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## Knowledge Acquisition in Early Childhood: An Analysis of Sand Play Activities

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### Abstract

Sand play activities are still rarely used as a source of learning to acquire children's knowledge at school. One of the factors is that parents often forbid their children to play in the sand with dirty excuses. Whereas with sand playing activities, children can easily explore according to their imagination and creativity and they can also develop three areas of development in acquiring knowledge, namely physical knowledge, knowledge of mathematical logic which is closely related to children's cognitive knowledge and social knowledge. The purpose of this study was to find out what knowledge was obtained in sand playing activities in early childhood. Respondents in this study were four children aged 3-4 years at Khalifah Daycare & Early Learning Center. The research instrument in this study was determined by the researcher himself, choosing information as a data source, collecting data using observation, interviews and documentation methods. Data were analyzed by following Miles and Huberman's interactive analysis model; data reduction, data display, and verification. This study shows that by doing sand play activities, children aged 3-4 years acquire four pieces of knowledge, including fine motor, logical-mathematical, social, and language skills.

**Keywords:** *sand play activities, knowledge acquisition, early childhood*

### Introduction

Early childhood education has the aim of developing all the potential that children have, both physically and psychologically which includes six aspects of development such as religious and moral values, cognitive, physical motor, language, social-emotional, and art so that children have the readiness to enter further education (Veryawan et al., 2021). The progress of this development is obtained through learning outcomes from the environment. Given the importance of the existence of an early age, it is necessary to provide optimal stimulation at that age, so that the growth and development of children can run as they should.

Early childhood is an individual who is experiencing a very rapid growth and development process, even said to be a developmental leap (Hasibuan et al., 2021). The development of cognitive abilities is a strategic point to be developed in early childhood. It could be stated that cognition is closely related to the development of other abilities (Suryaningsih & Rimpiati, 2018).

Beck (in Masna, 2016) stated that cognitive or intellectual is a thought process in the form of the ability or power to connect an event with other events as well as the ability to assess and consider everything that is observed from the world around. Cognitive itself is developing children's thinking skills to be able to process their learning acquisitions, so they can find various alternative problem solving, helping children to develop mathematical logic skills and scientific abilities. (Salim & Hariyanti, 2014).

Cognitive development is changing that occurs in children's thinking, intelligence, and language to provide reasons so that children can remember, strategize creatively, think about how to solve problems, and can connect sentences into meaningful conversation. (Kemendikbud, 2014). The standard level of achievement of child development or said as STPPA in aspects of cognitive development at the age of 5-6 years includes; learning and problem solving, logical thinking, and symbolic thinking. On learning indicators and problem-solving. One of the effective ways to develop cognitive aspects of early childhood is to play. School is a world of play for children. Therefore, education in schools is carried out using play methods and strategies (Fauziddin & Mufarizuddin, 2018). Children must acquire knowledge in their way because the rules of adult logic conflict with children's spontaneous beliefs and can confuse children. The knowledge provided through direct teaching about ideas or ideas labeled as knowledge will freeze children's initiative in constructing knowledge. In other words, getting children used to building knowledge from an early age can make them generations who can find ideas or ideas in problem-solving, have self-confidence, and have good initiative (Ginting, 2018).

Increasing children's cognitive abilities will affect children's daily behavior. Activities that can be conducted by educators to improve children's cognitive are by providing various

forms of games such as playing using sand media. It can be applied both in the classroom and outside. Because the world of children is a world of play, children play while learning or learning while playing (Hasriana et al., 2020). According to Piaget in (Jawati, 2013), at an early age children will go beyond the stage of cognitive play development starting from playing sensorimotor or playing related to the five senses to enter the highest stage of play where there are rules of play, where children are required to use reason. Play can bring hope and anticipation about a world that gives joy and allows children to fantasize like something or someone, a world that is prepared for adventure and study of a developing child's world (Elyana & Latief, 2018).

When conducting observations, researchers saw activities that were rarely applied to early childhood, one of which was playing with sand. Whereas with sand play activities, children can easily explore according to their imagination and creativity and they can also develop three areas of development in acquiring knowledge, namely physical knowledge, knowledge of mathematical logic which is closely related to children's cognitive knowledge, and social knowledge. Playing sand and water is a fun game, this game uses tools that can make children feel happy and are usually fun.

Wong, (Yusnira, 2015) stated that playing sand and water is a non-social stimulatory game. Objects in the environment are colors, tastes, smells, textures, and consistency that attract children's attention, stimulate their senses, and provide pleasure. The experience of their satisfaction comes from holding raw materials such as water, sand, and food. When the child is allowed to play in the sand, the child will be very cheerful and happy. But on the other hand, parents will usually forbid their children to play with the sand on the grounds of being dirty, messing with the sand, itching, and so on. In fact, with this sand media, children will easily explore according to their imagination and creativity. With sand, children can mix, stir, pile, dig, fill, pour, smooth sand with sand play equipment, and shape and play pretend to make cakes, houses, roads, bridges, ponds, and more (Asmah & Mustaji, 2014). In addition, children will find new things or new experiences about the natural environment by playing with sand, which is expected to raise curiosity further to explore the natural environment and appreciate

and love nature (Rahmatunnisa & Halimah, 2018). Through playing with sand, children can also move parts of their hands, wrists, and fingers (Pratiwi, 2017).

Previous research conducted by (Salma & Jumarni, 2020) on the use of colored sand media in children of Ummusshabri ECE Kendari City showed that sand media could stimulate all aspects of early childhood development; religious and moral values, fine motor, language, cognitive, social-emotional, and art. The results of the study of (Khamaliyah et al., 2019) also showed that the creativity of children aged 5-6 years using kinetic sand in the experimental class obtained an average score for the post-test of 47.43 while those using conventional learning in the control class obtained an average score of the average for the post-test is 41.43. It shows that the creativity of children aged 5-6 years who receive learning with kinetic sand is better than the creativity of children aged 5-6 years who receive traditional knowledge. In addition, research of (Melani, 2018) states that through sand playing activities, children can explore, hone creativity, train gross and fine motor skills, train concentration, develop emotional and personality aspects and even be able to know something happening around them or can develop naturalist intelligence of children. However, this study aims to determine what knowledge is obtained in sand-playing activities in early childhood.

## **Method**

The research method used in the research is qualitative, emphasizing the quality or description of research results rather than quantitative or the amount of data obtained. In this study, the research subject used a purposive sampling technique. Respondents consisted of 4 children aged 3-4 years, consisting of two children aged three years and two children aged four years at Khalifah Daycare & Early Learning Center. Researchers used three data collection techniques, namely observation, interview, and documentation techniques. They were analyzing following the interactive analysis model of Miles and Huberman; data reduction, display data, and verification. This research was conducted at the Khalifah Daycare & Early Learning Center, Medan, North Sumatra. The researcher carried out the time of this research from February to April 2019.

## Result

The results of research data on each indicator from the analysis of the knowledge obtained by early childhood in sand playing activities are:

### 1. Respondent A

Based on observations made to respondents on variable 1, respondent A looks able to pour and form sand using a playing tool in the form of a sand shovel. It shows that respondents gain physical motor knowledge by doing sand playing activities. They can utilize the function of their fingers in forming sand as physical motor knowledge, namely children's fine motor skills.

In variable 2, the respondent seems to be able to recognize and mention the color and texture of the sand, and then the respondent can explain the process of the work he made. Respondents also seemed to say the various uses of objects used when playing sand activities and completing their work in forming sand ultimately, which is one indicator of early childhood having logical-mathematical knowledge.

In variable 3, respondents seem to cooperate with other friends while doing sand playing activities. This is shown from the social behavior of respondents who can build cooperation to form sand. When collaborating, respondents interact with their playmates, and they communicate with each other so that respondents gain knowledge of the language.

### 2. Respondent B

Based on the observations made to respondent B in variable 1, the respondent seems to be able to carry out indicators of pouring / inserting and forming sand into a bucket by using play equipment. This shows that respondents can gain physical knowledge by doing sand play activities, namely physical fine motor skills.

In variable 2, respondents seem to perform indicators of recognizing and mentioning the color and texture of the created sand. Then, the respondents also seemed to be able to say the various uses of the objects used in playing with sand to completion. This shows that respondents gain analytical mathematical knowledge by doing sand playing activities according to the behavior displayed. Based on the researcher's observations, respondents were able to use logic and take into account the things that would be done while or after doing sand play activities.

In variable 3, respondents seem to perform indicators in collaboration with their friends and help each other when making sand crafts. Respondents are also willing to lend their toys to other friends gladly. This shows that by doing sand play activities, respondents gain social knowledge.

### 3. Respondent C

Based on observations made to respondent C in variable 1, the respondent seems to perform indicators of pouring and forming sand into bottles/buckets/containers, which is done using tools. This shows that the respondents gain physical knowledge by playing with sand, namely physical fine motor skills. Respondents utilize the movement of their hands and fingers in shaping and pouring sand so that it helps to improve their ability to develop fine motor physical abilities.

In variable 2, the respondent seems to recognize and mention the colors and textures and the work he made. This shows that the respondents gain analytical mathematical knowledge by playing with sand, which can be seen from the behavior according to the indicators that appear when children do sand playing activities.

In variable 3, respondents seem to work together and invite their friends while doing sand play activities. Respondents also made communication that made them acquire language knowledge while playing. However, the respondent did not seem willing to share/lend his toys to his other friends; he even complained to the researcher that friends took his toys. This shows that the respondents gain social knowledge by playing with sand even though there are indicators that the respondents have not carried out.

### 4. Respondent D

Based on observations, respondent D in variable one seems to pour and shape sand into buckets/containers with patience and full completion. This shows that the respondents gain physical knowledge by playing with sand, namely physical fine motor skills. He can put the sand into a bucket and make various shapes using his fingers.

In variable 2, the child can recognize and mention the color and texture of the sand. When the researcher asked about the color of the sand, the respondent answered that it was a dark gray color and the respondent mentioned that the texture/shape was smooth like sugar.

Respondents combine things they have just seen/done with experiences they have had before. He told me that he had seen his mother make tea using sugar to make it sweet, he said. In this case, the child displays a critical thinking process as one of the respondent's characteristics showing logical-mathematical knowledge. Then, the respondent was also able to explain the operation of the work he made, such as when making shells, he explained that the sand was first put into the mold and then turned over and turned into bodies. After that, the respondent also mentioned the various uses of the objects/tools used in playing with sand, although the respondent answered that it took a little longer to think. Respondents also did the job thoroughly while playing with the sand. This shows that through sand playing activities, respondents gain logical-mathematical knowledge, which can be seen from the behavior that appears.

In variable 3, the respondent cooperates with his friend while doing sand playing activities, but the respondent does not want to lend his toy to his friend. This shows that respondents acquire social knowledge through sand playing activities. However, one indicator has not appeared; the other indicators appear to have been seen when children do sand play activities.

Table 1. Research Result

No.	Respondent	Knowledge gained	Research Result
			Knowledge description
	Respondent A	Motor (fine) physical knowledge	<ul style="list-style-type: none"> <li>• Able to pour sand into a bucket</li> <li>• Able to shape sand into various shapes using his fingers such as forming mountains, fish, and forts</li> </ul>
		Mathematical logical knowledge	<ul style="list-style-type: none"> <li>• Be able to recognize and name the color and texture of sand</li> <li>• Able to explain the process of the work he made</li> <li>• Be able to name various uses of objects used in playing with sand</li> <li>• Able to do the job thoroughly when playing with sand</li> </ul>
		Social knowledge	<ul style="list-style-type: none"> <li>• Can cooperate with other friends while playing sand</li> <li>• Willing to lend/share toys to friends</li> </ul>
	Respondent B	Motor (fine) physical knowledge	<ul style="list-style-type: none"> <li>• Able to pour sand into a bucket</li> <li>• Able to shape sand into various shapes such as "collapsed buildings" using his fingers</li> </ul>
		Mathematical logical knowledge	<ul style="list-style-type: none"> <li>• Be able to recognize and name the color and texture of sand</li> <li>• Able to explain the process of the work made</li> <li>• Able to name various uses of objects used in playing sand</li> <li>• Not doing the job completely</li> </ul>
		Social knowledge	<ul style="list-style-type: none"> <li>• Able to work together with friends while playing sand</li> <li>• Want to lend toys to other friends</li> </ul>
	Respondent C	Motor (fine) physical knowledge	<ul style="list-style-type: none"> <li>• Able to pour sand into a bucket</li> <li>• Able to shape sand into various shapes such as "collapsed buildings" using his fingers</li> </ul>

Respondent D	Mathematical logical knowledge	<ul style="list-style-type: none"> <li>• Be able to recognize and name the color and texture of sand</li> <li>• Able to explain the process of the work made</li> <li>• Have not been able to name the various uses of objects used in playing sand</li> <li>• Do the job thoroughly</li> </ul>
	Social knowledge	<ul style="list-style-type: none"> <li>• Able to work together with friends while playing sand</li> <li>• Want to lend toys to other friends</li> </ul>
	Motor (fine) physical knowledge	<ul style="list-style-type: none"> <li>• Able to pour sand into a bucket</li> <li>• Able to shape sand into various shapes such as "collapsed buildings" using his fingers</li> </ul>
	Mathematical logical knowledge	<ul style="list-style-type: none"> <li>• Be able to recognize and name the color and texture of sand</li> <li>• Able to explain the process of the work made</li> <li>• Able to name various uses of objects used in playing sand</li> <li>• Not doing the job completely</li> </ul>
	Social knowledge	<ul style="list-style-type: none"> <li>• Able to work together with friends while playing sand</li> <li>• Want to lend toys to other friends</li> </ul>

## Discussion

Regarding the study results, children can maximize the application through the sand play method because real media support it. Children are interested and enthusiastic about participating in learning (Gita, 2016). Creativity makes children more confident and accustomed to initiating their thoughts (Umah & Rakimahwati, 2021). Children's imagination will be more developed with new ideas, one of which is using sand. Children in drawing and shaping activities can use sand. The development of children's creativity through sand games can increase children's imagination, express ideas in children's minds, train children's confidence, stimulate children's growth, cultivate children's creativity in forming new works, and are safe for children to use in playing. In addition, there is a significant effect between sand playing activities and building construction activities (palaces, buildings, and mosques), transferring sand by hand in a relay, putting sand into mineral plastic bottles that have been perforated around them on socio-emotional abilities with aspects of being able to carry out group tasks, patiently waiting for their turn, and obeying the rules of the game (Indrianawati & Hasibuan, 2014).





Respondent A is putting sand in a bucket



Respondent C and D are playing together to form sand

**Picture 1. Sand Play Activities Photos**

## Conclusion

Based on the results and discussion of the research results, it is concluded that by doing sand play activities, children will gain four pieces of knowledge, namely:

1. Physical knowledge of fine motor skills. When the child is playing with the sand, they train the coordination between his fingers and forearms; when digging sand with a shovel and shaping it, the movement teaches hand muscles, eye coordination, and fine motor skills.
2. Logic-Mathematical knowledge. Playing with sand can increase children's understanding of various shapes, sizes, and changes in form to improve children's intelligence.
3. Social knowledge, namely by playing with friends, can make children share, help, ask/offer, and build relationships with their playmates.
4. Knowledge of language. When playing with friends, verbal communication occurs in two directions to enrich the vocabulary and facilitate children's speaking skills.

Based on the conclusions of this study, the researcher suggests several things, as follows: 1) For teachers. Teachers should provide understanding, coordinate with parents when their children play in the sand. When using sand as a playing medium, the teacher should choose clean and safe sand for use by children. Teachers should pay more attention to children's cleanliness and playgrounds after using sand media, 2) For further researchers: Further researchers can follow up this research with various variations and more in-depth literature to get improvements and apply sand media as a medium in playing activities so that children gain diverse knowledge, 3) For parents: Provide support to the school when implementing sand media as a medium in playing activities at school, and not forbid children to play with sand for fear of getting dirty and always to accompany children when children are playing activities.

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