



Plant Puzzle: How to Apply It to Increase Children's Interest in Learning Science?

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Abstract

Learning science concerning early childhood should focus on a fun learning process. However, children's interest in learning while participating in the science learning process is still low; some children are busy playing alone, disturbing their friends, doing other work, and going in and out for various reasons when science learning occurs. This study aims to increase children's interest in learning science through plant puzzle media. The research used the Classroom Action Research (CAR) with the Kemmis-Taggart model with four stages: plan, implementation, observation, and reflection. The participants are ten children aged 5-6 years at Al Faiz Early Childhood Education (ECE) Langsa, Aceh. The researcher used an observation sheet with four indicators: interest in learning, attention to learning, motivation, and knowledge to obtain improvement data. The results showed an increased children's interest in learning science in each cycle. The average score of children in the Well Developed (WD) category was 76%. In addition, children's activities also showed outstanding improvement during the teaching and learning process. The researcher concluded that plant puzzle media could increase children's interest in learning science. The implication of research related to the effectiveness of plant puzzle media on learning other than science needs to be studied further.

Kata Kunci

Minat belajar anak, sains anak usia dini, media *puzzle*, *puzzle* tanaman

Abstrak

Pembelajaran sains pada anak usia dini sebaiknya menitikberatkan pada proses pembelajaran yang menyenangkan. Namun, minat belajar anak dalam proses pembelajaran sains masih rendah; beberapa anak sibuk bermain sendiri, mengganggu temannya, mengerjakan pekerjaan lain, dan keluar masuk kelas dengan berbagai alasan saat pembelajaran sains berlangsung. Penelitian ini bertujuan untuk meningkatkan minat belajar sains anak melalui media *plant puzzle*. Penelitian ini menggunakan Penelitian Tindakan Kelas (PTK) dengan model Kemmis-Taggart dengan empat tahapan yaitu perencanaan, pelaksanaan, pengamatan, dan refleksi. Pesertanya adalah sepuluh anak usia 5-6 tahun di PAUD Al Faiz, Langsa, Aceh. Peneliti menggunakan lembar observasi dengan empat indikator yaitu minat belajar, perhatian, motivasi, dan pengetahuan untuk memperoleh data. Hasil penelitian menunjukkan adanya peningkatan minat belajar sains anak pada setiap siklusnya. Rata-rata skor anak dalam kategori berkembang sangat baik (BSB) mencapai 76%. Selain itu, aktivitas anak juga menunjukkan peningkatan yang signifikan selama proses belajar mengajar. Peneliti menyimpulkan bahwa media *plant puzzle* dapat meningkatkan minat belajar sains anak. Implikasi penelitian terkait keefektifan media *plant puzzle* pada pembelajaran selain sains perlu dikaji lebih lanjut.

A. Introduction

Learning science in early childhood is related to the phenomena that occur in the lives of children and emphasizes the process of discovering their knowledge. They find knowledge in scientific literacy that has two main competencies; lifelong learning competencies and competence in using the knowledge they have, which developments can influence science and technology (Jannah et al., 2021; Kusumaning Ayu et al., 2019). Hopefully, children will realize that the accepted explanation needs to be developed and prove the learning process. Meanwhile, learning science in early childhood has to consider and focus on a fun learning process. Fun learning and creative media involve children in the learning process (Hasanah, 2018), which relates to children's interest in learning science.

Interest is a robust motivational process that energizes learning (Renninger & Hidi, 2017). Interest is interpreted as the tendency of settled subjects to be interested in a particular field of study. Interest is also the ability to provide a stimulus that encourages someone to pay attention to activities based on experience (Sukreni et al., 2014). Interest in learning is a person's tendency to focus on learning activities, while learning is a behavior change process that occurs through mechanical stimuli and responses (Semiawan, 2002). Learning is a causal process because interacting with sources or learning objects results in changes in one's behavior. One of the learning interests that need to be increased in children is the interest in learning science.

Early scientific abilities are abilities related to various experiments or specific methods to approach logically and still consider the stages of children's thinking (Veryawan et al., 2021). Improving early childhood science skills need stimulation so that children can carry out activities as planned by the teacher. With the given stimulation, it is hoped that children will be interested and actively participate in science learning. The learning environment also significantly influences learning motivation (Damanik, 2019). The learning environment must be created as positively as possible equal to the school environment, to grow students' learning motivation. If a quality school environment is created and student learning motivation is high, it will be able to improve student learning outcomes (Hasanah, 2015).

There are so many benefits that can be obtained when children are introduced to science from an early age. Science will train children to experiment by conducting several experiments, enriching children's insight, and encouraging and directing children to be creative and full of initiative. Science accustoms children to be able to follow the stages of experimentation and must not hide a failure. Science can train positive mental, sequential (systematic). And think logically. In addition, it can also train children to be careful so that children must observe, predict, and make decisions (Gita, 2016). In exploration, children use their five senses to recognize various natural phenomena through observation activities to increase their observational abilities, such as seeing, touching, smelling, feeling, and hearing (Zaini & Dewi, 2017). Through this scientific ability, children can construct their knowledge from sensory experience, which continues with the thought process (S. U. Putri, 2019).

Learning science will be more interesting if using certain media because the media has a lot of positive impacts on children, both concerning the process of brain development and related to creativity (Hasnida, 2015). Media is everything that can be used to channel messages from the sender of the message to the recipient of the message so that it can stimulate the

thoughts, feelings, concerns and interests, and attention of early childhood so that the learning process occurs. Teaching media is divided into two parts; media in a narrow sense and media in a broad sense. In a narrow sense, teaching media only includes media that can be used effectively in a planned teaching process. In contrast, in a broad sense, media includes complex electronic communication media and includes simple tools such as slides, photography, diagrams, and charts. teacher made (Harjanto, 2006). The media used in early childhood education can be made by the teacher or purchased media. However, they must be following the themes contained in the weekly activity plan and daily activity plan.

However, there are several problems regarding the low interest in children's learning during the science learning process. This problem can be seen when learning occurs; there are still children who are not interested in participating in the learning process. There are still children who are noisy, disturbing their friends, doing other work, and going in and out for various reasons learning takes place. The media used by the teacher during learning is also still minimal. Therefore, this study aims to increase children's interest in learning science by using puzzle media. The use of puzzle media is fun and attracts children's interest in learning to improve their cognitive abilities (Sriastuti et al., 2014).

Several relevant studies using puzzles as a medium for improving children's abilities have been carried out to improve children's visual-spatial intelligence, interest in learning *hijaiyah* letters, ability to recognize geometric shapes, and ability to recognize number symbols (Asri Devi, 2020; Elan et al., 2017; A. Putri et al., 2016; Rosyanafi, 2018). In addition, research related to interest in learning has also been carried out in several ways, such as Augmented reality to support children's interest in learning science, and Ask-a Scientist site Questions (Tsabari et al., 2006; Zimmerman et al., 2016). There is also research in the form of support from both parents and teachers for children's success in learning science (Edwards & Loveridge, 2011; Halim et al., 2018; Sha et al., 2016). However, this study uses plant puzzle media which aims to increase interest in learning science in children aged 5-6 years.

B. Methodology

This research is a type of Classroom Action Research (CAR) that uses the Kemmis & Taggart model. The action was carried out in 2 cycles consisting of 4 stages: planning, action, observation, and reflection. Each cycle consists of 4 meetings. Participants in this study were ten children aged 5-6 years at Al Faiz Early Childhood Education (ECE) Langsa, Aceh Province.

The instrument used in this study is an observation sheet with four indicators; interest in learning, attention to learning, motivation, and knowledge. Data collection through observation was carried out by researchers and collaborated with classroom teachers. The steps taken during the study are described as follows:

1. Planning

At the planning stage, the researcher and the teacher made a Daily Activity Plan using plant puzzle game media, prepared learning tools, and then continued to prepare non-test instruments. The instrument is an observation guide sheet to observe children's activities and teacher performance in the learning process. And interview sheets.

2. Implementation

This stage is the implementation of a predetermined plan. In the cycle, the teacher's initial activity is to understand the characteristics of children and how to increase children's interest in learning through Plant Puzzle Media. The teacher invites children to do activities together in compiling a plant puzzle according to the picture of the plant. The teacher puts the puzzle of plants that have been randomized and then asks the children to follow the shape that matches the picture of the plant.

3. Observation

The researcher acts as a working partner who assesses children's learning activities at the observation stage. Researchers recorded all activities carried out by children during learning, starting from the initial activity to the last activity. Observations of learning activities are carried out at the time of implementation to determine the course of the learning process.

4. Reflection

In the reflection stage, the researcher analyzed the results of observations and assessed their successes and failures. If the data obtained in the first cycle of the teaching and learning process have not reached the success criteria, then the action will be continued to the second cycle. The researcher also details the obstacles faced in the field and fixes them to determine the appropriate action in cycle two to achieve the desired goals.

The data analysis technique used is quantitative and qualitative data analysis. Quantitative data was obtained from the percentage increase in children's interest in learning science, while qualitative data was in science learning activities using plant puzzle media which included data reduction, data presentation, and concluding. The data analysis technique was carried out to determine the increase in children's learning interest through the plant puzzles media and compare the results achieved in each cycle. The criteria for the success rate of the learning process are determined as follows in table 1:

Table 1. Category of Student Success

Percentage	Categories
0%-25%	Undeveloped (UD)
26%-50%	Start Developing (SD)
51%-75%	In Expected Developing (ED)
76%-100%	Well Developed (WD)

C. Result and Discussion

1. Results

a. Pre Cycle

To find out the initial score of children's interest in learning, researchers made observations of children when teaching and learning activities took place. The results of observations obtained on learning and playing activities at Al Faiz ECE are as follows:

- 1) Children's interest in learning during learning activities in class is lacking, this is due to learning activities filled with drawing activities, and sometimes children feel bored.

- 2) Children at school get bored more quickly with learning and playing with media they often use.
- 3) When the teacher explains the subject matter, some often talk or argue, are busy playing with their writing instruments, and play with their classmates. Some children go in and out for various reasons while learning, drawing, and doing other work instead of school—the time.

The researchers used fruit plant puzzle media as a learning medium to overcome this because the puzzle has not been used at Al Faiz. With the new learning media, it is hoped to increase interest in learning science.

b. Cycle I

1) Planning

Planning begins with preparing materials and preparing fruit plant puzzle media. The researcher designs all the puzzles given in science learning activities. The learning method used is a demonstration method, where children are given an example of how to play with a fruit plant puzzle. In the first cycle, children are given one fruit plant puzzle for one child. It is hoped that children will be motivated to take part in learning with pleasure and enthusiasm. As a technical description, observations will be made in recordings of learning activities through field notes, photo cameras, and observation sheets to reflect the overall observations.

2) Action

The implementation of the actions in the first few meetings of the cycle includes explaining the learning carried out and introducing fruit plant puzzles to children. The teacher guides the children in the learning and playing process and identifies an increased interest in learning science. The children arrange the fruit puzzles that have been provided. The puzzle consists of 4 kinds of fruit, avocado, apple, orange, and papaya.

3) Observation

At the beginning of learning and playing activities, learning is done while playing by using puzzles in the form of fruit plants. Hearing this explanation, the children were noisy. They fought because they were curious about the shape of the fruit plant puzzle, so the researchers were overwhelmed in introducing the fruit plant puzzle and explaining the game's rules. After being helped by the teacher to calm the child, the researcher said that learning would be done individually, each child getting a puzzle which would later be described and reassembled. If someone has finished, they can help their friends who have trouble. Next, the teacher asks questions related to the learning that will take place to provoke children's interest in learning. After the delivery of the learning is deemed sufficient, the child can choose the color of the fruit plant puzzle as desired.

After each child holds the puzzle and is sitting comfortably, the child is guided on how to use the fruit plant puzzle. First, the fruit plant puzzle is removed by pushing it with the thumb then the other puzzle pieces can be unraveled. After that, the child must install the puzzle according to the initial shape. The majority of children have difficulty pushing and putting the puzzle back together. Some children did not want to put the puzzle back together for complicated reasons even though the teacher and friends had helped them. Assessment is

carried out when the learning process takes place. At the end of the lesson, the children were asked about the lesson they had just done, and some children grumbled because they could not put the puzzle together correctly. Some children said the fruit plant puzzle was challenging to put together.

The observations of increasing children's interest in science learning using plant puzzle media carried out in cycle I showed children were still in the UD, SD, and ED categories. It can be seen through the recapitulation of each meeting in table 2.

Tabel 2. Data of Interest in Learning Cycle I

Indicator	Meeting I			Meeting II			Meeting III			Meeting IV			\bar{X} cycle I		
	UD	SD	ED	UD	SD	ED	UD	SD	ED	UD	SD	ED	UD	SD	ED
Interest in Learning	80	20	-	60	40	-	50	30	20	50	30	20	65	35	15
Attention to Learning	70	30	-	70	30	-	70	30	-	70	30	-	75	35	-
Motivation	80	20	-	70	10	20	60	30	10	60	30	10	68	25	10
Knowledge	60	40	-	50	40	10	40	50	10	40	50	10	48	45	8
Total	73	28	-	63	30	8	55	35	10	55	35	10	62	32	7

The scores and percentages obtained from each indicator show that interest in learning science in the first cycle is still below the expected percentage value of 42%. This research is said to be successful if children's interest in learning science has increased by 80% of the total number of children in Al-Faiz ECE.

4) Reflection

Reflection is reviewing the results of observations and problems encountered during the action in the first cycle. From the learning results from the first cycle, several problems were found as follows: (1) Children's interest in learning is still low. It can be seen that some children are not active and not enthusiastic about learning because the fruit plant puzzle is still a new medium for them. (2) Many children still play around with puzzles without putting them back together. Children consider puzzles challenging to rearrange, so children easily give up. (3) Because one fruit plant puzzle consists of several pieces, children still find it challenging to coordinate the arrangement of the puzzle so that many puzzle pieces are mixed up. (4) Many children still have difficulty putting together the fruit plant puzzle. (5) Class management is not optimal, so many children play around by rolling fruit plant puzzles.

Based on the reflection on the shortcomings faced in the first cycle, the research continued to the second cycle with the same material. The reflection results made improvements: (1) Teachers are more intensive in guiding children so that children do not easily give up on compiling fruit puzzles. (2) The teacher motivates children more during the learning process. (3) In addition to the learning process, children are also allowed to arrange puzzles during breaks to be more familiar with fruit plant puzzles. (4) The teacher is more active in managing the class so that all children can learn to arrange fruit plant puzzles correctly.

Although children's interest in learning is still low in the first cycle, the positive thing that can be taken from this first cycle is that children are willing to try to follow the learning process. Some children are interested in playing with puzzles during the learning process and

recess. Children who can achieve the ED and WD criteria support the increasing value of children's learning outcomes.

c. Cycle II

Cycle II is a follow-up to cycle I. As in cycle I, Cycle II is also carried out based on research procedures, namely planning, implementation (action), observation (observation), and reflection. Based on the results of observations about the increase in children's interest in learning science in cycle II, it is known that there is a significant increase in children's interest in learning science, as shown in Table 3.

Table 3. Cycle II Learning Outcomes Data

Indicator	Meeting I		Meeting II		Meeting III		Meeting IV		X̄ cycle II	
	UD	SD	ED	UD	SD	ED	UD	SD	ED	UD
Interest in Learning	40	60	30	70	20	80	10	90	30	75
Attention to Learning	50	50	30	70	20	80	10	90	30	74
Motivation	40	60	30	70	20	80	10	90	35	76
Knowledge	50	50	40	60	30	70	20	80	45	70
Total	45	59	35	72	25	78	15	88	33	76

The study was stopped in cycle II because children's interest in learning science has reached a success indicator of 76% very Well Developed (WD). Therefore, it can be concluded that research on increasing children's interest in science learning through plant puzzle media at Al Faiz ECE has been successful.

2. Discussion

The initial condition of children's interest in learning in Al Faiz ECE obtained by researchers through observation shows that children's interest in learning science is still lacking. Children find it difficult to recognize and distinguish different kinds of fruit plants; children are less active during science learning activities and get bored more quickly. When a teacher is explaining the learning material, there are still children who are not interested in learning, disturb their friends, are busy playing or do other work that is not on time. Some are often in and out for various reasons while learning takes place. It happens because of teachers' lack of attractive science learning media. The failure of science learning is due to no connection in everyday life, not using creative learning media, and only focusing on memory (Jannah et al., 2021). Therefore, researchers took action by using plant puzzle media to increase children's interest in learning science.

Puzzle media can train children's thinking skills to develop their knowledge and hands-on skills in disassembling and reassembling puzzle pieces. Puzzle media is an exciting learning activity for children because children like attractive shapes and colors (Sriastuti et al., 2014). With plant puzzle media, children will try to solve the problem; by disassembling and rearranging the pieces of fruit pictures in the puzzle into a complete form. By utilizing puzzle media in learning activities, children can train concentration, accuracy, patience, and hand and eye coordination. Matching puzzle pieces and arranging them into one picture can strengthen memory, introduce children to the concept of relationships by choosing pictures/shapes, train children to think mathematically (using the left brain), and train children's logic. For example, children are trained to conclude how to separate the shape of a plant puzzle according to logic.

The use of puzzle media is fun and attracts children's interest in learning to improve their cognitive abilities (Sriastuti et al., 2014). Hence, plant puzzle media is a learning medium that suits children's needs.

Interest in learning is a person's tendency and focus on learning activities. Interest can be seen from the awareness that arises towards particular objects that are very liked and give birth to great attention for individuals. So interest in learning is an aspect of a person's psychology that manifests itself in several symptoms, such as; passion, desire, and feeling like to carry out changing behavior through various activities that include seeking knowledge and experience. In other words, interest in learning is attention, liking, and interest in someone (children) towards learning which is shown through enthusiasm, participation, and activeness in learning (Nurhasanah & Sobandi, 2016). The intended interest in this research is the children's willingness to take an active role in learning science.

Science learning using plant puzzle media can increase children's interest in learning the science learning process. Science learning is a child's activity carried out by exploring various objects around it. In exploration, children use their five senses to recognize various natural phenomena through observation (sensing) activities to increase their observational abilities, such as seeing, touching, smelling, feeling, and hearing. Scientific literacy has two main competencies. First, lifelong learning competencies (lifelong education), and second, competence in using their knowledge, which developments can influence science and technology (Jannah et al., 2021). Through this scientific ability, children can construct their knowledge from sensory experience, which continues with the thought process (S. U. Putri, 2019). Therefore, science needs to be introduced from an early age during the stages of child development with fun learning activities and educational and educative learning media.

The results of children's interest in learning in this study were analyzed through the observation sheet of interest in learning. The observation sheet for children's learning interests is used when the teacher demonstrates how to use plant puzzle media. Based on observations of children's learning interest by the teacher in using plant puzzle media in cycle I and cycle II, the children became interested when the researcher gave instructions to sit in a circle. After that, the teacher started learning by introducing posters with pictures of fruit plants and showing some videos about fruits. However, video in this scenario is a series of non-core activities. There is no significant difference in the level of knowledge before and after being given education using video (E. B. P. Putri & Noviani, 2021). In addition, the children have also started to listen and pay attention when the teacher explains the lesson. It is shown that the children also do not play alone and talk alone when the teacher is explaining, although there are still one/or two children whose attention is still not focused. The children also listened when the teacher mentioned various fruit plants, the names of fruit plants, the color of fruit plants and their parts, mentioned the names of fruit plants in Indonesian and English, and introduced processed foods and drinks from fruit plants. Learning activities that are designed according to their characteristics will be much fun (Fitri, 2020) and the implementation of ice-breaking activities can increase the learning interest (Lestari et al., 2021).

Moreover, vitamin content and the benefits of fruit plants and children also listen and pay attention when the teacher tells and demonstrates how to grow fruit plants. The children were enthusiastic about repeating what the teacher had told them about fruit plants. Interest in

learning science developed since preschool can prepare children to learn science in the upper elementary grades and sustain an enduring interest in learning about science (Anderson & Helms, 2001; Rennie et al., 2003).

Before putting together a plant puzzle, the teacher explained the game to the children, and the children listened to the teacher's directions. After the children finished putting together the fruit plant puzzle, the teacher asked each child to name the plant puzzle he had made, and the child was happy when the teacher gave praise. Applying puzzles in the teaching may increase the motivation, enhance the mastering apprehension, promote the creative processes, expand the ability to engage and solve various challenges from various viewpoints, and lead to an improved learning process and problem-solving capability (Jelle, 2017). Children were enthusiastic when the fruit plant puzzle was distributed. There was a bit of a commotion because several children were fighting over the puzzle.

D. Conclusion and Recommendation

Using plant puzzle media can increase children's interest in learning science. Besides that, children's attention to following the science learning process improves. Children's activities showed outstanding improvement during the teaching and learning process. In addition, motivation in learning science is also increasing; they explore various objects around it. This effect significantly increases knowledge of science in early childhood. This research can be considered for pre-school and early childhood teachers to provide plant puzzle media in the science learning process. This research is expected to be an input to maximize children's interest in any learning. Further research related to the effectiveness of plant puzzle media on learning other than science is to be studied further.


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