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APPLICATION OF BASIC SCIENCE TO DEVELOP COGNITIVE CHILDREN AGE 5-6 YEARS AT AL-IKHSAN BORE KINDERGARTEN IN 2023

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Abstract:
This research aims to find out how basic science is applied to develop the cognitive development of children aged 5-6 years at Al-Ikhsan Bore Kindergarten in 2023. The type of research used is qualitative research with subjects of 11 boys and 9 girls aged 5-6 year. To obtain data in this research using observation, interviews and documentation methods. The data analysis technique used is descriptive qualitative. In this research, there are steps in its implementation, namely: First, preparation for preparing tools and materials during the grain planting activity, making children's learning results sheets and preparing students to take part in the activity. Second, an opener to open children's horizons. Third, the activity was carried out for six days with the activity of observing plant growth and comparing plant growth and fourth, namely closing, to ask again about the lessons that had been learned and carried out. The results of the research in the application of basic science to develop cognitively, namely by using 13 indicators that have been observed, namely that there are 5 children in the basic to develop (MB) category, 9 children are categorized as developing according to expectations (BSH) and 5 children are developing very well (BSB). Based on the results of this research, it can be concluded that the activity of planting grain which is carried out correctly and systematically can develop children's cognitive abilities

Keywords: *Cognitive, Early Childhood, Basic Science*

INTRODUCTION

Basically the learning process in early childhood education is based on learning, playing and singing (Cendana & Suryana, 2022). Therefore, educators need to create a learning atmosphere that can make children happy and free to express themselves so that children will become more enthusiastic in learning. Science learning in early childhood provides benefits for improving children's cognitive abilities, one of which is children's ability to understand scientific concepts in relation to everyday life, having process skills and learning activities aimed at developing children's knowledge about the natural

environment and being able to apply them. methods and have a scientific attitude to solve the problems they face (Rahmi, 2020).

Early childhood education is the most basic education for children's growth and development. At an early age, children grow and develop very rapidly, especially in the process of forming the basics of children's potential and intelligence. The development of a child's basic potential reaches 80% at an early age, while the rest occurs until the child reaches late adolescence or at the age of 17/18 years (Fahruddin & Astini, 2018).

This condition needs serious attention if the growth of a golden generation or quality generation is desired in the future. The quality of human resources is largely determined by the stimulation that children receive during their growth and development at an early age. Stimulation is provided to develop children's basic potential so that their development is optimal (Rismayanthi, 2013).One aspect of development in early childhood is the cognitive aspect. Cognition is a thinking activity and is the center of control carried out by humans, namely the ability to integrate, assess and consider an event or event. Cognitive development refers to a child's development in thinking and the ability to give reasons, changes in thinking, intelligence and language in children (Sujiono et al., 2013).

A form of education for early childhood that can support their cognitive development is basic science learning. Basic science learning in early childhood is an ability related to experiments or demonstrations as a scientific approach. The essence of science learning in early childhood is learning activities that create an interesting and enjoyable atmosphere through security, investigation and experimentation to find out everything in the child's environment (Khadijah, 2016).

Basic science learning has a general goal, namely being able to actively seek information about the environment around children, while the specific goal is that children have the ability to observe changes that occur, carry out simple experiments, compare, classify, estimate, communicate, and build children's creativity and innovation. Interest teaches learning science to children because it is easy to give to children, the media and learning resources come from the environment around the child so that children can explore, observe and communicate. The application of science provides direct experience for children to experience for themselves, search for the truth and draw conclusions from the processes they experience so that children's thinking power is honed (Khaeriyah et al., 2018).

In initial observations through interviews, researchers with educators at Al-Ikhsan Bore Kindergarten. Researchers found problems in implementing monotonous learning activities, such as using the method of giving assignments and asking questions. With the implementation of these learning activities, children were still less active and made children feel bored when participating in the learning process. and limited use of Educational Props

(APE).The cognitive development of students at Al-Ikhsan Bore Kindergarten for children aged 5-6 years has been well stimulated, but there are still some students who have delays in their cognitive development, such as being unable to explain the growth process of a plant due to the child's lack of experience in real environmental knowledge.

Learning that is suitable for young children is playing while learning or learning while playing, through this activity children will be invited to explore, discover new things (experimentation) (Zaini, 2015). The application of science to early childhood through experiments, in this case it is not a complicated process but children can understand the concept or process of something happening, for example: about the process of changing the growth of a plant. Activities that can be carried out to develop children's cognitive abilities in applying basic science are through planting grains. The reason for using grains to carry out activities in applying science is because they are easy to find and the growth change process is easy to observe.

RESEARCH METHODS

This research uses a type of qualitative descriptive research with a data collection method through observation, namely data collection carried out by observation accompanied by recording the condition or behavior of the target object. Observation is systematically observing and recording the symptoms being studied. The research was carried out at Al-Ikhsan Bore Kindergarten with research subjects using children aged 5-6 years, 11 boys and 8 girls. In this research, the data collection methods used were interviews, observation and documentation. The interview was conducted with one of the educators. The type of interview used is semi*structure interview* . In the direct observation activity, the researcher is a direct observer who observes and understands children's cognitive development during the process of initial science application activities. The researcher is assisted by the teacher in observing children's cognitive development in the use of initial application science through the activity of planting grain. The documents needed in this research are in the form of pictures during learning activities. The research procedures carried out were preparation, opening, implementation (core activities) and closing. The research period is 6 days starting from 21 August - 26 August 2023 with 6 different meetings and activities. The data analysis technique uses qualitative descriptive. Data analysis is carried out using the steps of organizing data, describing it, synesthesizing, compiling patterns, selecting the data to be presented (Sugiyono, 2017). Data analysis was carried out in this research by calculating the values obtained during the research using the following formula (Firdaus, et.al., 2022):

$$\text{Score} = \frac{Attained\ Score}{Maximum\ Score}\ x\ 100$$

To determine the level of children's cognitive development in the application of basic science, researchers created assessment standards that make it easier for researchers to categorize children's cognitive development.

Table 1. Categories of Clidren's Cognitive Development

No	Score	Categories
1.	86-100	BSB
2.	71-85	BSH
3.	56-70	MB
4.	41-55	BB

RESULTS AND DISCUSSION

Basic Science Applications

In the application of elementary science there are steps as follows:

1. Planning

   This stage contains activities such as preparing a daily learning implementation plan (RPPH), preparing the materials needed to apply initial science, observing the child's level of development, making a child's learning results sheet.

2. Implementation

   In its implementation, the meeting was held for six days starting on August 21-August 26 2023 at 08.30-10.15 WITA with the theme of plants. In its implementation there are several stages, namely:

   a) Initial activity

      At this stage, activities have the function of opening children's insight regarding the themes/topics discussed, such as names of grains, colors, processed foods made from grains and parts of grain plants. Introduction to the tools used and establishing agreement on the rules of the game during the activity. Prepare children to take part in activities.

   b) Core Activities/Implementation

      At this stage, the activities used during the research include several play activities, including:

      1) Meeting I, activities to group, compare and sort grains based on color, size and quantity. The second activity is a collage using grains.

2) Meeting II, at this meeting the activities carried out were witnessing how to plant grain and the practice of planting grain.
3) Meeting III, observing the changes that occur in the grain and attaching pictures of the grain growth process.
4) Meeting IV, observing grain crops. In addition, the activities carried out are also labeling the growing parts of plants.
5) Meeting V, observing and measuring the height of the plants and sequencing the processes and steps of plant growth from seeds to plants.
6) Meeting VI, activities to observe and measure plants and then compare grain growth.

c) Final/closing activities

This activity functions as an activity to confirm children's knowledge gained during the activity and as a session to provide motivation as well as provide appreciation for children who still need guidance during the activity.

Development of Logical Thinking

The application of early childhood science to develop the cognitive abilities of children aged 5-6 years at Kindergarten B2 Al-Ikhsan Bore was seen from 13 indicators of children's logical thinking abilities that researchers observed. The following is a table of indicators of children's achievements in the application of early science to develop children's cognitive development, namely:

Table 2. Results Of Cognitive Development Observation

Indicator	Category				Quantity
	BB	MB	BSH	BSB	
1		2	9	8	19
2		5	8	6	19
3		3	8	8	19
4			10	9	19
5			10	9	19
6			11	8	19
7		3	10	6	19
8			3	16	19
9		10	9		19
10		6	8	5	19
11		3	9	7	19

12	8	7	4	19
13	11	7	1	19

Based on the results of research through observation, researchers found that learning activities with the application of initial science were taking place. Of the 19 children studied, 13 indicators were used to determine children's cognitive development, namely, in indicator 1, being able to compare objects based on their size (larger-smaller). 2 children were in the basic to develop (MB) category, 9 children were developing according to expectations and 8 children were in the category developing very well (BSB). In indicator 2, sorting objects from largest to smallest, 5 children are starting to develop (MB), 8 children are developing according to expectations and 6 children are developing very well. Next, indicator 3, compares objects based on their number (many-few), 3 children are starting to develop (MB), 8 children are developing according to expectations (BSH) and 6 children are in the very well developing category (BSB). Indicator 4, mentions the names of colors, 10 children are in the developing according to expectations (BSH) category and 9 children are in the very well developing (BSB) category. Indicator 5, grouping objects based on color, there are 10 children in the category developing according to expectations (BSH) and 9 children developing very well (BSB). Indicators of grouping objects based on their size, 11 children developed according to expectations (BSH) and 8 children developed very well (BSB). Indicator 6, using a ruler to measure the height of grain plants, there are 3 children in the starting to develop (MB) category, 10 children developing as expected (BSH) and 6 children in the very well developing (BSB) category. Indicator 7, understanding the benefits of water for plant growth, 2 children developed according to expectations (BSH) and 17 children developed very well. Indicator 8, understanding the benefits of sunlight for plant growth, 10 children are in the developing according to expectations (BSH) category and 9 children are in the very well developing (BSB) category. Indicator 9, tells the difference in the growth of plants exposed to sunlight and plants not exposed to sunlight, 6 children are starting to develop (MB), 8 children are developing as expected (BSH) and 5 children are developing very well (BSB). Indicator 10, knowing the names of the parts of plants, there are 3 children in the starting to develop (MB) category, 9 children in the developing according to expectations (BSH) category and 7 children in the very well developing (BSB) category. Indicator 11, tells about the process of plant growth, 8 children are starting to develop (MB), 7 children are developing according to expectations (BSH) and 4 children are in the very well developing category. Indicator 11, tells about the development process that occurs in plants, there are 11 children in the starting to develop category, 7 children in the developing according to expectations (BSH) category and 1 child in the very well developing category (BSB).

Table 3. Cognitive Development Scores Of Chlidren Aged 5-6 Years After Application Of Basic Science

No	Code	Scores	Category
1.	HAA	63,4	MB
2	EJ	65,3	MB
3	MA	65,3	MB
4	GSA	68,2	MB
5	MAH	69,2	MB
6	AM	71,1	BSH
7	AFM	73	BSH
8	RSR	73	BSH
9	TDA	73	BSH
10	AA	76,9	BSH
11	F	78,8	BSH
12	NSA	80,7	BSH
13	DA	82,6	BSH
14	AN	82,6	BSH
15	AT	88,4	BSB
16	AG	92,3	BSB
17	ZAW	92,3	BSB
18	ZA	94,2	BSB
19	AZ	96,1	BSB

In the research results above, there are scores obtained by each child to determine the cognitive development of children aged 5-6 years after the application of initial science, namely there are 5 children in the starting to develop (MB) category, 9 children in the developing according to expectations (BSH) category and 5 children in the very well developed (BSB) category.

Process of Applying Basic Science through Grain Planting Activities at Al-Ikhsan Bore Kindergarten

Basic science can train children in experimenting by carrying out several experiments, enriching children's insight to always try and try. So that science can direct and encourage children to become creative and initiative people (Musi et al., 2022). Science teaches children to become children who follow the stages of experimentation and do not hide failures. This means that science can train positive mental thinking, logical and sequential

(systematic) thinking. Science in early childhood emphasizes processes rather than products, so the application of science should be done simply and while playing (Amalia & Suprapti, 2018). In carrying out grain planting activities, the processes carried out by students are observation, research process, grouping, prediction, finding evidence and acquiring knowledge.

By using the activity of planting grains in the application of early science in early childhood, it can give students the opportunity to know an event, see the cause and effect directly and can make students understand the differences (size, color, number and shape) of the activity. planting grain, students are able to explore actively. Science in early childhood can be defined as things that stimulate students to increase curiosity, interest and problem solving, giving rise to thoughts and actions such as observing, thinking and linking concepts or events (Syarifah, 2017).

Media for Grain Planting Activities

In the process of activities to improve children's cognitive abilities, several stages have been carried out, such as determining developmental achievements during grain planting activities. It is important to determine developmental achievements which will make it easier for students to build concepts about objects and events in a scientific process through the activity of planting seeds to develop children's cognitive abilities. After determining the developmental achievements, the researcher then invited the students to discuss the procedures, tools and materials used, as well as guiding the children during the activity of planting grain.

Interesting media will make students curious about the activity of planting grain. The use of tools and materials should be recognized by students, which are easy to find and do not harm students, such as soil, water, plastic cups, rulers, learning videos and seeds. The choice of tools and materials should be flexible and can be used anywhere or can be found around students (Krassadaki et al., 2014).Using media that attracts children's attention will foster motivation in them (Febrita & Ulfah, 2019). In line with the results of researchers' observations, if the tools and materials used are interesting, they can increase motivation in participating in grain planting activities. In this research, the researcher did not merely prepare interesting media or materials for the activity of planting grain, but the researcher provided opportunities for students to carry out activities related to planting grain, apart from that, the researcher provided guidance in carrying out activities based on their individual abilities. different students. One real form of seeing children's differences is by examining children's achievement results, because children's achievement levels vary according to the child's abilities (Hansen, 2016).

Results of Process Evaluation of Grain Planting Activities in Basic Science

The results of the evaluation from researchers are given to students in view of the process of student participation in initial science using the activity of planting grain from the observation process to the discovery of the results obtained from the process. Apart from that, researchers evaluate students by inviting students to recall what they have done that day (recalling).

Students are invited to tell how the day's activities started and how to carry out the activities that day so that they get good results in the process of planting grain for initial science. The purpose of recalling is to provide activity evaluation and reinforcement of children's cognitive development. In this grain planting activity, researchers provide an assessment of children's cognitive development with the results of carrying out the grain planting process activity. This assessment is based on predetermined objectives and indicators which are assessed as outlined in the student observation sheet.

CONCLUSION

After carrying out a series of research and analyzing the data that has been collected in the field, the next stage is drawing conclusions. Based on the results of research in the application of early science to develop cognitive using the activity of planting grain through several stages, namely 1). Preparation, the researcher prepares the place, media, tools and materials needed during the activity. 2). In opening, the researcher opened the children's insight, knowledge and opinions about grain plants. 3). Implementation, the research was carried out over six days using different activities, such as observing, grouping, measuring, comparing and communicating about the development of grain crops. 4.) Closing, at this stage the researcher and the children will discuss the activities that have been carried out again.

The instruments used are 13 indicators used to observe children's cognitive development. The results of the research using these 13 indicators were foundThere are 5 children in the starting to develop (MB) category, 9 children in the developing according to expectations (BSH) category and 5 children in the very well developing (BSB) category.

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