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Abstract

This study discusses the implementation of *puzzle* as a learning media to introduce the concept of color to children in PAUD Munatuan. The main problem of this research is how to introduce the concept of color to children through *puzzle* learning media. The purpose of this study is to figure out how to introduce the concept of color to children through the use of *puzzle* learning media in PAUD Munatuan. This is a classroom action research that consists of 4 stages in each cycle, namely planning, implementation, observation, and reflection. Introducing the concept of color to children using *puzzle* learning media has been the focus of this research and the students of class B in PAUD Munatuan have been involved as research subjects. There have been 14 children selected to take part in this study. The data has been collected through observation and performance. The results of the data calculation show the following average scores: 43.55% for pre-cycle, 54.50% for the first cycle, and 83.80% for the second cycle. Looking at the scores, it can be concluded that in general, these children can recognize colors by using *puzzle* learning media.

Keywords

color concepts, learning media, puzzles

1 Introduction

Indonesian Law No. 20 of 2003 concerning the National Education System, in article 1 paragraph 14 states (Arumsari, Arifin, & Rusnalasari, 2017) that "Early Childhood Education is a coaching effort aimed at children from birth to six years of age which is carried out by providing educational stimuli to assist both physical and spiritual growth and development to prepare children for their further education". Early age or preschool is an effective age to develop the various potentials of children. Playing is the keyword in early childhood education. As we know that children love playing, and so learning is supposed to be done with or while playing to activate all of their senses. Playing provides opportunities for children to express their creativity to feel objects and find things around them in new ways (Suyanto 2005 in Syukur & Tefanai, 2017).

Early childhood is a stage in which an individual is experiencing very rapid growth and development process and is often known as the golden age period (golden era). The golden age period is considered as a very important and precious time. It is even believed as more important than another period of age because children develop all their potentials during this period. In this period, children usually have extraordinary learning ability, and their curiosities as well as built-in desire to learn new things make them active and explorative. Their growth and development can optimally develop if they are stimulated or given stimulation in accordance with the stages of development.

Rasyid, Mansyur, & Suratno (2009) argues that early childhood development is the development of a golden age which is very meaningful for children's future lives if it is developed optimally. The period of growth and development of early childhood must be monitored continuously so that their readiness in skill and ability will quickly be identified, particularly, when it concerns with the development of their basic abilities, such as cognitive, language, and motoric skills as well as the development of other abilities that will build their character for their future lives. The aspect of cognitive development is one of the

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important aspects that must be well-developed to help them think, solve problems, and develop logical skills.

The ability to recognize colors is one aspect of cognitive abilities. This kind of ability is very important for children's brain development because color recognition in the early childhood period can stimulate the sense of sight. Color can also provoke sensitivity to vision. This happens because the colors in objects exposed to sunlight either directly or indirectly can then be seen by the eyes. In addition, to stimulate the sense of sight, color recognition can also increase children's creativity and thinking power which affects their intellectual development and ability to remember.

The Regulation of The Minister No. 58 of 2009 (Kemendiknas, 2009) states that the full scope that must be covered in children's cognitive abilities_ especially, 4-year-old children is to recognize the concept of color. The achievement levels of the development of color recognition for children aged 4 including (1) classifying objects by color; (2) classifying objects into groups of the same color, groups of similar color, or groups paired with 2 variations; (3) recognizing the AB-AB and ABC-ABC color patterns; and (4) sorting objects based on 5 color series. Looking at this regulation, it can be claimed that cognitive ability to recognize colors for children aged 4 must cover those four aspects to make children able to learn general knowledge and science, the concepts of color, size, shape and pattern, the concepts of number and symbol of number and alphabet.

In this study, the researchers conducted initial observations at PAUD Munatuan, in Kupang Regency. It was carried out in class B, which consisted of students aged 4-6. Even though one of the characteristics of a 4-year-old child is that s/he has to be able to recognize the concept of color, these 4-year-old students were not familiar with and could not distinguish colors well. Looking at the result of this observation, the researchers then decided to use interesting media, namely, *puzzle*, as a game to introduce colors to these children.

Playing with *puzzle*s emphasizes on memory because putting *puzzle* pieces together means remembering the whole picture, to be then arranged into a picture of the object. *Puzzle* media is not a new way of teaching. It has been very often used in kindergarten and early childhood education as it contains many good educational values. *Puzzle*s, according to Wojowasito, S. & Poerwadarminta (1980), are problems designed in the form of pictures to stimulate children to think. By using *puzzle*s in this study, it has been expected that children can learn to understand the concept of color well. Many variations and colors of *puzzle*s have been used in this research. The children have been instructed to complete the whole picture *puzzle* by using the trial and error method. The color and shape of the pieces are two things that children have to pay attention to when putting together the whole *puzzle*. It is assumed that playing with *puzzle*s can train children to focus their thoughts because they have to fully concentrate when matching *puzzle* pieces. In addition, this activity can improve children's skills to solve simple problems.

2 Methods

This is a Classroom Action Research type of study. Classroom Action Research is a type of research to examine activity and/or issue that is deliberately raised in the classroom (Arikunto & Suhardjono, 2006). This research is basically a process of controlled investigation to find out and solve learning problems that occur during the teaching-learning process in class. The problem-solving process is then carried out in a-cycle forms with the aim of improving the quality of in-class learning (Syukur & Tefanai, 2017).

This research has been conducted at PAUD Munatuan in Kupang Regency. The result of interviews with class B teachers has shown that many students in this class were unable to identify colors. This has been the main reason for selecting the students in this class as the research sample. This study has been conducted for 2 months, from early August to late September 2019. There have been 14 students of class B PAUD Munatuan taken as the sample.

2.1 Research Procedure

The procedures carried out in this study include Planning, Implementation/Action, Observation, and Reflection (Syukur & Tefanai, 2017). The number of cycles implemented has been determined by the reflection that occurred in each cycle. One learning cycle has consisted of 2 meetings. The implementation of the cycle has been adjusted to the changes achieved. When the results of the cycle have met the Minimum Completion Criteria (KKM) of 80%, the cycle could be stopped. This study has consisted of two cycles, where four stages of activity have been conducted in each cycle.

2.2 Data Collection Technique

The ways to collect data in this study have been in the form of observation and performance.

2.2.1 Observation

Observations have been carried out to observe children's activities during the learning process. Furthermore, they have aimed at looking at children's abilities in identifying and re-expressing the colors that have been taught by the teacher.

2.2.2 Performance

The performance has been conducted in the form of assessing students' work. It has required students to do tasks by asking them to point, name, and distinguish colors on the *puzzle*.

2.3 Research Design

The initial condition of Class B PAUD Munatuan students were that the students had a low level of knowledge about colors. This happened because their home teacher still used conventional methods of learning, like lecturing and explaining, so there was no two-way learning atmosphere between teachers and students. The new teaching and learning process has then been introduced to improve the students' knowledge of colors. The *puzzle* used has been fruit *puzzle* media consisting of apples for red, oranges for orange, bananas for yellow, grapes for purple, and mangoes for green.

2.4 Description of Cycle I

2.4.1 Planning

In the planning stage, the researchers prepared a daily lesson plan (RPPH) and the media to be used in the learning process and it was a fruit *puzzle*.

2.4.2 Implementation/Action

In this stage, the researchers acted as teachers. The teaching and learning procedures were conducted as follows: inviting all students in the class to pray together, asking the students to sing together, Informing the materials to the students, explaining the color of fruits by using *puzzle* media, assigning the students to rematch the color of fruits on a prepared paper, and ending the class session by praying.

2.4.3 Reflection of Cycle I

Based on the implementation stages and the research procedures, both researchers and collaborative teacher carried out a reflection activity to find out problems that still existed. This activity was very useful for the researchers to be able to improve the teaching and learning quality to be implemented in the second cycle.

2.5 Description of Cycle II

Cycle II is usually carried out based on the reflection result of cycle I. If the Minimum Completion Criteria (KKM) has not been achieved in cycle I, then cycle II has to be implemented to help students achieve the KKM. Cycle II is still needed to strengthen the result of cycle I, even if the KKM has been achieved in cycle I. This cycle of this study was also conducted in three stages, as follows:

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2.5.1 Planning

In this stage, the researchers revised and/or improved the daily lesson plan and prepared media to be used in the learning process.

2.5.2 Implementation/Action

The way this stage works was more or less similar to the one in the previous cycle. However, this stage focused more on problems or difficulties identified through the reflection of cycle I.

2.5.3 Reflection of Cycle II

Based on the learning results, both researchers and the collaborative teacher then proceeded to the evaluation stage in order to see the students' scores and the effectiveness of the learning process.

2.6 Data Analysis Technique

The data has been analyzed by using the descriptive analysis technique, while the students' worksheets have been collected and analyzed to find out the average score as well as the percentage of achieved KKM (Arikunto 2006 in Syukur & Tefanai, 2017). The formula used to calculate the average score and the percentage of KKM is as follows:

$$P = \frac{F}{N} \times 100\%$$

Note :
P: Percentage
F: The no of students with scores
N: The total no of students x 100%

3 Description of Pre-cycle's Results

The initial condition of class B's students can be shown by providing the following table:

Table 1 The Results of Pre-Cycle

No	Students' Code	Score	Note
1	AA	60	BT
2	AST	40	BT
3	CL	40	BT
4	DB	60	BT
5	DLI	40	BT
6	FFL	60	BT
7	DL	40	BT
8	IT	60	BT
9	NS	60	BT
10	ST	60	BT
11	STT	60	BT
12	ST	40	BT
13	ZL	40	BT
14	SAS	50	BT
Total		610	
Average		43.55	KKM has not been achieved

Note :
T = Complete   BT = Incomplete

It can be seen from the pre-cycle table that the ability to recognize the colors of the students was still low or did not reach the specified KKM, which was 80%. 43.55% of 14 students were in an incomplete level. The results of pre-cycle observations show that all students did not achieve a complete level, and many of them encountered difficulty in distinguishing between yellow and orange colors. Several students could say the colors of the fruits but still had difficulty in choosing the correct colors on the worksheet.

4 Description of Cycle I's Results

The first cycle was started with the planning stage, followed by implementation/action, observation, and reflection.

4.1 Planning

Based on the results of pre-cycle's reflection, the researchers then decided to focus on the learning method to make students understand the lessons taught by their teacher.

4.2 Implementation/Action

There were 3 steps of learning activity conducted in this stage, as follows: Initial activity: all students were instructed to line up in the front yard before entering the class. After that, the teacher asked one of the students to lead his friends to greet their teacher and pray. Then, the teacher filled out the attendance list. The teacher then invited all students to sing a song which was based on the theme to be taught. The teacher encouraged students to ask questions when they found difficulties. Core activities: the first activity to be done was more or less the same as the previous meetings, which was to prepare learning media in the form of *puzzles*. Then the teacher informed about the theme to be taught, that was *Fruits*, and the learning objectives to be achieved, that was to introduce colors to students. After that, the teacher showed a *puzzle* contained pictures, such as apples, oranges, bananas, grapes, and mangoes, and asked questions related to students' favorite fruits. In this opportunity, students were encouraged to ask questions to be answered by their teacher in the form of story-telling. After telling the story, each student was asked to match each fruit with its color on the worksheet. This activity was carried out by researchers and a collaborative teacher. Closing activity: The teacher carried out question and answer sessions to reinforce students dealing with the material given earlier. The closing song was sung after this session, followed by praying and greetings before they went back home.

4.3 Observation

The activity done in this stage was to record all the events experienced by students when they were working on their worksheets. The situation and condition of students when they were learning had to also be recorded on the observation sheets provided. The teacher told a story to students based on the picture shown, and it was repeated several times to make students understand.

The results of cycle I can be seen in the following table:

Table 2 The Results of Cycle I

No	Students' Code	Score	Note
1	AA	80	T
2	AST	50	BT
3	CL	60	BT
4	DB	50	BT
5	DLI	50	BT
6	FFL	50	BT
7	DL	40	BT
8	IT	53	BT
9	NS	50	BT
10	ST	60	BT
11	STT	60	BT
12	ST	50	BT
13	ZL	60	BT
14	SAS	50	BT
Total		763	
Average		54.50	KKM has not been achieved

Note:
*BT = Incomplete, T= Complete

After calculating the raw data, the results show that the ability of Class B's students to recognize colors was still low or did not reach the KKM yet. It has been found out that only 1 out of 14 students could reach the complete level or it can be said that the KKM in cycle I could only reach 54.50% out of 80%. The results of the observation show that many students still had difficulty in distinguishing between yellow and orange colors. There were some students who were able to guess the colors of the fruits but had difficulty in choosing colors that appeared on the worksheet. This condition was exactly the same as the one in the pre-cycle stage.

4.4 Reflection

The results of cycle I were evaluated by both researchers and collaborative teachers in this evaluation stage. The responses and input from the collaborative teacher as well as students related to the teaching and learning process were well documented to be evaluated. The results of reflection indicate that most students gave positive responses and could participate well in learning activities. This was in contrast with the results of their work, where most of them could not say the color of fruits shown correctly. Looking at this fact, the researchers concluded that the implementation of cycle I was not completed yet and had to be continued to cycle II.

5 Description of Cycle II's Results

This cycle was carried out based on the results of cycle I that had not reached > 80%. The steps were the same as the one conducted in the previous cycle, starting from planning, implementation/action, observation, and reflection.

5.1 Planning

Based on the findings of reflection in cycle I, the researchers, and the collaborative teacher then prepared more copies of *puzzle* media (there was only one copy of media used in pre-cycle and cycle I). There were 4 copies of *puzzle* media provided in this cycle. The 14 students were divided into 3 groups and each group was given one copy. Researchers acted as teachers also had one copy to be able to explain to

students what to do in the learning activities. The improvement of this stage was done based on the reflection of the first cycle which involved the lesson plan, the learning media, the worksheets, and the observation sheets. The improvement aimed to reach the 80% KKM determined by researchers.

5.2 Implementation / Action

There were 3 activities involved in this stage like the previous stage, as follows:

Initial activity: all students were instructed to line up in the front yard before entering the class. After that, the teacher asked one of the students to lead his friends to greet their teacher and pray. Then the teacher filled out the attendance list. The teacher then invited all students to sing a song which was based on the theme to be taught. The teacher encouraged students to ask questions when they found difficulties.

Core Activity: the first activity teachers did was to divide students into 3 groups, and then each group was given a *puzzle* media to be used during the learning process. Teachers then let students know about the theme for that day's lesson, which was, *Fruits and Fruit Colors*. Additionally, the learning objective to be achieved was also informed to students. After that, teachers showed a *puzzle* contained fruit pictures such as apples, oranges, bananas, grapes, and mangoes. Teachers then asked students to point at the fruit(s) they mentioned. Furthermore, students were encouraged to ask questions to be answered by teachers in the form of story-telling based on the pictures. After telling the story, each student was assigned to match each fruit with its color on their worksheets. This activity was conducted by researchers and a collaborative teacher.

Closing activity: Teachers carried out the question and answer session to reinforce students dealing with the material given earlier. The closing song was sung after this session, followed by praying and greetings before they went back home.

5.3 Observation

The activity done in this stage was to record all the events experienced by students when they were working on their worksheets. The situation and condition of students when they were learning had to also be recorded on the observation sheets provided. The teacher told a story to students based on the picture shown, and it was repeated several times to make students understand. The results obtained by researchers related to these students' color literacy through *puzzle* media can be seen in the following table:

Table 3 Results of Cycle II

No	Students' Code	Score	Note
1	AA	90	T
2	AST	88	T
3	CL	85	T
4	DB	82	T
5	DLI	80	T
6	FFL	80	T
7	DL	80	T
8	IT	82	T
9	NS	83	T
10	ST	85	T
11	STT	90	T
12	ST	83	T
13	ZL	83	T
14	SAS	82	T
Total		1.173	
Average		83.80	KKM has been achieved

Note:
*BT = Incomplete, T= Complete

The results of cycle II show that all students achieved KKM (83,80%). This is why; this research does not need to be continued to other cycles.

6 Discussion

Color recognition is very important for children in their early childhood to learn because the concept of color is closely related to the environment around children. Children cannot be separated from the color of the objects around them. The ability to recognize colors is one aspect of cognitive abilities. This ability is very important for children's brain development because color recognition in early childhood can stimulate the sense of sight. There are many benefits that can be obtained from introducing colors to children during their early childhood period, and one of them is to develop their intelligence, related to not only their memorization ability, but also their imaginative and artistic, spatial understanding, cognitive skills, and creative thinking patterns.

There were still many shortcomings in the first cycle, and one of them was many students did not have Good ability in color recognition. This was clearly seen when researchers asked students to point, name, and distinguish colors on the *puzzle* and they could not perform well. There were still many students who were shy, unconfident, and doubtful. This made the learning process using *puzzle* media to be less optimal. It was strengthened by looking at students' results of cycle I where all students were in an incomplete level. From the results of the assessment on students' working sheets and the results of the observations, the total achievement of success in the first cycle was 54.50%. This result still did not reach the success criteria set by the researcher, which was 80%. This made researchers conduct another study in cycle II. In cycle II, certain improvements were made to improve the results. In implementing the use of *puzzle* media, researchers had fully implemented all the steps properly. This can be seen in the results of the students' working sheet and the results of observations. All students were directly involved in the learning process, and they could do the tasks well to achieve the maximum result. Overall, the achievement of success in cycle II was greater than 80%, which was 83.80% and this indicates that cycle II worked really well and no more cycles were needed in this study.

The results of the working and observation sheets indicate that the purpose of this study has been achieved where students have recognized colors well by using *puzzle* media. Students who previously seemed unable to point, name, and distinguish colors could perform better after using *puzzle* media in the teaching and learning process. They could do the tasks assigned by their teachers, such as pointing, naming, and distinguishing colors with a little help from researchers and collaborative teachers. In short, it can be claimed that the achievement standard set in the study, which is > 80%, has been fulfilled properly and this research is considered complete.

7 Conclusion

Based on the results of the findings and discussion above, it can be concluded that the use of *puzzle* media can improve students' understanding of the concept of color in PAUD Munatuan, Kupang Regency. This is proved by looking at the results of the study that there is an increase in the learning results. The pre-cycle completeness reached only 43.55%, then in the first cycle there was an increase in the completeness percentage to 54.50% and in the second cycle, the percentage went up to 83.80%.

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