals that STEAM learning invites students to understand phenomena that occur in everyday life so that it can significantly improve student learning outcomes (Luamba & Tandapai, 2022; Sigit et al., 2022; Wahyuningsih et al., 2020). STEAM encourages children to explore all their abilities in their way. However, there has yet to be a study regarding Loose Part Based STEAM Learning Using Local Wisdom in East Manggarai. Based on this, this research aims to analyze Loose Part Based STEAM Learning with East Manggarai Local Wisdom in early childhood.

2. METHODS

This type of research is qualitative research. The research method used is the case study method. Case study method research explores programs, events, processes, and activities with one or more people (Sugiyono, 2019). A case is bound by time and activities, and researchers collect detailed data using various procedures over a continuous period. The case study research method is used to find out in-depth about a program, event, process, or activity for one or more people and to analyze loose part-based STEAM learning with local wisdom from East Manggarai at PAUD Pelita Harapan. In qualitative research, the focus is based more on the level of novelty of information that will be obtained from social situations (the field). The novelty of the information can be an attempt to understand the social situation more broadly and deeply. However, there is also a desire to produce new hypotheses or knowledge from the studied social situation. This research focuses on analyzing loose part-based STEAM learning with local wisdom from East Manggarai for group B students at PAUD Pelita Harapan. The subjects in this research were 20 class B students. The informants in this research were the Principal and Teachers of PAUD Pelita Harapan

The location of this research was PAUD Pelita Harapan Jl. Trans Flores, Kota Komba District, East Manggarai Regency, NTT. Observation, interview techniques, and documentation are used to collect research data. Not directly involved in the activity to be observed. This research uses direct observation at PAUD Pelita Harapan regarding loose part-based STEAM learning with local wisdom from East Manggarai. Interviews were conducted with Pelita Harapan PAUD principals and teachers regarding loose part-based STEAM learning with local wisdom from East Manggarai. The documents used in this data collection technique are learning planning documents, school curriculum, and activity documentation related to loose part-based STEAM learning activities with local wisdom from East Manggarai. The instruments used to collect data were observation guidelines and interviews. The instrument grid is presented in Table 1.

Table 1. Lembar Wawancara dengan Guru

No.	Research Focus	Question
1	Application of STEAM learning with local wisdom	1. How do you design STEAM learning activities based on the local wisdom of East Manggarai? 2. What do you need to prepare for STEAM learning using local wisdom from East Mangagrai? 3. What is your role in facilitating STEAM learning activities with local wisdom? 4. Do you need to evaluate activities?
2	Stages of using loose part media. With local wisdom	1. Are the children enthusiastic when they are at the exploration stage in learning activities? 2. Do the children concentrate when doing experiments? 3. Do the children concentrate when carrying out creative activities in learning? 4. How do you carry out the educational stage of learning activities? 5. How do you carry out the expansion stage in learning activities?
3	Strategy for using loose parts.	1. How do you introduce the strategy of using loose part media? 2. How do you introduce strategies for tidying up and storing things to your children? 3. How do you introduce media that comes from the surrounding environment?

The technique used to analyze data is qualitative descriptive analysis. The analysis is carried out through the Miles and Huberman Model data analysis, namely the ongoing or flowing data analysis model (flow model analysis); there are four activities carried out, namely: data collection, data reduction, data display, and verification/concluding (Sugiyono, 2019). Triangulation is used in research until the researcher obtains data and tests whether the data obtained is reliable and actual (Sugiyono, 2019). In this research, data validity testing techniques were carried out using triangulation, including data collection techniques, data sources, and time triangulation.

In the data collection triangulation technique, researchers collect data using observation, interview, and documentation techniques and then test them individually using several data collection techniques on informants to obtain valid and justifiable conclusions. Source triangulation is carried out to test the credibility of data by checking data obtained from various data sources such as interviews, archives, and other documents. In this research, time triangulation will be carried out repeatedly to obtain valid data to obtain data validity because humans experience changes from time to time. However, this research will mainly be carried out in the morning and afternoon because activities are still being carried out at school.

3. RESULT AND DISCUSSION

Result

The study time at PAUD Pelita Harapan is 5 days. Children who start school at 3-4 years until the initial session will enter the class A group, and those aged 5-6 years will enter the class B group. PAUD Pelita Harapan also accepts students with special needs. The Pelita Harapan PAUD curriculum in 2015-2020 uses the 2013 curriculum by linking the local curriculum or Education Unit Level Curriculum (KTSP) by outlining semester programs, weekly learning plans, and daily learning plans. In 2021, PAUD Pelita Harapan passed the selection to become the first-generation driving school for East Manggarai Regency and began implementing the independent curriculum. Teachers' method of compiling teaching modules is based on the independent curriculum guidelines. Designing teaching modules is also by the learning theme with topics that suit the conditions of the educational unit, which is oriented towards achieving three elements of child development consisting of elements of religious values and character, identity, and the basics of STEAM literacy, as well as the dimensions of the Pancasila profile. The number of teaching staff at PAUD Pelita Harapan is 4 people. The number of students who carried out this research was 48.

The designs and methods prepared by teachers in STEAM learning using discussion, project, and lecture methods at PAUD Pelita Harapan are as follows: First, science. Project and experimental methods are usually carried out in science activities based on local wisdom. Science generally covers three areas, namely: 1) physical science. Several concepts usually introduced at PAUD Pelita Harapan recognize differences in color, shape, size, texture, weight, light, light, dark, fast, and slow. 2) Life science, the concept introduced at PAUD Pelita Harapan, is knowing the bodies of living things, their functions, how to use body parts and life cycles, and understanding the relationship between living things and their environment. 3) Earth and space science, introduced at PAUD Pelita Harapan, recognizes objects on Earth, such as water, air, rocks, soil, and natural disasters. Meanwhile, space science is like knowing the moon, stars, sun, and influences such as weather, day and night, seasonal changes, and temperature differences. The results of learning activities are presented in Figure 1.

Figure 1. STEAM Learning Activities at PAUD Pelita Harapan

The science activities carried out are physical science activities, recognizing differences in color, shape, size, texture, weight, lightness, light, and dark, mixing colors into plant water, how to care for plants, and getting to know colors. Life science understands the environment and the functions and benefits of the environment. This learning activity develops curiosity, enjoyment, and the desire to pursue inquiry or discovery.

Second, technology. The technology concept introduced at PAUD Pelita Harapan is a simple technology they use, such as pencils, crayons, paper, spoons, plates, scissors, and containers. They should get to know the function of the technology or what they are interested in or want to know. Introduce scientific and mathematical concepts in technology, such as the influence of materials, shape, and size on the function of technology appropriately and responsibly. Technology learning activities are not only related to computers, but in early childhood learning, technology refers to using the equipment and developing children's gross or fine motor skills. The technological tools needed are mineral water glasses, food coloring, geometry, and sea sand.

Third, Engineering. Through engineering processes such as finding problems, designing, creating, and developing. The engineering process is inherent in early childhood. Several processes observed and developed by teachers at PAUD Pelita Harapan are 1) finding problems, looking for the main problem, what the causes are, and what the limitations are. 2) Generate ideas, collect ideas that arise, and discuss ideas and problems. 3) make a plan to find out what is needed, create a product design, and arrange the stages that will be carried out. 4) execute existing ideas by following plans that have been made previously. 5) Develop, if after testing the idea carried out, it has not been able to solve the problem faced or can still be optimized,

the following process. Examples of activities are playing with colors and building building blocks. Engineering is the knowledge to operate or design a procedure to solve a problem, or it could be called engineering, which is the skill possessed by someone from an early age to assemble (operate) and build something in a particular shape using various media.

Fourth art. Art plays a role in helping humans express their imagination and creativity so that there is a vast space for exploration in finding solutions to the problems they face. Forms of art that can be involved and observed at PAUD Pelita Harapan are 1) Fine art such as drawings, paintings, shapes, crafts, sculptures, or any objects created by children; 2) dance arts such as movement/dance; 3) the art of music expresses imagination and creativity through rhythmic or non-rhythmic sounds such as percussion instruments or percussion instruments from the surrounding environment, introducing vera dance, wearing the traditional clothing of single cloth, return, nggopo clothes, singing traditional songs and the Rongga language. Dramatic art expresses imagination and creativity through role-playing activities.

Fifth mathematics. Mathematical concepts such as number operations (addition, subtraction, multiplication, and division), geometric shape patterns (such as two dimensions and three dimensions), measurement concepts, and data processing concepts help observe and experiment to see scientific facts. Some mathematical concepts using local media, such as our data, which can be introduced at PAUD Pelita Harapan are as follows: 1) The concept of saying, namely the concept of recognizing number symbols and understanding the meaning of numbers such as counting the number of objects, saying numbers 1-10, ordering numbers and being able to use these numbers to convey information; 2) Number operations such as using number operations such as addition and subtraction by connecting numbers with objects such as grains, pebbles and other objects that come from the environment. 3) Comparison, namely making comparisons such as similarities/differences in shape, size, or quantity, more or less; 4) Grouping, namely carrying out a grouping process according to specific characteristics such as shape, size, color, and quantity; 5) patterns, namely number sequences, filling patterns, collages, mosaics, drawings; 6) Geometry, namely stating geometric shapes based on the shape of putting together a puzzle. Children do mathematics, such as determining quantities (numbers), sizes and colors, shapes, and recognizing patterns. Mathematical activities carried out by children include determining quantities (numbers), sizes and colors, shapes, and recognizing patterns.

The research results show that implementing local wisdom in learning at PAUD Pelita Harapan is the development of simple local wisdom. This means that the local wisdom developed is local wisdom close to children's lives or experienced by children every day. For example, the use of wua dara in counting, *wunu* teak in coloring, introduction of traditional regional clothing such as sarong sonke, ngoobe (hat), bere (bag), and regional dances such as the vera dance. This means the local wisdom developed is more about cultural values, while things related to regional superiority or regional potential have yet to be developed. The implementation of local wisdom in the learning process is developed based on existing themes and sub-themes. Implementation of learning on STEAM content made from Loose Parts at PAUD Pelita Harapan by carrying out all stages of STEAM content made from Loose Parts. Both stages in children and stages in the teacher's role. Children become very enthusiastic when exploring various components around them when learning activities with STEAM content made from Loose Parts. Children observe and study these components for themselves and then decide which components will be used and what they will be used for. In learning activities, teachers carry out the education stage by introducing play strategies and strategies for cleaning up and storing things for children. Usually, teachers guide and facilitate children in making rules before carrying out play activities. Based on the findings of researchers conducted at PAUD Pelita Harapan with the application of loose part-based STEAM learning, activities in the classroom show that the learning carried out apart from increasing children's learning concentration also uses the 10 principles of early childhood learning to directly provide children with experience of learning through play.

Apart from that, educators have implemented principles oriented towards developing character values, for example, the habit of praying before and after carrying out activities, one of the positive efforts made by PAUD Pelita Harapan to optimize psychic output with a culture of character, and can develop good character in oneself. All the children. During the observation in class B, the educator said to the children, "Come on, put on your own shoes, straighten your headscarf." It was seen that there were children who could not wear their shoes to develop life skills. Various skills are trained so that in the future, children will develop into complete human beings with noble personalities or morals, are intelligent, skilled, able to work together with other people, and able to live in society, nation, and state. Developing life skills can be trained through the learning process. This is so that children learn to help themselves, be disciplined, socialize, and acquire basic skills that are useful for their survival. A conducive environment has been created at PAUD Pelita Harapan with educational props for children both outside and inside. The location is on the side of the road, and the space is quite spacious. The classrooms used by class A and class B during learning are pretty spacious. Loose Part material, the chairs, and tables are arranged neatly. A conducive environment

is attractive, fun, safe, and comfortable for children to learn. The learning environment must be created to be exciting and fun so that children always feel at home in the school environment, indoors and outdoors.

Educators ask children to create their work using the Loose Part materials that have been provided; of course, the educator uses provocation sentences. Educators give children the opportunity to choose activities according to their interests. Democratic learning fosters a consistent attitude towards one's ideas but respects others and obeys the rules. If democratic learning is not taught from an early age, in the future, children may become selfish and not want to respect other people's opinions. Utilization of learning media, learning resources, and resource persons. Educators present natural learning resources by presenting people working as ice cream sellers. For children, this is to make learning more meaningful for them. Educators use Loose Part materials as a natural medium for children to introduce and learn them according to their needs and themes. The use of media and resources in this environment aims to make learning more contextual and meaningful, closer to children's lives.

The negative impact of implementing Loose Part-based STEAM learning in PAUD Pelita Harapan is on the number or quantity of human resources structural managers of PAUD Pelita Harapan. Human resources are still minimal, so many teachers hold multiple positions. Apart from being educators, they are also school principals, administrative employees, etc. In implementing loose part-based STEAM learning to increase children's learning concentration, educators are still lacking in the varied and collaborative application of learning methods or strategies, so student motivation and learning outcomes will decrease because students will feel bored with the same strategy patterns that .educators always use Loose Part also has disadvantages in addition to its advantages and disadvantages, namely as follows: incorrect use of strategies can result in learning boredom in children; Mistakes in using invitations and provocations can result in aspects of a child's development being hampered.

Discussion

Applying STEAM content learning using Loose Parts helps train students to analyze existing problems using various approaches, including science, technology, engineering, art, and mathematics. This learning activity is a strategy to maintain survival so that it remains able to survive in today's sophisticated era (Arce et al., 2022; Wulandani & Putri, 2022). The approach from these four aspects is a harmonious pair between problems occurring in the real world and problem-based learning (Başaran & Bay, 2022; Zayyinah et al., 2022). Learning activities are also still carried out by playing. Playing is an activity that provides satisfaction for every individual because playing is an activity that will provide pleasure. Every child cannot be separated from playing activities because playing is a necessity for children. By playing, children can learn many things without realizing it and without being burdened (Artini et al., 2016; Nuranisa et al., 2018). Through play, many benefits are given to children, such as socializing, controlling emotions, tolerance, cooperation, socialization, mental intelligence, language, and motor skills (Antara & Aryaprastya, 2013; Dewi et al., 2018). Educators have implemented the principles of learning through play through the learning plans that have been made. There are play activities, namely, children making a building using loose part materials. Children also know mathematical concepts in recognizing various shapes.

The child-centered principle is implemented well. This can be seen in how educators teach and the learning uses STEAM content made from Loose Parts. Educators choose what Loose parts materials will be used, and children determine what they will make (Nurjanah, 2020; Shabrina & Lestariningrum, 2020). Children can choose the materials they will use for their Loose parts. All children do different activities according to their respective creativity. Loose Parts are materials that can be moved, carried, combined, redesigned, taken apart, and put back together in various ways. Loose Parts creates unlimited creative possibilities in learning activities and invites children's creativity. Loose parts are teaching materials whose uses in children's learning are never-ending and can be used to explore various aspects (Nurfadillah et al., 2020; Nurjanah, 2020; Shabrina & Lestariningrum, 2020). Learning with Loose Parts teaching materials aims to ensure that children will be creative with the principle of using loose parts teaching materials; they are free to be creative in disassembling and assembling teaching materials according to their imagination. Loose part materials are often found in the environment around children. Educators have implemented the principle of active learning, which can be seen from its implementation, such as when educators create exciting activities, for example, in the picture above, namely bazaar activities where educators arouse children's curiosity and motivate children to become entrepreneurs in the theme of work. Children carry out learning activities themselves, and educators only act as facilitators (Misrawati & Suryana, 2022; Qurrata, 2020). Educators need to create a learning process that is fun and interesting and motivates children to think critically and creatively (Misrawati & Suryana, 2022; Nurfadillah et al., 2020; Nurjanah, 2020; Shabrina & Lestariningrum, 2020). Active learning means children learn based on their thoughts/ideas, not just because of the teacher's instructions.

Previous research states that the impact of implementing STEAM learning in learning activities is in the form of developing student creativity or as a means of increasing concentration, creativity, imagination, and problem-solving skills in daily activities (Başaran & Bay, 2022; Erol et al., 2022; Motimona & Maryatun, 2023). Other research also states that STEAM learning always motivates children to learn because children can learn by doing so and learn and practice (Putu et al., 2021; Wahyuningsih et al., 2020). It can be concluded that implementing Loose part-based STEAM learning at PAUD Pelita Harapan can stimulate children's development. Loose Parts have various advantages in their use: they can be used for various activities, do not run out in one use, and can be manipulated into various shapes and tools. The limitation of this research is that this research only analyzes the implementation of STEAM learning in PAUD Pelita Harapan. This research implies that the application of STEAM learning can stimulate various children's development, trigger children's brains to be more creative in using various objects around them, and stimulate children to solve problems in everyday life. Applying STEAM learning can also stimulate children to bring out various abilities, interests, and talents; it is more economical and accessible, encouraging children to discover new knowledge and experiences.

4. CONCLUSION

The implementation of STEAM learning at PAUD Pelita Harapan starts with teacher preparation in the learning process, namely designing, preparing, facilitating, and conducting evaluations. The application of loose part-based STEAM learning benefits children and teachers because it makes it easier to procure media, increases children's learning concentration and teacher creativity in designing learning activities and creating stories, and helps teachers get closer to their students. Hence, they can recognize their character, interests, and abilities. The talents of his students. Implementing loose part-based learning provides stimulation for all aspects of children's development. Implementing local wisdom in learning at PAUD Pelita Harapan is the development of simple local content values. It was concluded that Loose Part Based STEAM Learning with East Manggarai Local Wisdom can stimulate young children.

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