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Introduction of Early Science Learning Through Open Inquiry Approach on 5-6 Years Old Children at TK Muslimat NU 14 Kendal

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Abstract

The purpose of this study is to determine the effectiveness of open inquiry approach in introducing the early science learning to 5-6 years old children at TK Muslimat NU 14, Kendal. The type of this study is pre-experimental design with one group pretest-posttest design. The sampling applied purposive sampling technique with group B of TK Muslimat NU 14 Plantaran as experimental class. Hypothesis test in this study applied paired sample t-Test calculation obtained from pretest and posttest results. The t-test result obtained t value of -14.777 with significance (2-tailed) 0.000 <0.05, which means there is a significant difference between the value of pretest and posttest. The mean is -12.76. The minus sign indicates that the average of the first group (pretest data) is smaller than the second group (posttest data). So, HO is rejected and Ha is accepted. It shows that there is difference of mean of pretest and posttest value. It can be concluded that the open inquiry approach is an effective approach used for the introduction of early science learning on 5-6 years old children.

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INTRODUCTION

Education is an effort to improve and produce potential human resources, quality, and has advantages for the progress of a nation and state, including Early Childhood Education which is the basis of education level. Early Childhood Education is a coaching effort aimed at children from birth up to the age of 6 years. This is in accordance with the provisions of law number 20 on the National Education System. According to Masitoh in (Ratnasari, 2015: 1) Early Childhood Education is the provision of efforts to stimulate, guide, nurture, and provide learning activities that will result in the abilities and skills of the child. So it can be concluded that Early Childhood Education is an effort to stimulate the physical and spiritual growth of children to prepare children in further education.

Early childhood is in the period of golden age and critical period at the stage of human development. According to Umaroh (2013) early childhood is at the most unique and sensitive time in the lives of children. This age is a very good time for all aspects of growth and development in early childhood. How to stimulate early childhood development one of them through the provision of teaching and education with creative and innovative and create an interesting learning atmosphere and fun for children. Creative and innovative teaching can not be separated from the selection of appropriate strategies or learning approach and accompanied by supporting media so that learning will be more meaningful. According to Hamruni (2012: 7) the more appropriate approach used in teaching will be more effective learning activities. In addition, Fiani (2012) also stated that in learning needs to be chosen and observed approaches to learning in accordance with the situation, can mengobtimalkan performance of the brain, and improve the motivation to learn children. Therefore, one of the ways used to achieve effective learning so as to create an interesting and fun learning atmosphere by using open inquiry approach.

Learning that using open inquiry approach will make the child more interested and enthusiastic in following a learner process. Open inquiry approach by Wolfinger (Damaryanti, 2013: 10) is a form of learning approach that frees and provides opportunities for children, where children are placed as researchers of the activities of the environment that became the target of his research. The open inquiry approach is one of the learning approaches that allow children to engage directly and make children more confident about the results they get. In addition, this approach can also make children able to think critically, creatively and skillfully. According to Schlerker's research results (Joyce and Weil, 1992) demonstrate that inquiry practice can increase understanding of science, be productive in creative thinking, and children become skilled in obtaining and analyzing information (Trianto, 2011: 167). The open inquiry approach is commonly used in the fields of science and technology.

The field of science and technology is a very important field in this era of globalization. So the introduction of early science learning is needed to create human beings who have superior quality resources in the field of science and technology. But ironically the science of science in Indonesia is still a frightening thing for the students, even considered far from the world of children. Learning science is considered something that is too exact for children to learn. Though science learning in Kindergarten has many benefits in increasing the ability of cognitive development of children. This is in line with the views of Seefeldt and Wasik (2008: 411) which states that kindergarten is a place where children are encouraged and taught how to ask questions, plan and conduct investigations, and organize children's thoughts and discoveries, reflect and generalize, and convey ideas -ide them to others. So it can be concluded that early childhood education is not far from science learning that is scientific.

The process of scientific thinking is very well taught to children from an early age, so that children trained to think logically, critically, creatively and facilitate the child in the process of mastery of the material they get. Scientific thinking is also supported in Bloom's (Madya, 2011) theories about Higher Order Thinking Skill (ability to think high level) which is divided into three levels of cognitive domains that are analyzing, evaluating, and creating. According to Charlesworth and Lind (1990) basic science skills that can be developed for early childhood that consists of observing, comparing, measuring, classifying, and communicatting (Aisiyah, 2014 : 158-159). So from the opinion can be concluded that the beginning science skill that can be developed in early childhood is the skills to observe, classify (conduct experiments), and communicate.

Introduce science to children from early age according to the development stage because early age is the fundamental age for individual

development and often called by a golden age (Rahayu & Waluyo, 2015). Science learning activities for early childhood should be tailored to the child's developmental level and should emphasize the process rather than the outcomes of the child. One of the efforts that can improve the ability of introduction of early science learning for children is by using open inquiry approach. The open inquiry approach is a learning approach that can improve the critical thinking ability, creative, skilled, logical, and also play an active role by engaging directly in a trial process.

In formal school institutions where researchers do the observation that is in Kindergarten Muslimat NU 14 Plantaran Kaliwungu District Kendal District. Kindergarten Muslimat NU 14 Plantaran is an educational institution based on Islam, so the learning process is identical with Islamic belief. This kindergarten uses the learning model of the area although it is still classical. In Kindergarten Muslimat NU 14 Plantaran, especially group B has not done much science learning using open inquiry approach. Educators more often use lecture methods and work on worksheets. This approach makes the child bored easily, lack of concentration, and less enthusiastic in following the learning. This situation ultimately makes the learning conditions to be not conducive and effective for children. The approach is also less able to build the initial science skills that should be obtained by children when studying science that is the ability to observe, classify, and communicate. The medium used for science learning is also rough and limited. This makes the child less able to explore himself in the learning process and still difficulties in understanding the contents of the material.

Based on the problems above, the researcher chose to use open inquiry approach to teaching and learning process in introducing early science learning, because this approach can make children active, creative, critical and logical thinking. this approach is expected to make it easier for children to understand the contents of the material and master the concept of the material delivered with a sense of interest, excitement, and passionate when following the learning process provided by educators. Then the child can also have early science skills that will later help him ditahap next level of education. On that basis the researchers are interested to conduct further research on children in Group B Kindergarten Muslimat NU 14 Plantaran Kendal District by implementing the introduction of early science learning through open inquiry approach in children.

METHOD

In this study there are two variables, namely, early science learning children aged 5-6 years as a dependent variable and open inquiry approach as independent variables. The type of research used is Pre-Experimental Design with One-Group Pretest-Posttest Design design. Sampling using purposive sampling technique with group B TK Muslimat NU 14 Plantaran which amounted to 30 children as experiment class. Methods of data collection using observation and documentation. Analysis of the instrument in this study using validity analysis of 0.334 and reliability with Alpha value of 0.951 through the help of SPSS 16.0 for Windows program. Then for data analysis methods used through descriptive data analysis and data analysis using normality test, homogeneity test, and hypothesis test with the help of SPSS 16.0 for Windows.

RESULTS AND DISCUSSION

This research took place in the Muslimat NU 14 Plantaran kindergarten located in Dukuh Tangkisan RT.01 / RW.O7 Plantaran, Kaliwungu Selatan District, Kendal District. Level of early science learning ability of children aged 5-6 years before (pretest) and after (posttest) is treated using

Table 1. Category Pretest and Posttest Levels of Early Science Learning Capability of 5-6 Years Old Children

Experiment Group							
Pretest				Posttest			
Interval	**Total**	**Percentage**	**Criteria**	**Interval**	**Total**	**percentage**	**Criteria**
42-83	1	3,3%	Law	42-83	0	0,0%	Law
84-125	25	83,3%	Medium	84-125	9	30,0%	Medium
126-168	4	13,3%	High	126-168	21	70,0%	High
Total	30	100%			30	100%	

open inquiry approach can be seen in table 1.

Based on table 1, it can be found that at the early learning science level of children aged 5-6 years before being given treatment (pretest) is generally in the medium category with the number of children as much as 25 or percentage of 83.3%. Whereas after being given treatment (posttest) using open inquiry approach, the level of early science learning ability of children aged 5-6 years is generally in the high category with the number of children as much as 21 or 70% percentage index.

Hypothesis testing of this research using test difference of two average of pretest and posttest data which done by calculation of Paired Sample t-Test. The results of hypothesis testing using Paired Sample t-Test can be seen in table 2.

Based on the result of t test, it is found that t-value> t count> t table (-2,045> -14,777> 2,045), significant (2-tailed) = (0,000), so Ho is rejected and Ha accepted means there is significant difference level of early science learning ability of children aged 5-6 years after using open inquiry approach.

This experimental research using treatment (treatment) in the form of creative and innovative teaching, as well as create an interesting learning atmosphere and fun for children is through open inquiry approach. The open inquiry approach is a learning approach that can improve the critical thinking ability, creative, skilled, logical, and also play an active role by engaging directly in a trial process. This approach is also very appropriate to be used in studying the scientific field that is scientific.

According to Wolfinger (Damaryanti, 2013: 10) the open inquiry approach is a form of learning approach that frees and provides opportunities for children, where children are placed as researchers of the activities of the environment that became the target of his research. With this discovery activity, child curiosity will also be met as well as early science skills or skills can be developed as well as exploring, classifying (experimenting), and communicating. In the open-inquiry approach, the topics or media used are not limited to the topics used in this research (topics of sinking and floating, insoluble and insoluble materials, mixing colors, playing bubbles, and drifting egg experiments) on experimental activities that have been designed / designed by researchers. Simple activities such as inviting children to visit rice fields, livestock enclosures, or viewing different types of leaves around the school, etc. can also be done. This kind of activity will actually make children really learn and find something new that will stimulate the cognitive development of children, especially in terms of logical thinking, critical, skilled and creative.

Learning science is essentially an attempt made to study a science of knowledge about phenomena or symptoms as well as certain objects of nature. Knowledge is gained through a systematic, organized, and scientific methodological and experimental study (experimentation and observation) and through scientific methods. The process of scientific thinking is very well taught to children from an early age, so that children trained to think logically, critically, creatively and facilitate the child in the process of mastery of the material they get. Scientific thinking is also supported in Bloom's (Madya, 2011) theories about Higher Order Thinking Skill (ability to think high level) which is divided into three levels of cognitive domains that are analyzing, evaluating, and creating. In this study, the ability of children to think at a high level is still at the level of analyzing (analyzing). This is evident from the child's scientific abilities at the level of exploring (observing and identifying), classifying (conducting simple experiments), and communicating. This ability is a basic ability in science learning. Then the presence of children aged 5-6 years at the level of analyzis is also influenced by the way of thinking of children who are still in transition from the Pre-operational phase to the concrete operational phase. According to Piaget in the concrete phase of operational cause-effect relationships have begun to develop but the thin-

Tabel 2. Result Calculation Paired Sample t-Test

Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	Pretest – Posttest	-12.767	4.732	.864	-14.534	-11.000	-14.777	29	.000

king is not yet fully logical. In addition, scientific thinking has also been incorporated into the concept of learning curriculum 2013 which is set on PERMENDIKBUD 146 Year 2014 on Learning Guidelines.

After gradual treatment using open-inquiry approach, early science learning ability of children aged 5-6 years experienced improvement in the three aspects of exploring, experimenting, and communicating. The results of this study can not be separated from the use of open inquiry approach which is expected PAUD teachers can provide creative and innovative learning but still tailored to the needs of children. Then the teacher should emphasize the process rather than the results obtained by the child.

A study conducted by Laily Nur Aisiyah (2014) entitled improving basic science process skills with the open inquiry approach stated that the study recommends that teachers use the open inquiry approach in science learning. This study aims to know comprehensively efforts to improve the basic science skill of children group B in TK Muslimat 02 Singosari Malang. This research states that open inquiry approach can improve basic science process skill in group B TK Muslimat 02 Singosari Malang. This is evident from the results of research showing an increase to the basic science process by 70% after using the open inquiry approach.

Based on the above relevant research, the researchers draw the conclusion that the use of open inquiry approach that has been applied can improve early learning science capability of children aged 5-6 years. Changes in early science learning ability can be seen in the aspects of exploring, experimenting, and communicating. So it can be concluded the use of an effective open inquiry approach is used for the introduction of early science learning in children aged 5-6 years.

CONCLUSION

Based on the results of research and discussion, it can be concluded that the open inquiry approach is an effective approach used for the introduction of science learning in children aged 5-6 years. This is obtained based on the result of the statistical calculation done with the t-test test data through Paired Sample t-Test difference test in the SPSS program. Test result t-test obtained t count value <- t table (-14,777 <-2,045), with significant (2-tailed) of 0.000. This indicates that there is a significant difference in early science learning of children aged 5-6 years before and after being treated by using open inquiry approach. Then also supported from the increase of mean value at introduction of early science learning of children aged 5-6 years that is from 117,17 to 129,93 so that there is an increase of score equal to 12,76. This means that the average value of early science learning of children aged 5-6 years after being given treatment using an open inquiry approach is higher than before being given treatment.

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