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## **Improving Science Skills Through The Experiment Method Of Making Toge From Green Beans In Group B Children (In The Smart Paud Unit, Suka Bulan Village, Seluma Regency)**

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**Abstract.** The purpose of this study was to determine whether through the experimental method of making bean sprouts from mung beans can improve science skills in group B children at the Smart PAUD Unit in Suka Bulan Village, Seluma Regency. This type of research is PTK which is focused on the classroom situation and the procedures used are cyclical. The subjects in this study were group B children totaling 15 children. This classroom action research uses the John Elliot model where each cycle consists of four activities, namely planning, implementation, observation, and reflection carried out through two cycles. Data collection techniques used observation and documentation methods. Data analysis was carried out descriptively qualitative-quantitative with the emphasis used to determine the improvement of the process expressed in a predicate, while quantitative data analysis was used to determine the improvement of results using percentages. The results of improving science skills through the experimental method of making green beans in group B children in cycle I were 72% and in cycle II an increase of 89% was found. The conclusion of the research is that through the experimental method of making green beans can improve science skills in group B children at PAUD Smart Suka Bulan Village, Seluma Regency. Evidently in cycle II there was an increase, the percentage of achievement was 89% with very good developing criteria (BSB).

**Keywords:** *Science skills, experimental method of making tofu from mung beans.*

### **INTRODUCTION**

Children's education age early believed as step First education integrated basis on the system education national . Children's education age early provide learning For stimulate various aspect development children , social , emotional , physical , cognitive , and language . Children's education age early is age effective child For develop various potential and skills possessed child . One of steps and strategies for give optimal provision for children is preceded with understand characteristics and objectives education and learning that will applied to child age early , namely with notice development ability science in children age early ( Luthfiah , 2018). Science is one of the development important and must given stimulation as early as maybe in children For introduce draft science early in children . Therefore that , in increase ability science in children age early can done with introduce the right activity For stimulate development ability science children . According to Putra (2013) learning science is learning that emphasizes to the disbursement process knowledge rather than knowledge transfer . The child is looked at as subject learning what is needed involved in a way active in the learning process , while the teacher is only a facilitator who guides as well as coordinate activity Study child . Ability science is ability or skills possessed by children For learn as well as control environment natural around child acquired through the process of knowing , doing experiment , explore or experiment and observe (Laily, 2023). Introduction about science should done since age early

with fun activities and through habituation for children experiencing the process of science in a way directly . That thing done so that the child No only know the result just but also can understand the process of activity the science he does . Science allows child do exploration to various thing , good object life and also dead . In addition, it can also practice child use five his senses For know various symptom objects and events Suyanto ( in Syafril , 2023 ). For support for this process to occur , teachers need to method proper learning For child educate . Children aged early need methods that can make they interact direct with activities carried out . In terms of this teacher can use method experiment . Chairul ( in Syafril , 2023 ) method experiment is method giving chance to child participant educate individual or group , for trained do a process or experiment . Learning science can given to children through method play because of the world of children is play so learning can done through activity play while Study or Study while play . play is a activities carried out with or without use tool that produces understanding or give information , giving pleasure and also develop imagination in children . Through play child invited For explore , discover and exploit nearby objects with him , so that learning become more meaningful . Apart from that , study with play give chance to child For manipulate , repeat , find yourself , practice and get many kinds of draft as well as meaning that is not counted many . Children aged early need a method learning that can involving child in a way direct in activity learning or jump direct into the activities , so that knowledge knowledge given easy accepted by children and children can interact in a way direct with environment . Observation results Researcher find A problem that is ability science child Still not optimal, things This proven when the teacher asks like What plant kale , how the ingredients , child Still Confused For answer it . Problem This appear Because during this is a learning process science is still carried out by teachers nature monotonous , learning science only listening to the teacher telling a story or method lectures and provision of LKA in the form of magazine , teacher not yet Once give opportunities for children For do experiment in a way direct to child like do experiment , proof , see in a way direct What is learned that can seen in a way real in the environment . The methods used by teachers are still not enough appropriate in learning science , then chance child in explore in the world of science become not enough maximum . Of course . matter the cause child No can develop his ability in know natural surrounding and things it can also be hinder wish know children only imagine and visualize just the trial process that the teacher tells . Learning science more mostly dominated by educators with give example test without involving child in activities , things This make child difficult explore with the media around you child . Giving learning science This peting for child age early use practice child so that can think logical namely the process of thinking child in solve ongoing problems faced and can practice independence child .

## LITERATURE REVIEW

### Definition of Science

Science originates from Language English "*science*" which means knowledge knowledge . science Alone originate from word of language Latin " *scientia* " which means I know . *Science* consists of from two branches knowledge that is *social science* ( science) knowledge social ) and *natural science* ( science) knowledge nature ). However in its development *science* often translated as meaningful science knowledge knowledge nature ( Ainiyah , 2021). Ability science is ability or skills possessed by children For learn as well as control environment natural around child acquired through the process of knowing , doing experiment , explore or experiments and observing . Science is the science that studies about nature , which is related with environment around and self alone . Learning science is learning that involves children and the environment in a way directly ( Laily , 2023). ability science child age early is skill or skills possessed by a person child For process results which he obtained after do activity observe, classify, predict,

create interpret, implement, do planning and final to communicate results obtained from series activity ( Pujiarto , 2022). Science is A close study the relationship with condition real ( fact ) or the truth is composed in a way systematic and shows operation law of a nature general . Science is also interpreted as method For try find essence all something , attitude , and skills that can allow a individual For solve ongoing problem they face it in life everyday ( Yaswinda , 2019 ). Science is as knowledge theory based on on observations , experiments to symptom natural in the form of macrocosm meaning natural universe and microcosm which means Contents from natural the finite universe , in particular about humans and their characteristics (Dewi, 2017). Science is a process of thinking For to obtain knowledge that includes understanding problem , knowledge about because consequences , proposing ideas and explanations , seeking know through experiments and observations , as well as share results research and experiments ( Salsabilah , 2023). Science is structured knowledge in a way regular , applicable general and in the form of gathering results observation and experiment ( Sari, 2021 ). According to Abruzzo look at that science as knowledge gained through a regular process For disclose something related with nature . In addition , Carin and Sound stated that science is structured knowledge in a way regular ( Putri, 2019 ). Science is gathering from interrelated concepts and frameworks related , which appears as results from experiments and observations that can observed and practiced . Science This close the relation with incident nature and conditions real environment natural children ( Refianti , 2022). Based on expert opinion above , can

### **Characteristics Science Skills in Early Childhood**

Ability science is the ability used For acquire and study various information about phenomenon nature . Through ability science child Can learn about science like observation , classifying , conducting experiments and so on . Alih Nugraha ( in Chasanah , 2023) groups ability science among others as following :

1. Observe , Observe involving combination from a number of or all over tool senses . In it there is activity see , smell , hear , taste , and touch . Things that can observed can in the form of picture or the things given to child at the time That tested Then child requested For write results his observations time That .
2. Classify / categorize Classify or classify is something that is used For arrange objects to in a row group certain . Its activities among others , namely look for equality objects in a arrangement based on the nature and functions it performs with compare , search base classification objects with to contrast as well as classify based on one or more characteristics or characteristic or its function .
3. Forecasting / predicting , Forecasting in knowledge science made on base structured observations and inferences become a connection between events or observed facts . Skills predict is a skills create / submit estimation about something that has not been done happen based on a profit or the pattern that has been There is .
4. Communicating Communicating covering activity put data to in a number of form that can understood by others. Activities This involving ability to express in form oral , written, pictures , graphs , and equations .
5. Use tools and measurements , Using tools and do measuring very important in science . Measurement should done with careful and accurate . Ability This related with development attitude scientific that wants to achieved .

### **Definition of Experimental Method**

Introduction about science should be done since age early with fun activities and through habituation for children experiencing the scientific process directly. That thing done so that the child not only know the result just but also can understand the process of scientific activities that he does. Science allows child do exploration to various thing, good object life and also dead. In addition, it can also practice child use five his senses For know various symptom objects and events. For support for this process to occur, teachers need to method proper learning For child educate. Children aged early need methods that can make they interact direct with activities carried out. In this case the teacher can use method experiment ( Syafril, 2023). Experimental activities are active processes of child-centered learning that can encourage children to discover and develop new concepts or ideas followed by stimulating children's minds to be critical and creative. Experimental activities can encourage children to experience and make direct observations so that it will make it easier for them to understand natural events around them. The experimental method will also lead to the development of children's problem-solving skills, creativity, and independent learning. Experimental activities invite children to think critically because children do not simply accept or reject something. Children will observe, analyze and evaluate the information available before making their decisions. According to Hermiati ( in Yani, 2023) states that the experimental learning method is a step in learning observation where students use experimental activities that have been carried out and prove their own truth. The experimental method is a learning method that places children as active subjects to carry out and find their own knowledge and to know the truth of something. The experimental method is seen as one approach, creating a learning environment that can encourage children to construct knowledge and skills personally. When learning using the experimental method is carried out collaborative learning in small groups of children. Syaiful Sagala ( in Chasanah, 2023) Method is a way used by teachers to establish relationships with students during learning. While an experiment is an attempt to prove a certain statement and hypothesis. Therefore, the experimental method means a way of presenting learning materials where children conduct experiments by experiencing or practicing directly to prove for themselves a statement or hypothesis being studied. In the learning process using the experimental method here, students are given the opportunity to experience for themselves, follow the process, observe an object, a certain condition or process. Sumantri ( in Syahrani, 2021 ) states that the experimental method is interpreted as a way of teaching and learning that involves students by experiencing and proving the process and results of the experiment themselves. The science experiment method is a form of learning that provides opportunities for early childhood to be trained to carry out a process and experiment. Experiments aim to be able to find and find various answers and problems faced through simple experiments and experiments. The advantage of experiments is that children are more confident in conclusions based on experiments that have been carried out by themselves. Children are also more trained in their more scientific way of thinking and children can find correct evidence of something they are studying and have learned (Zahra, 2019). The experiential method also gives children the opportunity and freedom to express and say what they think. After children observe the scientific process, children can independently find and identify answers to problems when conducting experiments (Ashari, 2022). Science is an interrelated concept that develops as a result of many observations and experiments, and is continuously tested and observed. The best introduction to science at an early age is through fun and entertaining activities to help children gain knowledge about the scientific processes they do, because scientific skills prioritize the process over the results (Rocmah, 2020). The experimental method is a way of introducing learning where children experiment by experiencing and demonstrating for themselves something they have learned through the following ability activities; 1) Observing, 2) Conducting simple experiments, 3) Communicating, 4) Connecting cause and effect 5) Making simple conclusions

(Ashari, 2023). Based on several opinions expressed by the experts above, it can be concluded that the experimental method is a method used by a teacher in learning activities, where students experiment with something, observe, experience, and prove for themselves something that is learned. The learning process with this experimental method gives students the opportunity to experience or do it themselves, follow a process, observe an object, analyze, prove, and draw their own conclusions about a particular object, condition, or process.

## METHODS

Analysis of the data used in study This is descriptive data analysis qualitative-quantitative . According to Sugiyono (2017), data analysis is a process of searching and compiling in a way systematic data obtained from results interviews , observations , and documentation with method organize data into in category , described to the units, carry out synthesis , composing to in patterns , choosing what is important and will studied , and made Conclusion . Qualitative data analysis used For determine stated process improvement in A predicate , whereas quantitative data analysis used For determine improvement results with use percentage . Analysis qualitative in study This stated in A predicate that refers to a statement condition and size quality so that results evaluation in the form of number Then changed become A predicate . In research this , researcher use BB predicate (Not Yet Developed ) , MB (Starting to Develop ) , BSH ( Developing ) As Expected), BSB ( Developing Very Well) which then described ( PAUD Curriculum 2013). Analysis done on every cycle use formula as following :

NP

$$= \frac{R}{SM} \times 100\%$$

Information :

NP = Percentage value sought or expected  
R = Raw score obtained student  
SM = Ideal maximum score of test  
100 = Number still ( Ngalim Purwanto, 2020).

The formula explains that the data analysis carried out uses data obtained from the observation score results, namely by adding up all the scores on each indicator to produce a raw score (R) and then SM is obtained by calculating the total maximum score, then entering it into the formula so that the percentage of action results appears.

## RESULTS

After completing the assessment of the results of the action using the observation sheet format, then analyze the results of the observations to obtain a picture of the impact of the actions that have been carried out. What things need to be fixed so that the results of the reflection of the activities that have been carried out are obtained. See the following table:

**Table 1 Recapitulation of data analysis results from reflection on improving science skills through the experimental method of making bean sprouts from green beans in cycle I.**

No	Child Name	Score Raw	Percentage (%)	Criteria
1	AD	12	75%	BSB
2	A.F.	11	68.75%	BSH
3	AY	12	75%	BSB
4	CA	12	75%	BSB
5	CB	12	75%	BSB
6	DF	11	68.75%	BSH
7	LH	11	68.75%	BSH
8	NA	12	75%	BSB
9	PA	11	68.75%	BSH
10	QA	12	75%	BSB
11	RS	11	68.75%	BSH
12	CR	11	68.75%	BSH
13	ZA	12	75%	BSB
14	NH	12	75%	BSB
15	AX	11	68.75%	BSH
<b>Amount</b>		<b>173</b>		
<b>SM</b>		<b>240</b>		
<b>NP</b>			<b>72%</b>	<b>BSH</b>

Source: Table 1

NP

$$= \frac{R}{SM} \times 100\%$$

Information:

- NP = Percentage value sought or expected
- R = Raw score obtained student
- SM = Ideal maximum score of the test
- 100 = Fixed number

**Table 2 Criteria Evaluation**

Criteria	Percentage
Not Yet Developed (1)	0% - 24.99%
Starting to Develop (2)	25% - 49.99%
Develop As Expected (3)	50% - 74.99%
Developing Very Well (4)	75% - 100%

Source: Acep Yoni (2020: 175-176).

Based on the reflection data above on children in Group B at the Smart PAUD, Suka Bulan Village Regency Seluma, based on the observed aspects, it can be seen that 15 children showed the BSH assessment criteria as many as 7 people and BSB as many as 8 people. While the percentage of success from the expected percentage value (NP) for all observed aspects was 72% (BSH). From the data obtained in Cycle I, the researcher interpreted the results of the data calculation with the assessment criteria that had been set, it turned out that it

had not optimally achieved the success indicators that had been set according to Acep Yoni (2020) which was 75% - 100%. Based on these data, it can be concluded that the improvement of science skills through the experimental method of making bean sprouts from green beans in group B at the Smart PAUD, Suka Bulan Village, Seluma Regency. Through the action, the percentage of overall success obtained by children in Cycle I was 72% which was still in the criteria of Developing According to Expectations (BSH) and had not achieved the success indicators set by the researcher so that an evaluation was needed in the implementation of cycle I, so that when the implementation of the next cycle could develop optimally. This indicates that the action needs to be continued in cycle II.

Cycle II Action I .

Held on date, 04 May 202 4. The stages of action are as follows:

Planning Stage

1. Making RPP
2. Prepare tools and materials to be used used For play
3. Prepare sheet observations that contain indicator evaluation the current aspect observed

Implementation stage

1. Educator invite child pray before start activity
2. Educator to pronounce regards
3. Educator ask news children
4. Educator do presence to children
5. Educator explain to child about learning
6. Educator grouping child into two groups For do test
7. Educator invite child For do test make bean sprouts from peanut green
8. Participant d idik do activity test
9. The teacher does evaluation

### Observation/monitoring stage

It is carried out during the ongoing activities from the beginning to the end by referring to the observation sheet referring to the aspects assessed based on the research indicators. The results of the cycle II observations can be seen in the following table:

**Table 3 Data from observations of improving science skills through the experimental method of making bean sprouts from green beans in Cycle II.**

No	Child Name	Indicator																Amount Score	
		Children can observe				Children can do simple experiments				Children can communicate				Children can connect cause and effect					
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
1	AD				4				3					4				4	15
2	A.F.				4				3					3				4	14
3	AY				4				3					3				4	14
4	CA				4				3					4				4	15
5	CB				4				3					3				4	14
6	DF				4				3					4				4	15
7	LH				4				3					4				4	15
8	NA				4				3					3				4	14

9	PA				4			3					3				4	14
10	QA				4			3					3				4	14
11	RS				4			3					3				4	14
12	CR				4			3				4					4	15
13	ZA				4			3					3				4	14
14	NH				4			3					3				4	14
15	AX				4			3					3				4	14
<b>Total number</b>																	<b>215</b>	
<b>Maximum Score</b>																	<b>16</b>	

### Reflection Analysis Stage

After completing the assessment of the results of the action using the observation sheet format, then analyze the results of the observations to obtain a picture of the impact of the actions that have been carried out. What things need to be fixed so that the results of the reflection of the activities that have been carried out are obtained. See the following table.

**Table 4 Recapitulation of data analysis of the results of reflection on science abilities through the experimental method of making bean sprouts from green beans in Cycle II.**

No	Child Name	Score Raw	Percentage (%)	Criteria
1	AD	15	93.75%	BSB
2	A.F.	14	87.5%	BSB
3	AY	14	87.5%	BSB
4	CA	15	93.75%	BSB
5	CB	14	87.5%	BSB
6	DF	15	93.75%	BSB
7	LH	15	93.75%	BSB
8	NA	14	87.5%	BSB
9	PA	14	87.5%	BSB
10	QA	14	87.5%	BSB
11	RS	14	87.5%	BSB
12	CR	15	93.75%	BSB
13	ZA	14	87.5%	BSB
14	NH	14	87.5%	BSB
15	AX	14	87.5%	BSB
<b>Amount</b>		<b>215</b>		
<b>SM</b>		<b>240</b>		
<b>NP</b>			<b>89%</b>	BSB

Source : Table 4

NP

$$= \frac{R}{SM} \times 100\%$$

Information:

- NP = Percentage value sought or expected
- R = Raw score obtained student
- SM = Maximum score of test idea
- 100 = Fixed number

**Table 5 Criteria Evaluation**

Criteria	Percentage
Not Yet Developed (1)	0% - 24.99%
Starting to Develop (2)	25% - 49.99%
Develop As Expected (3)	50% - 74.99%
Developing Very Well (4)	75% - 100%

Source: Acep Yoni (2020).

From the reflection data above after the action in cycle II, it shows that the development of receptive language in group B at PAUD Cerdas Desa Suka Bulan, Seluma Regency, has increased well, it can be seen that 15 children from the observed aspects showed the assessment criteria of Developing Very Well (BSB) . This is because there is a time gap given to help children understand the concept of the game given before entering cycle II. The overall percentage of success obtained in Cycle II was **89%**. This shows that it is in accordance with the success indicators that have been set, namely 75% - 100%. So the cycle was stopped in this second cycle.

## DISCUSSION

Action research was conducted to determine the improvement of fine motor development through pattern cutting activities in group B at the Smart PAUD, Suka Bulan Village, Seluma Regency. The results of the study in Cycle I, can be seen to have increased gradually. The improvement achieved in Cycle I has not reached the established success indicators. In Cycle 1, children's science abilities through the experimental method of making bean sprouts from new green beans, *it reached 7.2 %* with the criteria of Developing According to Expectations. The results of the percentage of achievement obtained in Cycle I have not reached the expected percentage according to A cep yoni (2020) by 75 % - 100% or with BSB criteria , so that the research was continued in Cycle II.

The results of the research in Cycle II, it can be seen that the children's abilities have increased drastically. The improvements achieved in Cycle II were able to achieve the success indicators that had been set. The percentage of achievement results obtained in Cycle II managed to achieve the criteria of Very Good Development (BSB) with a percentage increase of 8-9 % . In this cycle, children were able to carry out science activities through the experimental method of making bean sprouts from green beans well.

This is in accordance with the literacy indicators according to Permendikbud No. 137 of 2014, namely children can observe , can do test simple , can to communicate as well as can connect because consequence . Comparison of the achievement of the percentage of increasing fine motor development through pattern cutting activities in group B at the Smart PAUD Suka Bulan Village, Seluma Regency , during Cycle I to Cycle II conditions can be seen in the increase in percentage achievement as follows:

**Table 6. Increase in percentage results of children's science abilities through the experimental method of making bean sprouts from peanuts green in Cycle I and II actions.**

No	Action	Percentage Cycle I	Percentage Cycle II
1	Children can observe	7 2 % (BSH)	8 9 % (BSB)
2	Children can do test simple		
3	Children can to communicate		
4	Children can connect because consequence		

Based on the table, the implementation of actions in Cycle I, the percentage of acquisition of 7.2 % (BSH criteria) has not reached the expected criteria so it needs to be continued in Cycle II. Cycle II shows an increase compared to the actions in Cycle I, the percentage of achievement at stage Cycle II is 8-9 % or criteria ( BSB) . Based on the percentage of achievement results in Cycle II, the success indicator has been achieved, there has been an increase in group B students in the Smart PAUD unit in Suka Bulan Village, Seluma Regency, this is in line with the assessment criteria applied according to Acep Yoni (2020).

## CONCLUSION

Based on the research results and discussion, the researcher concluded that through experimental method of making bean sprouts from peanuts green can improve children's science skills in group B at the Smart PAUD Suka Bulan Village, Seluma Regency. The increase can be seen from the increase in percentage after the implementation of actions in cycle I and cycle II. The implementation of actions in cycle I, the percentage shown from cycle I was 7.2 % . The implementation of actions in Cycle II showed an increase compared to the actions in Cycle I. The percentage of achievement results in Cycle II was 8-9 % in the criteria of Very Well Developed. This means that the research success completion criteria were achieved at 75 % - 100%. according to Accept Yoni (2020).

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