

The Importance of Playing Pattern for Early Childhood Mathematics Learning

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ABSTRACT

This research is motivated by the inability of the child to recognize the pattern characterized by the inability of the child in estimating the next sequence. Early childhood learning must be done through play because children can learn to discover new things. Playing patterns are fun materials and inseparable in early childhood learning. Introducing the concept of pattern to young children is one of the foundations for understanding mathematics. Therefore, early childhood games must be designed creatively. The collection of data in this research is done by collection of library data, reading, recording, and processing of research materials. A research approach be analysed using qualitative descriptive analysis. The study aims to know the proper way to introduce pattern concepts in play activities. It is hoped that children of an early age will be able to recognize the concept of patterns and have the ability to estimate the successive sequences.

Keywords: *Play pattern, mathematic, early childhood.*

1. INTRODUCTION

Early childhood aged 0 to 6 years is a golden period (golden age). At this time, early childhood can develop their potential. Early childhood education is an education that gives unlimited stimulus to the learning process. Law Article 28 Number 20 of 2003 concerning the National Education System in Indonesia in chapter 1, article 1 point 14 states that early childhood education aged 0-6 years is carried out by offering educational stimulation to assist children's growth and development for the next level of education [1]. The focus of early child education on implementation increases the six aspects of child development of moral, social emotional, language, physical motor, cognitive, and art.

Mathematics learning can take place at an early age according to the child's stage and development. This learning can be done by playing so that children can express themselves and create something new. According to Musrikah, the learning that is given to children at an early age is to play because by playing children gain information and pleasure in children. By the method of playing children are not being forced to learn [2]. This is in line with Ahmad's opinion that early childhood learning is done at play [3].

Playing patterns is a game that can develop a child's cognitive abilities. The development of the child is stimulated by enjoyable activities and the child can coordinate problem solving skills. The cognitive

development that marks a person with a variety of interests. In developing cognitive abilities, it is done in various ways, but not eliminating elements playing in learning activities and children will feel drawn to the learning process.

Yuhatriati's research on playing patterns for learning mathematics for early childhood by using play methods with colouring, sticking, and making beaded bracelets. In these activities the child feels happy with the activities made by the researcher. Playing activities are designed to improve their abilities related to the concept of shapes, colours, sizes, and patterns carried out by playing activity patterns. The patterns that are created include repetitive patterns, growth patterns and symmetrical patterns. The findings of this study are consistent with the purpose of this study: Developing play patterns. Model for students aged 5 to 6 years. Based on these results several findings were identified: (1) the assessment instrument can be used in pattern making activities for students aged 5 to 6 years, and (2) a game pattern model designed for students aged 5 to 6 years.

Referring to the Regulation of the Minister of Education and Culture in Indonesia Number 137 Year 2014 aspect of cognitive development includes; (a) learning and problem solving, which children can solve simple problems in their daily lives; (b) logical thinking, that is classifying, the pattern, cause and effect; (c) and symbolic thinking, that is ability of a child to know, to

use the concept of numbers, to mention, to know letters, and to picture their imagination [4].

Playing a pattern on early childhood learning can introduce simple mathematical concepts. In shaping patterns in children can increase their ability to classify, sort, and identify shapes so that children can recognize their basic skills in learning mathematics.

2. DISCUSSION

2.1. Learning Mathematics in Early Childhood Education

Early childhood is a child who has a very high curiosity. Educators can design meaningful games so that they attract children's attention in the learning process. The purpose of learning mathematics is to stimulate children's thinking skills so that children can solve problems in everyday life. The ability to think in early childhood refers to the ability of children not to be the same as the ability to think in adults. According to Santrock, at an early age they are in the preoperational stage, which means that children will bring up their symbolic thoughts through pictures or with words [5]. Piaget argues that the objectives of learning mathematics in early childhood are logico-mathematical learning (learning to think logically) and mathematics by playing and activities that are fun and uncomplicated for early childhood [6]. Learning mathematics for early childhood does not only teach children to count but makes children's understanding to think.

According to the standard of child's developmental achievement in the Regulation of the Ministry of Education and Culture of the Republic of Indonesia Number 137 Year 2014, mathematics is one of the cognitive aspects that must be introduced in early childhood. The concept of learning mathematics in early childhood is carried out according to the stage and development of the child. Teaching mathematics not only learns about numbers but develops logical thinking concepts in children. In general, many public schools that teach early childhood learn to count about numbers.

The introduction of mathematical concepts is at home, in school, and in a child playing environment. Children's love for mathematics can be put to good use. As for the child's liking for mathematics, it is by presenting at the child's stage of development. Learning mathematics can develop children into systematic, logical thinking and mathematics are not just science. Howard Gardner says that this mathematical intelligence is one of eight kinds possessed in early childhood. It is from this age that educators and parents can introduce mathematical concepts [7]. One of the right ways to teach mathematics to children is to package mathematics learning with the right method. This pursuit of mathematics can be done by learning from concrete to

abstract things and presented with various tools, namely in the form of real objects or images. Where educators can use these objects around the child. Children aged 5-6 years are already in the concrete preoperational stage.

Teachers provide more opportunities for children to learn in an appropriate way. For example, exploring, learning from real and real experiences, and meaningful activities. Teachers must be able to adapt, connect and adapt the curriculum at school according to the interests, needs, conditions, and abilities that children have. The study must be designed as exciting and fun and safe as it can be. Educators should be able to incorporate educational elements into the learning process so that the child will be unconsciously aware of many things and develop all aspects of development.

Learning material mathematics is quite difficult in early childhood but learning while playing is the right method and using the right approach will make it much easier for children. Educators will soon be planning and paying attention to the existing learning theories so that children will not be overwhelmed and comfortable in the learning process. Educators must also strategize, methods, understand the child's situation and proper learning. Given that early childhood likes to play, mathematics learning must also involve physical activity and thus acquire learning materials through play.

Math study is a means to develop thinking ability and encourage a child to develop his potential. Math learning can be done with various activities one way or another with educational games where educators can introduce mathematics to early childhood when learning. Risaldi points out that teachers must devise games that are within the educational elements to create such fun learning [8]. One of the games that you introduce to early math is that you play a pattern. By playing patterns children will come to know about shape, colour, size and pattern.

2.2. Playing Patterns for Early Childhood Mathematics Learning

The pattern is the slowdown of events or the recurring sequence. Taylor-Cox says that the sequence of numbers, shape, objects sound, and repeated movements in a similar sequence [9]. We can know that the pattern represents a related order and that children need a basic understanding of order in teaching mathematics. Patterns of things are composed of colour, shape, and size. It is hoped that children will be able to know and pattern in order, after the child has seen the two to three patterns indicated by the teacher and the child can create those patterns according to their creativity. Playing this pattern can be done by starting with simple and more complex.

Indicators in the standard of child's developmental achievement in the Regulation of the Minister of National Education Number. 58 Year 2009 at the age of 5-6 years in the aspect of recognizing patterns, children can predict

the next after seeing the shape of the two patterns [10]. The patterns that a child can build by specific criteria or dimensions such as shape, colour, size, etc.

Based on the characteristics possessed by early childhood, pattern recognition must be gradual and a guideline or reference is needed so that learning is carried out optimally. As for the Sujiono guidelines; (a) that is to begin with a very simple arrangement between two things (AB) and then to the more difficult it can be arranged into a pattern (ABC, AAB, AABB); (b) inserting and including auditory developments in the drafting of such things as clapping, finger games, etc; (c) the next drafting of the easier to the more difficult by introducing, stringing, communicating, and recreation [11].

According to Smith and Price, there are three types of patterns, (a) *repeating patterns* (growing), repeating patterns in the same order. This repetition also occurs in linear (straight) lines, diagonal (circular) shapes, for example in the geometric pattern of rectangles-triangles-circles-squares-triangles-circles and so on; (b) *growing pattern* is that of growing patterns are sequenced by numbers and shapes that fall or rise, of example ordering high beams down to low, from big to smaller, and from large to small; (c) *Symmetrical Pattern*, patterns that reflect and rotate out of shapes or objects. Patterns can be found in leaves and wings of butterflies, and tiles. In this symmetrical pattern, we can also find colours, for example red-yellow-yellow-red (ABBA) based on shapes such as small-large-large-small [12]. In early childhood it is related to sorting activities, using repetitive and developing patterns. Teaching lists such patterns with a simple application of form, colour, movement, taste and sound. This activity can be done by children by copying and continuing the pattern and finding the missing elements in the pattern.

The simple activity of early childhood learning in playing patterns that are repeated and developing patterns is obtained from recurring objects based on colour, shape and size. ABC-ABC repetition patterns based on objects such as red-yellow-green-red-yellow-green etc. Repeated patterns can also be obtained from shapes such as circle-triangle-square-circle-triangle-square etc. So is the pattern of size o-0-O-o-0-O. They can be applied either at school or at home individually or in groups to do things that sort colours, shapes, and sizes. The activity involves colouring, arranging, sticking, and beading. From the experience of a child playing a pattern can sharpen the basic mathematical thought patterns in a child. According to Yuhariati when children play the development pattern occurs when stimulated by fun activities during the learning process [13].

On the sticking activities of educators and parents preparing images that children will be pasted by the child with a pattern, such as a child making ABC-ABC patterns from pictures of animals, such as cat-chicken-bird-cat-chicken-bird etc. Then there was the engagement in

playing and learning the deep pattern of beading. According to Sukardi beading is a technique for making objects out of beads, grains or materials that can be bored so that they can be used and this activity is intended as a playground for children and they can learn to know patterns [14]. The beading is an activity familiar with concepts of patterns in mathematical learning. To play the educators pattern could use concrete materials using coloured, geometric beads and different sizes. It can stimulate and improve the child in knowing patterns, the child can interact directly with the materials to be used in the activity. Children can see holding and participating in activities so that children can easily understand a learning process. The function of the beading activity to train children delicate motor, to promote fantasy, cognitive intelligence, and to develop visualization in determining patterns and colours.

In everyday life a child can also learn about patterns. For example, when children eat a biscuit on each bite, the biscuit becomes smaller. The child also learns the pattern when he pours water into the glass so that more and more, each child adds water to a large bucket of water and becomes more so that the bucket becomes abundant. From here the child will also learn concepts of real additions and deductions and learned in everyday life.

Playing patterns can be done by educators and parents in children's math studies according to the stage of development and potential of early childhood. Teach simple concepts so that children understand in learning and perform activities that make children happy without burdened down in the learning process.

2.3. Benefits of Playing Patterns in Early Childhood

The value pattern play is to increase and sharpen the concentration or power of focus on a child, to increase creativity, to increase the child's ability to compile and put objects in order and measure in patterns. Seefeldt and Wasik say that a child's ability to know patterns will help the child develop the skill of classifying, identifying forms, sorting, and making charts. In line with Smith and Price opinions with children plays the patterns they can explore. In exploration children will learn about regular art, rhythmic music, dynamic action experiences, and children can learn mathematics about the pattern of shapes and mathematics in those activities. In playing patterns children can recognize concepts of order and children will learn to be orderly in everyday life. From the above, there are many benefits of playing patterns in children of an early childhood where children can come to the same mathematical language before and after.

3. CONCLUSION

Math study is a means to develop thinking ability and encourage a child to develop his potential. Early

childhood math lessons in children can be done by playing so that children feel happy and less overwhelmed in the learning process. Educators and parents began introducing simple mathematical concepts and taking advantage of objects around children. Playing a pattern is one of the alternatives to mathematical learning in children of an early childhood and can develop cognitive and other abilities. Educators can re-enact games for fun and meaningful mathematical learning. Such mathematical learning can be adjusted to the child's stage of development and thinking.

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REFERENCES

- [1] President of Republic of Indonesia. Undang Undang No 20 tahun 2003 tentang Sistem Dinas Pendidikan. Indonesia (ID): Department of Education; 2003. 38 p. Report No: 1.
- [2] Musrikah M. Pengajaran matematika pada anak usia dini. *Jurnal Martabat*. 2017;1(1):154-172. Available from: <https://doi.org/10.21274/martabat.2017.1.1.153-174>.
- [3] Nurrahmadani, Ahmad A, Yuharsiati. Memperkenalkan angka pada anak usia dini anak dengan menggunakan kartu angka di PAUD Negeri 2 Banda Aceh. *Jurnal Indonesia Awal Studi Pendidikan Anak*. [Internet]. 2017. [cited 2020];2(2):70-75. Available from: <http://www.jim.unsyiah.ac.id/paud/article/view/5798>.
- [4] Ministry of Education and Culture of the Republic Indonesia. Peraturan menteri pendidikan dan kebudayaan Republik Indonesia Nomor 137 Tahun 2014. Indonesia (ID): Ministry of Education and Culture; 2014. 76 p. Report No: 1668.
- [5] Piaget J, Inhelder B. *Psikologi anak*. Yogyakarta: Pustaka Belajar; 2010. 34p.
- [6] Gardner H. *Multiple intelligences: The theory in practice*. New York: Basic Books; 2003. 431p.
- [7] Risaldy S. *Bermain, bercerita, dan menyanyi*. Jakarta: Luxima; 2014. 176p.
- [8] Cox TH, Blake S. Managing cultural diversity: Implications for organizational competitiveness. *Academy of Management Perspectives*. 1991;5(3):45-56. <https://journals.aom.org/doi/abs/10.5465/ame.1991.4274465>.
- [9] Ministry of Education and Culture of the Republic Indonesia. Peraturan menteri pendidikan dan kebudayaan Republik Indonesia No. 146 Tahun 2014. Indonesia (ID): Ministry of Education and Culture. 68 p. Report No: 1679.
- [10] Sujiono YN, Zainal OR, Tampiomias EL, Rosmala, Satriana M, Rahayu AY, Syamsiatin E. *Metode perkembangan kognitif*. Tangerang Selatan: Universitas Terbuka; 2009. 599p.
- [11] Smith A. *Mathematics in early years education: Third edition*. London: Routledge; 2012. 256p.
- [12] Yuharsiati Y, Yuriansa A. Patterns playing for early childhood education: Mathematics learning for early childhood education. In *Journal of Physics: Conference Series 2018 Sep 1 (Vol. 1088, No. 1, p. 012099)*. IOP Publishing. DOI: 10.1088/1742-6596/1088/1/012099.
- [13] Pamadhi H, Sukardi E. *Seni keterampilan anak*. Jakarta: Universitas Terbuka; 2007. 56p.
- [14] Seefeldt C, Barbara AW, Nasar P. *Pendidikan anak usia dini: Menyiapkan anak usia tiga, empat, dan lima tahun masuk sekolah, edisi kedua*. Jakarta: Indeks; 2008. 466p.