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The Effect of Loose Part-Based Steam Learning on Improving Fine Motor Skills in Children Aged 5-6 Years

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Abstract

In the current era, science and technology (IPTEK) is growing and developing. In facing the 21st century, humans must have 4C skills. Developing the 4C skills can be done through a learning process that contains STEAM based on Loose Parts. However, the reality is that there are still early childhood education institutions that apply classical learning, so they are considered less than optimal in providing stimulation of 4C skills for children from an early age. The purpose of this study is to provide an overview in the form of a description of the implementation of STEAM learning based on the Loose Part. For children aged 5-6 years at Pembina Wotu State Kindergarten. This study uses quantitative research. The data collection technique consists of observation, interviews, and documentation. The data validity technique uses data source triangulation and method triangulation. Data analysis techniques consist of data collection, data reduction, data presentation, and conclusion. The results of this study show that the implementation of Loose Part-based STEAM learning for children aged 5-6 years at Pembina Wotu State Kindergarten is well organized.

Keywords: STEAM learning, loose part, fine motor skills

Abstrak

Pada era saat ini semakin betumbuh berkembangnya ilmu pengetahuan dan teknologi (IPTEK). Menghadapi abad ke-21 manusia harus memiliki keterampilan 4C. Dalam mengembangkan keterampilan 4C tersebut dapat melalui sebuah pembelajaran yang di dalamnya memuat STEAM berbasis Loose Part. Namun realita yang ada masih terdapat lembaga PAUD yang menerapkan pembelajaran klasikal sehingga di nilai kurang maksimal dalam memberikan stimulasi keterampilan 4C bagi anak sejak dini. Tujuan penelitian ini adalah untuk memberikan gambaran dalam bentuk deskripsi tentang pelaksanaan pembelajaran STEAM berbasis Loose Part. Pada anak usia 5-6 tahun di TK Negeri Pembina Wotu. Penelitian ini menggunakan jenis penelitian Kuantitatif. Teknik pengumpulan data terdiri dari observasi, wawancara, dan dokumentasi. Teknik keabsahan data menggunakan

triangulasi sumber data dan triangulasi metode. Teknik analisis data terdiri dari pengumpulan data, reduksi data, penyajian data, dan kesimpulan. Hasil dari penelitian ini menunjukkan bahwa pelaksanaan pembelajaran STEAM berbasis Loose Part pada anak usia 5-6 tahun di TK Negeri Pembina Wotu terorganisir dengan baik.

Kata kunci: *Pembelajaran STEAM, loose part, motorik halus*

Introduction

Early childhood is a group of children who are in the process of growth and development. Children have growth and development patterns (fine and gross motor coordination), thinking, creativity, language and communication, which are included in intellectual intelligence (IQ), emotional intelligence (EQ), spiritual intelligence (SQ) or religious or religious intelligence (RQ), according to the child's level of growth and development. Early childhood growth and development need to be directed at laying the right foundations for the growth and development of the whole human being (Ariyanti, 2016). The early childhood learning process is a process that aims to improve child development through aspects of physical, language, cognitive, social, and artistic development (Hapidin et al., 2023).

This learning process is emphasized on learning through play, which is carried out to train children's basic skills and optimize aspects of child development (Rahma et al., 2023). Aspects of physical development in early childhood include gross motor development and fine motor development, which have an impact on the formation of children's behavior and skills to move (Sitorus, 2016). The importance of studying early childhood physical development lies in the fact that physical development, especially motor, plays an important role in the early stages of human birth. Early childhood learning that is integrated with the STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach has great significance in child development. (Rahma et al., 2023)

STEAM learning can help early childhood understand the concepts of science, technology, engineering, mathematics, and art, and apply them in everyday life (Hapidin et al., 2023). Through the STEAM approach, children will be invited to try to design objects, processes, and systems in a systematic way. This learning will also open up opportunities for children to explore the relationship between art, music, science, and others and be able to explore the potential for creativity that exists in them (Warmansyah et al., 2023). Therefore, the integration of early childhood learning with the STEAM approach can make a significant contribution to children's cognitive development, motor skills, and interests, opening the door to a future full of innovation and creativity.

Research Method

This study uses a quantitative approach with a quantitative research experimental method. Quantitative research is a process of obtaining knowledge by using data in the form of numbers as a tool for analyzing information about what you want to know. Experimental

research is the most complete quantitative research approach, in the sense that it meets all the requirements to test the cause-and-effect relationship (Syaodih, 2010). The sample in this study is vulnerable students aged 5-6 years. The data collection procedure used in this study is observing tests and documentation. The data analysis technique in this study uses descriptive statistical analysis techniques and inferential statistical data analysis techniques.

Results and Discussion

Based on the table above about children's science abilities found before and after conducting experimental activities through trial activities, it shows the number of rankings marked (+) = 66 and the number of rankings that are marked (-) = 0. In decision-making, if T counts < table T = Ho is accepted, H1 is rejected. This means that there is no influence of the guided experiment method on the ability to know cause and effect in children's science games in the age group of 5-6 years of Pembina Wotu State Kindergarten. if T calculates > T table = Ho is rejected, it means that there is an influence of the guided experiment method on the ability to know cause and effect in children's science games in the age group of 5-6 years of Kindergarten Negeri Pembina Wotu. If Z counts < Z table = Ho is accepted H1 is rejected means that there is no influence of the guided experiment method ability in knowing cause and effect in children's science games in the age group of 5-6 years old Kindergarten Negeri Pembina Wotu, if Z counts > Z table = Ho Value T : 66 50 rejected H1 is accepted means that there is an influence of the guided experiment method on science ability in knowing cause and effect in children's science games in the B1 group of Kindergarten Negeri Pembina Wotu.

Table 1. The effect of the application of experimental methods on children's science skills

It	Child Name	Children's Science Ability Values		Value Difference (O1-O2)	Ranking	Ranking Signs	
		Pretest	Posttest			+	-
1.	AGS	14	21	7	11	11	
2.	AYN	18	29	11	9,5	9,5	
3.	AYS	22	35	13	6,5	6,5	
4.	DAV	11	25	14	4,5	4,5	
5.	FIN	15	26	11	9,5	9,5	
6.	GIN	18	31	13	6,5	6,5	
7.	HAR	19	38	19	1	1	
8.	NL	12	27	15	2,5	2,5	
9.	NAR	17	29	12	8	8	
10.	NUR	26	40	14	4,5	4,5	
11.	MKL	18	33	15	2,5	2,5	
Total Value		190	334			T Value : 66	
Average Score		17,3	30,4				

The calculated T value obtained is 66 and T table 11, then the result of T calculation (66) > T table (11) H1 is accepted and Ho is rejected, meaning that there is an influence of the guided experiment method on the ability to know cause and effect in children's science games.

While the Z value of the calculation obtained is 2.93 and the Z of the table is 1,645, the result of Z calculation (2.93) > Z table (1,645) is obtained. H1 was accepted, and Ho was rejected, which means that the guided experiment method has an influence on the ability to know the cause and effect of children's science games before and after learning based on the experimental method. Based on the description above, it can be concluded that the application of the guided experiment method affects the ability to know cause and effect in children's science games.

Based on the results of the Wilcoxon test calculations, there was a significant difference between the science ability of children who participated in learning with experimental methods and groups of children who participated in learning with conventional methods. The influence of learning using the experimental method as a whole increased by 42%, which is quite high in learning because it can be used in other learning, and 58% is an influence from outside.

The results of the study based on descriptive statistical analysis showed that there was a difference in the pretest and posttest scores of children's science abilities in the experimental class and the control class, there was an influence of the guided experiment method on the ability to explore natural colors in children's science games. The difference in question is that the average score of children's science ability has increased after being given the experimental method compared to the conventional method.

This is because of the experimental method on children's science abilities that gives children the opportunity to use their five senses directly in every activity. So that children can always play an independent role in their learning process which provides real experience to children because they have been given the opportunity to conduct experiments in science activities. As stated by Trianto (2011), the purpose of applying the experimental method is so that children are able to find and find for themselves various answers or problems that they face by conducting experiments. By conducting experiments, children find evidence and truth from what they learn. In accordance with the science objectives for early childhood education, Leeper (1994) there are four things that are the goals of the development of early childhood science learning, namely (1) early childhood science learning is aimed at children having the ability to solve problems faced through the use of science methods, so that children are helped and become skilled in solving various things they face (2) so that children have a scientific attitude (3) so that children get knowledge and 52 information science that is more trusted and based on proper scientific standards (4) so that children become more interested and interested in living science that is located and found in the environment and the surrounding nature. Some of the science activities referred to here are sinking and floating rocks and twigs, coins and strophones, eggs and salt. Where in each activity the child does and observes on his own about what happens in the science experiment which provides answers to the child with the guidance and direction given by the teacher.

In the activity of sinking and floating using stones and twigs, children began to use all their five senses, from observing tools, materials, questioning about the objects they saw. He also holds and uses his sense of sight. To sink and float the object, the child conducts an experiment. It can be seen when the child lowers stones and twigs alternately on a container filled with water.

In addition, in sinking and floating activities, children use tools and materials with the guidance and supervision of the teacher, children ask and observe the tools and materials to be used. During the activity, the child began to carry out experimental activities by taking coins and seterphones and putting them in a container filled with water. When put into the container, the child observes the process of coins and seterphones floating and sinking. In this activity, children will know the cause and effect of sunken and crushed objects as well as .

Furthermore, when the child observes a glass that is given water, salt and eggs, here the child begins to understand the process of cause and effect, the child knows how to do it by putting the egg in the water and waiting for the egg to sink, float and float. The process in science experiments carried out by children will try to be understood simply by children through their five senses. In carrying out the study, children use their five senses to recognize, understand, and distinguish each process in each activity.

From the explanation of some of the science activities that have been given to children, it shows that children are directly involved in conducting experiments. Children gain new knowledge by doing hands-on experiments. Children test various objects in each experiment given by the teacher and observe the process of the experiment themselves. During the experiment activity, the child has various questions, these questions will arouse the child's curiosity so that the child will try to find the answer through the experiment carried out. The curiosity and abilities that children get can be carried over to other areas of ability and are very helpful for children to develop every potential in themselves and develop other aspects of child development. As explained by Sari (2012) said that science learning for children aims to develop students as a whole, both cognitive, and attitude, so that they are able to solve daily problems.

Meanwhile, science activities are in conventional learning. The teacher only conveys learning, by showing an image of an object that represents science learning, which shows an experimental image if the object will show the reaction that occurs, or the equation of the picture. Next, the teacher distributes the assignment sheet to the children and does it as explained by the teacher to find out the child's thinking ability in receiving learning. Teachers only use worksheets or magazines to see the abilities of their students. Teachers do not give children the opportunity to find and experiment in science activities, and they end with evaluations.

Thus, it can be seen that several things cause the difference in children's science ability scores between groups that participate in learning with guided experimental methods and learning using conventional methods, where the scores of children's science ability who participate in learning with guided experimental methods are higher than those of children who participate in conventional learning.

Conclusion

The results of the research and discussion on the research that have been carried out previously can be concluded that:

1. The description of fine motor skills of children aged 5-6 years at Pembina Wotu State Kindergarten before using Loose Part-based STEAM learning obtained the lowest score of 11, the highest score of 26, and the average score of 17.3 is said to have not developed because there are still some children in the age range of 5-6 years who are not able to get acquainted with the experimental method.
2. An overview of the abilities of 5-6 year old children at Pembina Wotu State Kindergarten after using Loose Part-based STEAM learning obtained the lowest score of 21, the highest score of 40, and the average of 30.4. The ability to know about cause and effect is said to have developed because of changes in children's abilities after the use of guided experimental methods.
3. There is a difference in the use of guided experimental methods on the concept of cause and effect for children aged 5-6 years at the State Kindergarten of Pembina Wotu. This influence can be seen from the increase in the average score of the pretest and posttest, which initially increased from a pretest score of 17 to a posttest score of 32.

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