

Research Article

The Cognitive Aspect Development of Matching Numbers Symbols in Children

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ABSTRACT

The learning activity by using the picture and picture, make a matching model uses various goods near the children has an aim to increase the cognitive aspect development of B Group in the Anak Bangsa Marabahan Kindergarten, Marabahan sub-district, Barito Kuala District with 18 students which consist of 6 females and 12 males. The data was collected by observing the teacher, student's activities, and the development of the study results. The result of this study shows that there are various enhancements in the cognitive aspect development in matching numbers with the number symbol through the combination model of *Picture and Picture, Make a Match*. The result of the teacher's activity cycle 1 showed a score of 22, and in cycle IV it got a score of 41. Meanwhile, the students' activity reached up to 50% in cycle 1 and reached 82.63% in cycle IV. The cognitive development result in cycle 1 reached 49.3%, and it reached 91.67% in cycle IV.

Keywords: Cognitive aspect, picture and picture, make a match

Introduction

Early Childhood Education Program (PAUD) is basically education that is organized with the aim of facilitating the growth and development of children as a whole and emphasizes on developing all aspects of the child's personality, by providing stimulation for physical, spiritual (moral and spiritual), motor, cognitive, and cognitive development. The emotional and the social appropriate; and correct them so that children can grow and develop optimally.

Based on the National Education System Law number 20 of 2003, education is interpreted as a conscious effort and the plan shows the atmosphere of learning with the learning process so that participants are actively assessed to develop their potency to have spiritual strength, religious personality, noble moral intelligence, and the necessary skills of him, society, nation, and state (President of the Republic of Indonesia, 2003).

In the direction of maturity every student in a kindergarten requires the opportunity to grow and develop with the support of various facilities and infrastructure such as educational toys, adequate

learning/play spaces, they also need a pleasant playing atmosphere. For learning to run optimally, a planned program is needed that provides a number of learning experiences that can develop the full potential and aspects of child development. In general, kindergarten children often experience problems caused by the limitations of the development of cognitive aspects in matching numbers with number symbols in children aged 5-6 years.

Cognitive or intellectual is a thought process in the form of the ability or power to connect an event with other events and the ability to judge and consider everything that is observed from the world around. Cognitive factors have an important role in children's success in learning because most learning activities are always related to remembering and thinking. Piaget, a cognitive psychology expert figure who views children as active participants in the development process, believes that children should be seen as a scientist who is looking for answers in an attempt to experiment with the world to see what is happening (Mulyasa, 2012). It is done by creating students as a learner who are able to find the knowledge by themselves

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where it will help them to be an autonomic learner and become the all the time learner (Branden, 2015).

To develop cognitive aspects of early childhood, especially in matching numbers with symbol numbers, it is necessary to have activities and learning models that can support success in achieving desired learning outcomes. One is that researchers use a combination of Picture and Picture learning models and Make a Match using objects around the child as cooperative learning strategies to foster interactions that occur between teacher and child, or interactions between children and children.

The use of image media in the learning process of children has been proven to help optimize learning outcomes. The use of pictorial media has been proven to be able to improve the cognitive abilities of kindergartens (Parwati et al., 2013). In the other side, the use of pictures can also increase the students' understanding which has several difficulties in hearing (Pradina & Hastuti, 2017). Learning for childhood students by using the pictured book is also proven able to attract them to learn more where it will increase their interaction while learning something (Reich, et al., 2019). The implementation of the pictured storybook is successfully increased the children's interest and reading ability. (Kraayenoord & Paris, 1996). Besides using a picture in the form of a printed one, the usage of the picture by using the latest technology devices is also proven to make students have more spirit in learning (Strouse et al., 2019).

The application of the combination of these models is expected to have an influence on improving the development of the cognitive aspects of children in matching numbers with symbol numbers, increasing the courage of children to communicate with others. This will create a pleasant social relationship and can develop children's confidence. It will make the development of children's cognitive aspects of the ability to match numbers with symbols can be increased.

Based on the background above, the researchers conducted a class action research entitled "Development of the Cognitive Aspects of Children in Matching Numbers with Numbers Symbols through the Model Picture and Picture, make a Match by Using Objects Around Children of Group B Anak Bangsa Kindergarten, Marabahan sub-District Barito Kuala District.

Material and Methods

This research uses the combination model of Picture and Picture, make a Match; by using objects around the students, and this research also uses the qualitative approach. This research is intended to improve the development of the Cognitive Aspects of Children in Matching Numbers with Numbers Symbols through the Model Picture and Picture, make a Match; by Using Objects around Children of Group B Anak Bangsa Kindergarten, Marabahan District, Barito Kuala Regency.

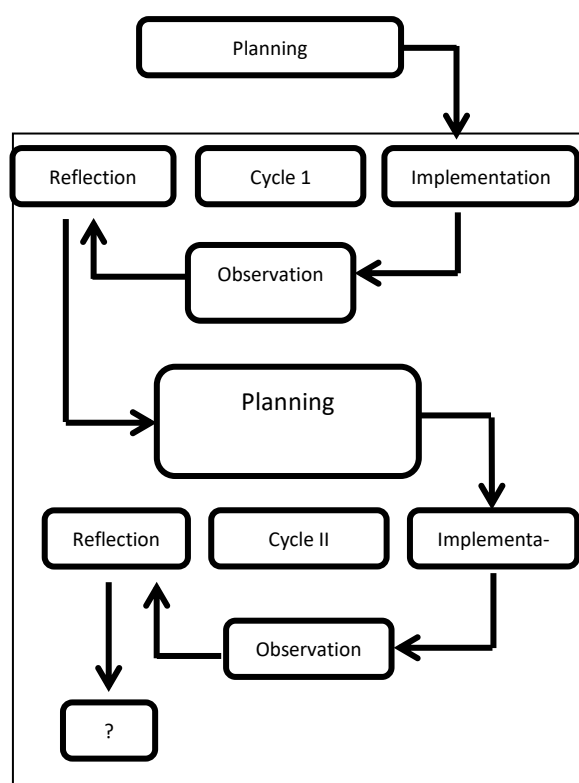


Figure 1. Classroom action research cycle

Sources of data in this study were the group B students of Anak Bangsa Kindergarten, Marabahan District, and Barito Kuala Regency. The data collection techniques used in this study are observation, interviews, and documentation.

The research was carried out on children of group B Anak Bangsa Marabahan Kindergarten, Marabahan District of Barito Kuala Regency. Based on the research permit application letter, the head of the manager of the PG PAUD FKIP Unlam Banjarmasin master program gave a Recommendation Letter on July 30, 2019, under Number 103 / UN8.4.9 / PT.01.06 / 2019. Regarding the

research permit, class action research was conducted on January 7 and 09 2P20 for cycles 1 and II, then on January 10 and 11, 2020 for cycles III and IV.

In this Classroom Action Research, IV cycles are carried out. Each cycle consists of planning, implementing actions, observing results, and reflecting.

Results and Discussion

Based on observations made about the teacher's activities in carrying out the steps of the combination of the "Picture and Picture, Make a Match" model by using objects in the implementation of class actions in cycle 1, a score of 22 is obtained and it is included in the criteria quite well. In cycle II, a score of 28 was obtained and the criteria were good.

Then the third cycle of teacher activity scores 33 with good criteria. In cycle IV the teacher's activity gets a score of 41 and gets very good criteria. It shows the increase in teacher activity in the implementation of learning using a combination of Picture and Picture models; Make a Match by using objects around. It can be done well and meet the desired criteria.

While observations made by observers about children's activities in carrying out the steps of a combination of the Picture and Picture model, make a Match in cycle 1 reaches 50% with quite active criteria, then in Cycle II it reaches 64.93% with active criteria. Then in the third cycle of children's activities reached 76.04% with active criteria and in the fourth cycle of children's activities reached 82.63% with active criteria and had met the indicators of success.

The results of the development of cognitive aspects of cycle 1 children get a percentage of 49.53% with the criteria of Beginning to develop, cycle II gets a percentage of 67.12% with the criteria of Developing as expected, cycle III gets a percentage of 85.64% with very good Developing criteria and cycle IV gets a percentage 91.67% with very well developed criteria. So that conclusions can be drawn from the achievement of children's cognitive development in the learning process through a combination of Picture and Picture models and Make a Match using objects around the child has reached the expected criteria.

Development of children's cognitive abilities in matching numbers with symbol symbols using

Examples Non-Examples Model Talking Stick Model and Model Make A Match in the Group B students of the An-Nur Sungai Punggu Baru Kindergarten was also succeeded in improving the cognitive abilities of children where it is successfully Developing Very Good (Hamidah, 2019).

Based on the findings of the researchers in the research class action conducted on teacher activities, children's activities and the results of the development of cognitive aspects of children carried out as many as 4 cycles consisting of four meetings; The results can be described as follows:

Overall, in the first cycle aspects of the observation of teacher activity contained in the observation sheet carried out obtained a score of 22 with quite good criteria. It shows the activities of teachers must get the corrective steps from deficiencies in previous learning activities.

In cycle II as a whole the activities of the teacher listed on the observation sheet carried scores 28 with good criteria. However, the implementation is still not optimal because there are still several learning steps that get a score of 2. The teacher must strive and try as much as possible in carrying out the steps of activities to achieve the indicators of success that have been set.

Next, the researcher tried again by continuing the third cycle of teacher activity to get a score of 33 with good criteria but still had not reached the specified indicators of success. This can be seen from the 9 activities of teachers who get a score of 3 with good criteria and 2 activities of teachers who get a score of 4 with very good criteria. Furthermore, in cycle IV the teacher's activity obtained a score of 41 with very good criteria. Seen from the 11 activities observed there are only 2 activities that get a score of 3 with good criteria. The rest, there are 9 activities that get a score of 4 with very good criteria. So, it can be concluded that the activities of teachers in managing learning using a combination of models "Picture and Picture, make a Match" using objects around each cycle increases and reaches very good criteria.

The results showed that the activity of teachers in each cycle increased so that it reached very good criteria in cycle IV. This is because almost all aspects observed in teacher activities; for example, the teacher prepares pictures, the teacher prepares surrounding objects, conveys competence, shows objects, gives cards, guides, analyzes material concepts, and makes conclusions, can be

done well. Teacher activities can achieve the desired target. Teachers master the steps of learning. So, the material can be conveyed properly. The availability of the environment as a source of learning and the development and structuring of policies can also be a means and infrastructure that supports the interests of learning and playing in early childhood (Mulyasa, 2012). The teaching and learning activities are undertaken by the teacher to realize the process and good results with strategies that are more in accordance with the conditions and demands of the child's development so that the concepts to be conveyed can be successful and understood well by the child.

The teacher as the spearhead of learning can choose a model. Learning strategies are good enough for successful learning. The teacher's role is to help children gain communication skills, solve problems, and resolve conflicts. Activities can be specifically planned to promote cooperative behavior in the classroom as well as learning centers for kindergarten children. Cooperative learning can make it freer in creating (Suriansyah & Aslamiah, 2011). The cooperative approach is so important for children, especially for shaping the skill to work as a team and to train their skill to interact with their friends (Veldman et al., 2020).

Teachers have to give a chance to children to do something individually or in a team so that children will gain the knowledge and skills (Sujiono, 2012). Based on (Mulyasa, 2012) developing the playing and learning activity is the responsibility of the teachers and children so that teachers can act more as a source of learning. Teachers have to ensure that it can happen as often as possible in their students. In addition, teachers must be alert to capture the momentum of what the children's need is (Susanto, 2011).

The success of a teacher learning system is a decisive component. This is because the teacher is a person who is directly dealing with children. In the learning system, the teacher can act as a learning planner or designer, as an implementer, and or both.

Based on the observation sheet of children's activities and based on the observations of researchers while participating in learning using a combination of Picture and Picture models, Make a Match uses surrounding objects with assessments covering 4 aspects, namely when children

sort surrounding objects into a logical sequence, children answer questions about the picture shown, the child looks for different pairs according to numbers and the child matches objects with numbers. In cycle I it was seen that children's activity reached 50% with the criteria Active enough, and then in cycle II, it reached 64.93% with the active category. While in cycle III it reached 76.04% with the active category and finally in cycle IV it reached 82.63% with the active category, so that the child's activity has reached an indicator of success.

Assignment of Tasks and Model Pictures and Pictures with Concrete Objects Media to Children of Group A PAUD Harapan Kita, Banjar Regency also shows that using a combination of assignment methods and Talking Stick models can increase children's activities by 94% (almost all active children) (Hartati, 2019).

Children's success cannot be separated from the role of the teacher in the implementation of activities in the classroom. The role of early childhood teachers is more as a mentor or facilitator and not a mere transfer of knowledge, because knowledge cannot be transferred from the teacher to the child without the activity of the child himself (Sujiono, 2012).

The teacher develops learning to improve children's success by using the learning principles stated by (Suriansyah & Aslamiah, 2011) that learning is carried out concretely and can be seen by children as introductory, physically, and mentally balanced. In accordance with individual needs, to develop intelligence, contextual, and multi-context, in accordance with children's learning, integrated by using the intention to play and finally learn the pace of life. "Cooperative learning provides opportunities for children's active participation in learning and interactive dialogue. Another factor to support the development of children's learning outcomes is the ability of teachers to deliver learning materials that motivate and can coordinate children in the class (Metroyadi & Mardhiah, 2018). Teachers have a very important role in determining the quality of learning in a school. In addition, teachers who teach children must be able to become facilitators who are able to help students reflect on the learning that has been carried out and be able to determine the right learning strategies for children so that they are always interested in learning (Hmelo-Silver, 2004).

By using a combination of Picture and Picture models, make a Match using surrounding objects, children can make the activities of matching numbers with symbol numbers become concrete and make children become interested during learning activities to take place. The Picture and Picture Model is a learning model that prioritizes the existence of groups by using picture media that is installed or sorted into a logical sequence.

Using colorful drawing media to teach children is able to make them more interested in participating in splitting and in vocabulary learning using pictures also shows positive results (Barani et al., 2010). The use of images in learning can also be done by using the latest technology such as the use of LCD projectors and smartphones. Using technology tools will help students become active and reflective learners (Zhan et al., 2011). In addition, the implementation of technology for children's learning has also been proven to help make learning more interesting so that it can increase student interaction and realize meaningful learning (Gonzalez-Acevedo, 2016). The application of technology in the classroom can help students understand the material presented (Dalle & Ariffin, 2018). But keep in mind that to make learning using technology work optimally, both teachers and students must be prepared and able to use the technology (Osakwe et al., 2017).

Based on the results of observations on the development of cognitive aspects of matching numbers with symbol numbers using a combination of Picture and Picture models, Make a Match with objects around the child. In cycle I obtained a percentage of 49.53%, then in the second cycle increased to 67.12% this in each meeting an increase in the development of cognitive aspects of children, but has not yet reached the indicator of success so that it continues with the next cycle. In cycle III obtained a percentage of 85.64%. Then in the fourth cycle, it is obtained a percentage of 91.67%; so that the classical indicators of success have been achieved can be seen from the number of 18 children who have developed 100%.

Improving the cognitive aspects of students through the use of a combination of Picture and Picture models and Make a Match and objects around the kindergarten children by applying the learning process while playing, so learning can run with fun in children. The use of games as learning strategies has proven to be effective for children's

learning. The game is very good to be used with the aim of increasing student motivation (Yang et al., 2020). By using games, children become more enthusiastic to get involved in the teaching and learning process (Byun & Loh, 2015). For children in the internet age, learning through virtual games has also become a very fun and effective thing (Chen & Chang, 2020). The use of appropriate technology will help increase student learning achievement (Derlina et al., 2018). Furthermore, the learning of foreign languages in children through games has proven to be able to help children improve their understanding of contextual grammar (Lin et al., 2020). Even online games have also been empirically proven to be able to improve students' English vocabulary (Thompson & Gillern, 2020).

In addition, using the game will make students interact and learn with their fellow friends. Strategies that make students learn together and from their peers can make students more active and their interactions in the learning process more effective (Dao, 2020). In addition, by involving friends in the process of learning and evaluation will make students' dependence on teachers also reduced. That means students become autonomous students (Shen et al., 2020). Furthermore, in this era students can obtain information and knowledge independently through interesting programs via satellite TV, internet, and social media (Matijević, 2012).

In fact, through video games with English instruction proved able to make students improve their vocabulary in English independently (Turgut & İrgin, 2009). In optimizing the process of kindergarten children's development towards the right and conducive, kindergarten teachers have an important role and strategy in developing and developing appropriate learning strategies for the level of kindergarten children's development (Suriansyah & Aslamiah, 2011). For this reason, teachers cannot do learning in kindergartens with only one or two methods/strategies but need to have the creativity to make a variety of learning activities strategies. The above explanation relates to the teacher's efforts to improve learning by using a combination of models Make a Match, Picture and Picture, in addition to this activity it allows children to be actively involved in activities using a combination of models Make a Match, Picture, and Picture using objects around.

In this activity, children are directly and actively involved where children are involved physically and psychologically. Seen when the child goes forward, choosing a few picture cards that appear physically involved children while when children think about what the symbol, where the child is directly involved psychologically because children learn to think directly. So that activities can be interpreted using a combination of models Make a Match, Picture and Picture is able to get children directly involved both physically and psychologically. In addition, the use of picture books as a medium of learning and time-limited activities has also proven to be able to help students improve their imagination and creativity.

The role of Early Childhood teachers, in this case, is to assist the growth and development of children in the best way by building children's interest, enthusiasm, and strengths that exist in each

child (Sujiono, 2012). Teachers can help develop children's learning motivation by choosing learning strategies that actively involve children in the learning process (Oga-Baldwin et al., 2017). In addition, always encouraging children and convincing them that they are able to master the material presented can also help students to increase their motivation (Vatankhah & Tanbakooei, 2014). Furthermore, children will enjoy learning if the teacher is able to use games and sing as learning strategies, using visual learning media and the latest technology in the learning process (Ekin & Damar, 2013).

Based on the explanation above, it can be stated that this research can improve the development of cognitive aspects of children in matching numbers with the symbol of numbers in group B Anak Bangsa kindergarten children in Marabahan, Marabahan sub-district, Barito Kuala Regency.

Table 1. The comparison result of the teacher activity observation, children activity, and children development result.

Development	Cycle			
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>
Teachers activity	22	28	33	41
Childrens activity	50%	64,93%	76,04%	82,63%
Result Language development	49,53%	67,12%	85,64%	91,67%

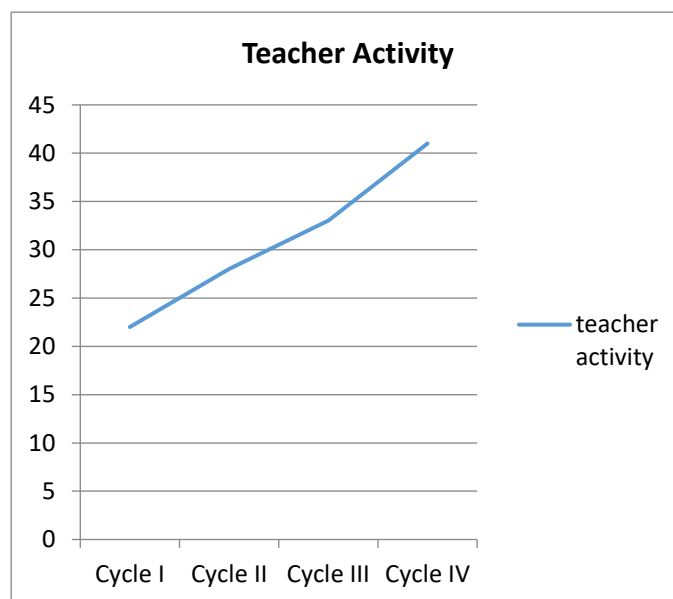


Figure 1. The Teachers' Activity Observation Result

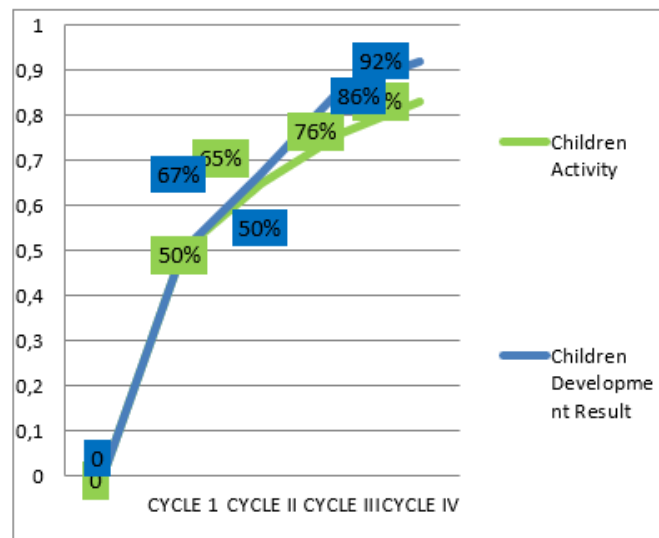


Figure 2. Children activity and children development result

Conclusion and Recommendation

Based on the results of classroom action research, namely about the cognitive development of children in matching numbers with number symbols through the use of a combination of Picture and Picture models, Make a Match by using objects around the group B children of Anak Bangsa Kindergarten, Marabahan District, Barito Kuala Regency, it can be concluded that:

1. Teacher's activities in developing children's cognitive in matching numbers with symbol symbols through a combination of the "Picture and Picture, Make a Match" model by using objects around group B children of Kindergarten Children of the Nation of Marabahan District, Barito Kuala Regency, according to the steps planned steps by obtaining Very Good criteria.
2. Children's activities in cognitive development activities in matching numbers with symbol numbers through a combination of the "Picture and Picture, make a Match" model by using objects around the group B students of the Anak Bangsa Kindergarten Marabahan Sub-district, Barito Kuala District an increase in children's activity with Very Active criteria.
3. There is an increase in children's cognitive development in matching numbers with symbol symbols through a combination of the "Picture and Picture, make a Match" model by using objects around group B children in kindergarten Anak Bangsa Marabahan District. Barito

Kuala Regency can be said to be successful individually, then classically the results of increasing the development of children's cognitive aspects in matching numbers with symbol numbers with Very Good Developing criteria.

Based on the class action research result above it can be concluded that:

1. For teachers, the results of this study can be used as information or reference and consideration in learning activities and media on the success of children's cognitive development through a combination of "Picture and Picture and Make a Match" models using objects around the child.
2. For the Headmaster of a Kindergarten, the results of this study can be used as input and information. Can also be used as consideration for coaching and making policies for children's cognitive development; especially in matching numbers with symbol numbers.
3. For the next researchers, the results of this study can be used as a reference in children's cognitive development activities in matching numbers with symbols through a combination of Picture and Picture Make a Match models using objects around the child.

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