

Implementation of Playing Methods in Learning Science in Improving Children's Critical Thinking Ability in Raudhatul Athfal Assyifa Medan

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Abstract

The purpose of this study was to determine: (1) the implementation of playing methods in science learning at Raudhatul Athfal Assyifa Medan. (2) children's activities in participating in science learning at Raudhatul Athfal Assyifa Medan, and (3) the application of play methods can improve children's critical thinking skills in science learning. The study was conducted at Raudhatul Athfal Assyifa Medan. The method used is a qualitative research method. Data sources are the principal, teachers and students. Data retrieved through observation, documentation, and interviews. Data are analyzed based on data reduction, data presentation, and conclusions. The research findings show: (1) the implementation of play methods in science learning at Raudhatul Athfal Assyifa Medan, presented through various science experiment activities that can improve children's critical thinking skills. This can happen, because in science learning done with fun through science experiments that are packaged in playing while learning, children are not burdened with things that are academic because actually the nature of learning in kindergarten emphasizes more fun learning activities so the concept of play is very strong, (2) children's activities in participating in science learning at Raudhatul Athfal Assyifa Medan showed a positive response in this case because learning is done while playing that brings children to a pleasant atmosphere because science experiments applied are varied experiments in which there are children's activities to think critically, and (3) the application of play methods can improve children's critical thinking skills in learning science.

Keywords

playing methods; learning science; critical thinking ability



I. Introduction

Learning is the process of changing behavior due to interactions among individuals and the environment. Changes in behavior include changes in knowledge, understanding, attitudes, skills, motivation, interests, thinking abilities and so on. Suparman (2012: 16), argues that "learning is a process of behavior change that can be observed by others including by teachers". Dwidayani (2013:55) states that, "Learning outcomes are measures of success or failure of students after taking teaching and learning activities both in terms of effective, psychomotor, and cognitive which includes knowledge (memory, understanding, application (application)". Learning outcomes are a form of achievement students as well as a symbol of the success of educators in learning students (Yusuf in Sitorus, 2019).

Science learning is intended to provide meaningful experiences to children and also train critical thinking skills, because in science learning children understand various concepts

they learn through direct experience and connect with concepts they have mastered without eliminating the element of play that is indeed "the world" of children.

In accordance with the characteristics of the age of Raudhatul Athfal, the increase in children's critical thinking skills is done through play that is done in science learning. Therefore, an increase in children's critical thinking skills can be done by the teacher in science learning activities, for example the teacher shows some toy objects which among the game objects are hidden letters placed in the science area.

After the process is passed, the teacher invites children to sing according to the material being learned. The point is that through play and science learning activities carried out by children there is an element of increasing critical thinking skills.

This fact is important to get attention, so that the teaching staff at Raudhatul Athfal Assyifa Medan are helped in overcoming problems in learning. In this case efforts that can be made to improve children's critical thinking skills are through science learning activities. The main characteristic of science learning is learning activities without placing a burden on children, so that the concept of learning at an early age is dominant by playing firmly held and learning activities are more emphasized on children's creativity.

To answer that problem, a meeting was held between the schools in this case represented by the teacher Raudhatul Athfal Assyifa Medan with researchers. Considering that the problem is felt by the teacher in the implementation of learning activities in the classroom, and the efforts that will be made aiming to improve, enhance or change learning towards a better direction and the results can be seen and witnessed by the teacher and child, then the meeting is determined to be assessed with research that is reflective of the results of the learning process.

II. Review of Literature

Riyanto and Handoko (2010) explain that playing and singing and doing activities are the three most appropriate characteristics of early childhood education. The function of play in children is to stimulate motor development, emotions, and reasoning of children. Play activities are any activities as long as they are in a pleasant atmosphere so playing the keywords is fun.

Musfiroh (2008) explains play is an activity carried out on the basis of pleasure and without considering the final result. These activities are carried out voluntarily without coercion or pressure from outside parties. Furthermore Musfiroh (2008) explains play for children related to events, situations, interactions and actions that refer to activities such as pretending to pretend with objects, sociodramas, and regular play. In this case play is related to three things, namely participation in play activities, affective aspects, and goal orientation.

Hilderbrand, as quoted by Isjoni (2010), explained that playing means practicing, exploiting, manipulating, repeating any exercise that can be done to transform the imagination of the same things as the adult world. Furthermore Groos as quoted by Yus (2011) explains that playing is a process of preparing oneself to assume the role of an adult.

Yamin and Sanan (2010) explained that there are five meanings related to play, namely: (1) something that is fun and has a positive value for children, (2) has no extrinsic purpose, but the motivation is more intrinsic, (3) is spontaneous and voluntary, (4) involves the active participation of children, and (5) has a special systematic relationship with something that is not playing such as the ability of creativity, ability to solve problems, language learning, social development, discipline, controlling emotions and so on.

Isjoni (2010) explains that there are 14 values contained in play activities, namely: (1) helping the growth of children, (2) activities carried out voluntarily, (3) giving the child freedom to act, (4) giving an imaginary world that can be mastered, (5) has an element of adventure in it, (6) lays the foundation of language development, (7) has a unique influence on interpersonal relationships, (8) gives an opportunity to master oneself well, (9) broadens interest and concentration, (10) is a way for children to investigate something, (11) is a way for children to learn the role of adults, (12) is a dynamic way to learn, (13) clarifies children's considerations, and (14) play can be structured academically.

Some of the characteristics of play activities are explained by Tedjasaputra (2003) as follows: (1) based on intrinsic motivation, which means arising from personal desires and for their own interests, (2) the feelings of people involved in play activities colored positive emotions, (3) flexibility that is marked by the ease of activities switching from one activity to another, (4) more emphasis on the process that takes place rather than the final result, (5) free to choose the type and form of play used, and (6) has the quality of mock.

Leeper as quoted by Nugraha (2008) explained that science learning in early childhood is aimed at realizing four things, namely: (1) the development of science learning in early childhood is intended so that children have the ability to solve problems encountered through the use of scientific methods, so that children are helped and become skilled in solving various problems they face, (2) the development of science learning in early childhood is intended so that children have a scientific attitude. The basic thing is for example not being quick in making decisions, being careful about the information received and being open, (3) the development of science learning in children is intended so that children get scientific knowledge and information, and (4) the development of science learning in children is aimed at to children to be more interested and interested in living the science that is and is found in the environment and surrounding nature.

The purpose of learning science given to children Raudhatul Athfal explained Nugraha (2008) are: (1) helping children understanding of science concepts and their relationship with daily life, (2) helping to attach aspects related to science process skills, so that knowledge and ideas about the nature around in children become developed, (3) help foster interest in children to recognize and learn about objects and events outside their environment, (4) facilitate and develop an attitude of curiosity, perseverance, openness, critical, introspective, responsible, cooperating and independent in their lives, (5) helping children to be able to use simple technology that can be used to solve problems found in everyday life, and (6) helping children to be able to recognize and foster a love for the natural surroundings, thus realizing the greatness and majesty of God.

Science learning in Raudhatul Athfal should pay attention to principles that are oriented to the needs of children, namely: (1) oriented to the needs and development of children is the child's developmental needs for a sense of security. Therefore, if the physical needs of children are met and feel psychologically safe, the child will learn well, (2) playing while learning is an approach in conducting science learning activities in Raudhatul Athfal, (3) selective, creative and innovative, this is related to science material presented to children is selected in such a way that it can be presented through play, and (4) the process of learning science is done through activities that are interesting, arouse curiosity, motivate children to think critically and discover new things (Nugraha, 2008).

Regarding the science learning method in Raudhatul Athfal explained Nugraha (2008), namely: (1) the play method, (2) the field trip method, (3) the method of conversing, (4) the method of storytelling / storytelling, (5) the method of demonstration, (6) the project method and (7) the assignment method.

Science teaching materials given to children Raudhatul Athfal accordingly are: (1) recognizing objects around them according to size (measurements) included in this topic are weighing, measuring and measuring, (2) balloons are blown then released, air moves, (3)

objects objects put in water (floating, floating, sinking, (4) objects dropped (gravity), (5) experiments with magnets, (6) observing with a magnifying glass, (7) trying and distinguishing various flavors , odor and sound, (8) color mixing, and (9) plant growth processes.

Thinking is a mental activity that involves the work of the brain, in this case the activity of thinking also involves the entire human person and also involves human feelings and will. Thinking about something means directing yourself at a particular object, being aware of its presence while actively presenting it in your mind and then having an idea or insight about that object (Sobur, 2009).

Santrock (2008) explains thinking is manipulating or managing and transforming information in memory. Thus thinking is an individual means to appreciate, explore and change the contents of the world and plan actions that can change the outside world. Thinking is a process of planning, remembering and releasing something that is understood in accordance with the circumstances that are needed. In its development the ability of human thinking continues to develop. The results of human thought give birth to philosophy and science that are determined to benefit humans themselves.

Piaget as quoted by Santrock (2008) explains the stages of thinking development in children divided into four levels, namely (1) the motor sensory level, (2) the pre-operational level, (3) the concrete operational level, and (4) the formal operational level.

Associated with factors that influence the development of thinking explained Riyanto and Handoko (2010), namely: (1) physical environment means that contact with the physical environment is necessary because interaction between individuals and the outside world is a source of new knowledge. But contact with the physical world is not enough to develop knowledge unless individual intelligence can utilize the experience, therefore the maturity of the nervous system becomes important because it is possible to obtain maximum benefit from physical experience, (2) maturity means opening up possibilities for development whereas if it is lacking that would greatly limit cognitive achievement. Although maturity is an important condition for cognitive development, certain events are not predetermined. Development takes place at different speeds, depending on the nature of contact with the environment and activities of the individual itself, (3) the social environment means including language investment and education can stimulate or inhibit the development of cognitive structures in the child, and (4) equilibration means the process of regulation rather than enhancer on the other three factors. Equilibration regulates the specific interactions of individuals with the environment as well as physical experience, social experience and physical development. Equilibration causes cognitive development to run in an integrated and well-organized manner in the child.

III. Research Method

The study was conducted at Raudhatul Atfhal Asyyifa Medan. The method used is a qualitative research method. Data sources are the principal, teachers and students. Data retrieved through observation, documentation, and interviews. Data are analyzed based on data reduction, data presentation, and conclusions.

IV. Discussion

The learning implementation is described as follows: (1) the teacher enters the classroom by saying greetings, (2) the class has been designed according to the material "measurements" displayed as well as the seat position of the child, and (3) in accordance with the planned learning activities the activities learning is divided into three stages: initial activities, core activities and final activities with the details of their implementation as follows: (a) initial activities begin with marching activities before entering class, before

entering the class the teacher asks the names of objects or words that correspond to the material learned is related to measurement. Who can answer, the child will first enter the class while shaking hands with the teacher. In the classroom the teacher will attend the child's presence. Absence of the child's presence is carried out by the teacher absent one by one and then the child raises his hand or index finger by saying "attend mom". The activity continued with praying together before the lesson, then the teacher sang children's songs, the songs selected in accordance with the measurement material. The implementation of this initial activity is carried out daily, led by children in turn, (b) the core activities are carried out by the teacher by implementing the storytelling and experimentation activities vary according to the measurement material. These varied experimental activities had previously been planned with the teacher and researcher at each meeting. Varied experiments that measure the length of the chair with span, measure the length of the classroom floor with steps, measure using sticks, ribbons, straws, and measure with measuring devices such as rulers, sewing meters, and (c) the final activity, the teacher invites children to reconcile the results experiments that have been done, and ask children to collect the tools used.

At the beginning of the activity children are not familiar with science learning by the teacher, but at the next meeting they are used to it. In practice some children look happy especially when asked to do a science experiment, but there are still children who look lazy when asked to do science learning activities. Impressed Teachers have difficulty in coordinating because of the many children, as a result not all children are successfully monitored properly. Difficulties are also experienced when children practice what is asked by the teacher because there are still children who do not master the material presented. To improve children's critical thinking skills, the researchers see it is better if children are involved more intensively in science learning activities, so that children are active and can come up with new ideas and ideas.

The teacher applies various science experiments in accordance with the plans that have been prepared previously, such as color and magnetic science experiments. Implementation varies so that children are not fed up with monotonous situations. Some things were observed in its implementation, such as the game, the teacher not only gave an example but also involved the child to be directly involved in learning activities. The aim is to see the ability to think critically.

The results of these observations indicate that the ability to think critically on the aspect of making combinations in weighing is the aspect that obtains the highest yield while the aspect of determining objects that are useful for measuring length gets the lowest result. For more details, see Table 1 below:

Table 1. Data on Critical Thinking Ability in Observation I

Score Interval	f_{absolute}	f_{relative}	Category
9 – 15	3	12,50	Low
16 – 21	4	16,67	Less
22 – 28	4	16,67	Middle
≥ 29	13	54,16	High
Total	24	100	-

Based on Table 1 above, it is known that the range of scores 9-15, the category of critical thinking skills of children is as low as 3 children or 12.50%. The range of scores 16-21 then the category of critical thinking skills of children is less as 4 children or 16.67%. The range of scores 22-28 then the category of critical thinking skills of children is moderate as much as 4 or 16.67%. While the range of scores ≥ 29 , the category of critical thinking skills of children is high as many as 13 children or 54.16%.

Based on the second observation that researchers do that science learning that has been applied by the teacher plays a role in improving critical thinking skills, this can be seen from the characteristics, among others: (1) estimating the causes, (2) making decisions, (3) making combinations, and (4) making alternatives. This is supported by data collected in the field and also based on the results of evaluations conducted by collaborators and researchers, the level of children's critical thinking skills is increasing when compared to before.

The results of these observations indicate that the ability to think critically on the aspect of making comparing two objects in activities playing with magnets and the aspect of determining errors in using magnets gets the highest results while the aspects of mentioning the colors from the results of mixing colors and making combinations in mixing colors obtain the lowest results .

Based on the field notes and the results of discussions between teachers and researchers, this study has reached the ideal target to be achieved, namely 80% of children in the class have reached a high level of critical thinking skills. For more details, see Table 2 below:

Table 2. Data on Critical Thinking Ability in Observation II

Score Interval	f_{absolute}	f_{relative}	Category
9 – 15	1	4,17	Low
16 – 21	1	4,17	Less
22 – 28	2	8,33	Middle
≥ 29	20	83,33	High
Total	24	100	

Based on Table 2 above it is known that the range of scores from 9 to 15 then the category of critical thinking skills of children is low by 1 child or 4.17%. The range of scores 16-21 then the category of critical thinking skills of children is less than 1 child or 4.17%. The range of scores 22-28 then the category of critical thinking abilities of children is moderate as much as 2 or 8.33%. While the range of scores ≥ 29, the category of critical thinking skills of children is high as many as 20 children or 83.33%. Because it has not yet reached the ideal target of achieving critical thinking abilities of children, 80% of children in the class have high critical thinking skills.

The research findings show that the learning activities carried out are presented through various science experiment activities that can improve children's critical thinking skills. This can happen, because in learning science that is done with fun through science experiments that are packaged in playing while learning, children are not burdened with things that are academic because the nature of learning in kindergarten emphasizes more fun learning activities so the concept of play is very thick.

This provides an explanation and affirmation that learning by playing method is one of the factors of concern to improve critical thinking skills. This is understandable because through the application of science learning carried out through various science experiments can increase the active participation of children in learning which in turn can lead to success and achievement of the learning objectives themselves. Thus the consequences if learning is not appropriate in learning it will certainly result in reduced active participation of children in learning. Through this research shows that in general there is a significant increase in critical thinking skills. The logical consequences of the application of science learning have implications for teachers to carry out science learning. By using science learning, teachers are expected to be able to arouse and motivate children's active involvement and participation and can create a more interactive and effective learning environment in achieving learning goals.

The findings of this study provide implications for educational providers that to carry out science learning must be supported by the availability of adequate learning tools or media, for that the availability of learning tools or media used in learning becomes the responsibility of education providers in general ways and teachers in general special. For this reason, it is hoped that school organizers will provide it or at least try to make it work through requests to relevant agencies or it can also be done to fulfill the learning tools or media budgeted in the school development plan.

These findings support previous research carried out including: (1) Sugiono and Kuntjojo's research (2016) shows that the Let's Kita Discover play model has proven to be effective in developing pre-calistung abilities in early childhood, (2) Mirawati and Nugraha's research (2017) shows that play activities in the garden are able to provide positive results on various aspects of integrated child development, and (3) Gita's research (2018) shows early childhood science learning through the introduction of plant parts can improve students' cognitive, affective and psychomotor abilities.

V. Conclusion

The conclusions that can be drawn from the research findings are: (1) the implementation of playing methods in science learning carried out is presented through various science experiment activities that can improve children's critical thinking abilities. This can happen, because in learning science that is done with fun through science experiments that are packaged in playing while learning, children are not burdened with things that are academic because the nature of learning in kindergarten emphasizes more fun learning activities so the concept of play is very strong, (2) children's activities in participating in science learning show a positive response in this case because learning is carried out while playing which brings children to a pleasant atmosphere because the applied science experiments are varied experiments in which there are children's activities to think critically, and (3) the application of play methods can improve children's critical thinking skills in science learning. This can be seen based on the results of observations in which the first learning observation experienced an increase in the second observation.

Recommendations that can be given as follows: (1) to teachers to always try to develop their abilities in carrying out learning tasks, especially in science learning by using a variety of play methods, (2) to the Raudhatul Atfhal education providers so that as much as possible to complete the means and media of learning science so that science learning can be carried out more varied and enjoyable, and (3) other researchers can examine variables outside of this research study which also contribute to improving children's critical thinking skills.

References

- Ananda, Rusydim, and Abdillah. (2018). *Pembelajaran Terpadu. Karakteristik, Landasan, Fungsi, Prinsip Dan Model*, Medan: Lembaga Peduli Pengembangan Pendidikan Indonesia (LPPPI).
- Gita, Rina Sugiarti.(2018) *Peningkatan Pembelajaran Sains Anak Usia Dini Melalui Pengenalan Bagian Tanaman Berbasis Alam Di TK Ar-Rahim Jember*. Jurnal Seling jurnal Program Studi Pgra Volume 4 Nomor 1 Januari.
- Isjoni. (2010).*Model Pembelajaran Anak Usia Dini*. Bandung: Alfabeta.
- Mirawati and Nugraha, Rini. (2017). *Meningkatkan Keterampilan Proses Sains Anak Usia Dini Melalui Aktivitas Berkebun*. Jurnal: Pendidikan.
- Musfiroh, T. (2008). *Cerdas Melalui Bermain*. Jakarta: Grasindo.
- Nugraha, A. (2008).*Pengembangan Pembelajaran Sains Pada Anak Usia Dini*. Jakarta: JILSI Foundation.

- Riyanto, T. and Handoko, M. (2004) Pendidikan Anak Usia Dini. Jakarta; Grasindo.
- Santrock, J.W. (2008). Educational Psychology 2nd Edition. Alih Bahasa: Tri Wibowo B.S. Psikologi Pendidikan. Jakarta: Kencana Predana Media Group.
- Sobur, A. (2009). Psikologi Umum. Bandung: Pustaka Setia.
- Sitorus, H. (2019). The Effect of Learning Strategy and Thinking Ability on The Students' Learning Outcomes in Economics Subject of XI Social Students in Senior High School State 1 in Pematang Siantar, Budapest International Research in Linguistics and Education Sciences (BirLE), P. 451-460.
- Sugiono dan Kuntjojo. (2016). Pengembangan Model Permainan Pra-Calistung Anak Usia Dini. Jurnal: Pendidikan Anak Usia Dini. Pascasarjana Universitas Negeri Jakarta Vol. 10 No 2 November.
- Tedjasaputra, M.S. (2003). Bermain, Mainan dan Permainan Untuk Pendidikan Usia Dini. Jakarta: Gramedia Widiasarana Indonesia.
- Yamin, M. and Sanan, J.S. (2010). Panduan Pendidikan Anak Usia Dini. Jakarta: Gaung Persada Press.
- Yus, A. (2011). Model Pendidikan Anak Usia Dini. Jakarta: Kencana Prenada Media Group.