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IMPROVEMENT OF COGNITIVE ABILITIES THROUGH ACTIVITIES COLOR MIXING AT PGRI SUKADANA KINDERGARTEN

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Abstract
Cognitive development is an important aspect of early childhood education because it is related to children's ability to think, understand, and solve problems. Based on observations conducted at TK PGRI Sukadana, it was found that children's cognitive development had not developed optimally, especially in recognizing colors and understanding the concept of color mixing. This problem was caused by the lack of learning activities that actively involved children and the use of less interesting learning methods. Therefore, this study aimed to determine whether color mixing activities could improve early childhood cognitive development and to describe the process of improving cognitive development through color mixing activities at TK PGRI Sukadana. This study used a Classroom Action Research (CAR) method conducted in two cycles. The research subjects consisted of 26 children in Group B at TK PGRI Sukadana, including 14 boys and 12 girls. Data collection techniques were carried out through observation, documentation, and child development assessment. Data were analyzed using descriptive quantitative and qualitative methods to determine the improvement of children's cognitive development in each cycle. The results of the study showed that color mixing activities were able to improve early childhood cognitive development. This was indicated by the decrease in the percentage of children in the Undeveloped category from 50% in Cycle I to 0% in Cycle II. Children also showed improvement in recognizing colors, distinguishing colors, and understanding that mixing two colors can produce a new color. The process of improving cognitive development occurred because children were actively involved in learning activities through observation, experimentation, and direct exploration. Thus, color mixing activities proved to be effective in improving early childhood cognitive development at TK PGRI Sukadana.

Keywords: cognitive development, early childhood, color mixing, classroom action research.

Abstrak
Perkembangan kognitif merupakan salah satu aspek penting dalam pendidikan anak usia dini karena berkaitan dengan kemampuan anak dalam berpikir, memahami, dan memecahkan masalah. Berdasarkan hasil observasi di TK PGRI Sukadana, ditemukan bahwa perkembangan kognitif anak masih belum berkembang secara optimal, khususnya dalam mengenal warna dan memahami konsep pencampuran warna. Permasalahan tersebut disebabkan oleh kurangnya kegiatan pembelajaran yang melibatkan anak secara aktif dan penggunaan metode pembelajaran yang kurang menarik. Oleh karena itu, penelitian ini bertujuan untuk mengetahui apakah kegiatan pencampuran warna dapat meningkatkan perkembangan kognitif anak usia dini serta mengetahui proses peningkatan perkembangan kognitif melalui kegiatan pencampuran warna di TK PGRI Sukadana. Penelitian ini menggunakan metode Penelitian Tindakan Kelas (PTK) yang dilaksanakan dalam dua siklus. Subjek penelitian berjumlah 26 anak kelompok B di TK PGRI Sukadana yang terdiri dari 14 anak laki-laki dan 12 anak perempuan. Teknik pengumpulan data dilakukan melalui observasi, dokumentasi, dan penilaian perkembangan anak. Analisis data dilakukan secara deskriptif kuantitatif dan kualitatif untuk melihat peningkatan perkembangan kognitif anak

pada setiap siklus penelitian. Hasil penelitian menunjukkan bahwa kegiatan pencampuran warna dapat meningkatkan perkembangan kognitif anak usia dini. Hal tersebut terlihat dari penurunan persentase anak pada kategori Belum Berkembang (BB) dari 50% pada siklus I menjadi 0% pada siklus II. Anak juga mengalami peningkatan dalam kemampuan mengenal warna, membedakan warna, serta memahami bahwa pencampuran dua warna dapat menghasilkan warna baru. Proses peningkatan perkembangan kognitif terjadi karena anak terlibat secara aktif dalam kegiatan pembelajaran melalui pengamatan, percobaan, dan eksplorasi secara langsung. Dengan demikian, kegiatan pencampuran warna dapat meningkatkan perkembangan kognitif anak usia dini di TK PGRI Sukadana.

Kata Kunci: perkembangan kognitif, anak usia dini, pencampuran warna, penelitian tindakan kelas

INTRODUCTION

According to Law Number 20 of 2003, concerning the National Education system in article I point 14 states that Early Childhood Education is defined as an effort for children to have readiness to enter further education. Early Childhood Education is an education that serves children to grow and develop knowledge, attitudes, skills and master a higher level of various aspects of development because children can learn while playing in accordance with the principles of early childhood education. The role of educators that are very important in the development of early childhood cognitive abilities includes the opportunity to provide direct experience to children about various activities that can develop cognitive abilities, such as questions and answers that can encourage children to think and express according to their thoughts (Martini Jamaris, 2010).

Early childhood learning has a very important role in the journey of human life. Through proper learning, early childhood experiences developmental processes in various areas, such as physical development, cognitive development, and development. spiritually, Social

Development, Emotional Development, Mental Development, and Moral Development (E. Mulyasa, 2006). In this case, the cognitive aspects that children have can be improved through various activities, one of which is color mixing activities.

Based on the results of the pre-survey and interviews that have been conducted by researchers at Kindergarten PGRI Sukadana on January 10, 2026 with group B children, data was obtained that 26 children in group B consisting of 14 boys and 12 girls have been found to have several problems related to cognitive development, this can be seen that during learning there are children whose cognitive development has not yet developed, That is, in recognizing colors, mentioning colors, distinguishing colors from each other, grouping objects with different colors, sometimes there are also children who do not know about colors but the child is embarrassed and afraid to ask the teacher. This is also strengthened through the results of interviews conducted by researchers that the ability of children to recognize colors in group B is the activities used by monotonous teachers, such as coloring activities that are often given, and the lack of direct color recognition in children. In other words, the condition of the children's teaching is completely familiar with color but still does not know about the concept of color mixing. For this reason, innovation is needed in coaching learning media aimed at children from birth to the age of 6 years. Through the provision of educational stimuli to help physical and spiritual growth and development, to be effective in improving the quality of early childhood learning. One of them is by conducting a simple experiment with color mixing activities. Therefore, the researcher will

apply color mixing activities to children's cognitive abilities.

METHODS

This researcher uses a Classroom Action Research (PTK) approach with data collection techniques used are interviews, observations, and documentation. This research was carried out in 3 cycles each consisting of 3 meetings. In the 3 cycles, it consists of 4 stages, namely Planning, Implementation Stage, Observation Stage, and Observation. The stages in each cycle can be described as follows:

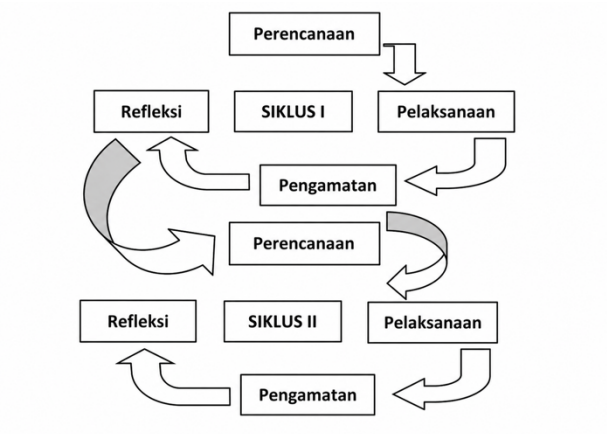

Figure 1. Stages in the Classroom Action Research Cycle

1) Action Plan Preparation Stage

At this stage, the researcher conducts a study of the data collection results that will be used in class action research (PTK), namely:

1) Weekly activity plan (RPPM)
2) Daily Activity Plan (RPPH)
3) The learning material carried out color mixing activities.

4) Assessment format

2) Implementation stage

Actions at this stage are actions of the researcher to carry out actions based on planning. In this study, the implementation of actions was carried out in 2 cycles, namely: Cycle 1 was carried out on Monday, January 26, 2026 and Cycle II was carried out on Monday, February 2, 2026.

The researcher prepares the tools and materials used to carry out color mixing activities. Furthermore, the researcher will explain the activities that will be carried out today and then the researcher will provide an example of how to mix the colors.

3) Observation Stage

At this stage, the researcher assesses cognitive ability. The assessment aspect is that children can know and distinguish various colors (in rainbows, flowers, fruits, animals), recognize the cause and effect of color mixing, and children can convey and retell about when one color is mixed with another, it will change color. Assessments are used to see changes or improvements in cognitive abilities in color mixing activities that have been carried out.

4) Reflection Stage

At this stage, the researcher conducts a study on the results of data collection and conducts a

background study of problems that arise such as children whose development in recognizing colors, mentioning colors, distinguishing colors from each other, grouping objects with different colors, sometimes there are also children who do not know about colors but the child is shy and afraid to ask the teacher. If in the implementation of researchers. At this stage, the researcher assesses cognitive ability. The assessment aspect is that children can know and distinguish various colors (in rainbows, flowers, fruits, animals), recognize the cause and effect of color mixing, and children can convey and retell about when one color is mixed with another, it will change color. Assessments are used to see changes or improvements in cognitive abilities in color mixing activities that have been carried out. If in the implementation of the researcher still encounters problems and the assessment of the child is still considered insufficient, it is necessary to make improvements in the next cycle.

The assessment technique used uses observation guidelines which aim to assess cycles 1, 2 and 3.

RESULTS AND DISCUSSION

Based on the results of a study that has been carried out on 26 children consisting of 12 girls and 14 boys, the development of cognitive abilities of

children in group B of Kindergarten PGRI Sukadana in the implementation of class actions in cycles 1 and 2 has increased. This can be seen in the table as follows:

Table 1: Cycle Assessment Results

Assessment Indicators	Rating	Cycle Assessment Results		
		P1	P2	P3
Children can know and distinguish various colors (rainbows, flowers, fruits, animals, etc.). Know the cause and effect of color mixing. Children can convey and retell about when one color is mixed with another color, they will eat	Not Yet Developed (BB)	6	4	0
	Start Growing (MB)	12	14	15
	Growing Up With Expectations (BSH)	4	4	5
	Very Well Developed (BSH)	4	4	6

Based on these images, it can be analyzed that the results of the study show an increase in early childhood cognitive abilities through color mixing activities carried out during two learning cycles. The research was conducted at Kindergarten PGRI Sukadana with a focus on developing children's ability to recognize colors, understand the color mixing process, and identify the resulting color changes.

The results of the study stated that the actions given succeeded in significantly improving children's cognitive abilities.

The success of the action can be seen from the decrease in the number of children who are in the Undeveloped (BB) category. In the first cycle, there were still around 50% of children in this category, while in the second cycle it decreased to 0%. The data showed that all children experienced skill development after being given color experiment-based learning. These results show that color mixing activities are able to provide concrete learning experiences that are in accordance with the characteristics of early childhood learning.

Based on the table of the results of the first cycle of research, it can be seen that children's cognitive ability to recognize and distinguish colors has improved after the learning action is implemented. In the indicator of children's ability to distinguish various colors through color mixing activities, most children showed development from the Undeveloped (BB) category to Starting to Develop (MB) and Developing According to Expectations (BSH). This condition shows that color experimentation activities are able to provide a concrete learning experience for early childhood. According to Piaget, early childhood is at a preoperational stage, where children learn through real experiences, symbols, and exploration of the surrounding environment. Therefore, learning that involves hands-on activities such as color mixing can help children understand concepts more easily and meaningfully (Pieget, 1952).

Color mixing activities also provide opportunities for children to learn through the process of exploration and discovery. Children not only receive information from teachers, but also conduct experiments directly to find out the color changes that occur. The process is in accordance with the theory of

constructivism which states that knowledge is built by the child through active learning experiences. According to Susanto, early childhood cognitive development will develop optimally if children are given the opportunity to try, observe, and discover the concept of learning for themselves through fun activities (Susanto Ahmad, 2014).

In addition, the results of the study show that children begin to be able to understand simple cause-and-effect relationships when colors are mixed with other colors to produce new colors. This ability is part of the development of logical thinking in early childhood. According to Vygotsky, children's cognitive development is influenced by social interaction and help from the surrounding environment, especially teachers and peers. In the color experiment activity, the teacher provides stimulation in the form of questions, directions, and demonstrations so that children can more easily understand the process of mixing colors gradually (Vygotsky, 1978).

The improvement of children's ability to recognize colors is also influenced by the use of learning media that is interesting and in accordance with the characteristics of early childhood. Children tend to understand the material more easily if it is presented through play activities and concrete visual media. In line with Montessori opinion, children learn effectively through the use of educational game tools that allow children to perform sensory and motor activities directly. Thus, the color media used in this study is able to help children understand the concept of color through real experience.

The results of the study show that experimental learning can increase children's active involvement during the learning process. Children look more enthusiastic, focused, and excited when doing color mixing activities

compared to learning that only uses the lecture method. According to Suyadi, active learning in early childhood is very important because it can stimulate brain development and increase children's curiosity about the surrounding environment (Suyadi, 2013). Exploratory activities such as color experiments are able to provide good stimulation to children's thinking development.

The child's ability to name the results of the new color from the mixing process shows an improvement in the child's communication and language skills. When children explain the results of their experiments, they learn to express their opinions, compose simple sentences, and convey the results of their observations to teachers and friends. Bredekamp and Copple explained that early childhood learning should be integrated so that it can develop all aspects of child development simultaneously, including cognitive, language, social-emotional, and motor aspects (Bredekamp & Copple, 1997).

In addition to improving cognitive abilities, color experiments also help children develop social-emotional skills. When doing activities with friends, children learn to work together, share tools and materials, and wait for their turn. These activities can help children develop positive social attitudes from an early age. According to Hurlock, early childhood social development develops through the experience of interaction with the surrounding environment, especially in play activities with peers (Hurlock, 2012).

The results of the research in cycle I also show that the learning strategies implemented by teachers are in accordance with the principles of early childhood learning, namely learning while playing. Through color experiment play activities, children get a fun learning experience without

feeling depressed. According to Musfiroh, play is the most effective learning method for early childhood because it can increase learning motivation and help children understand concepts naturally (Tadkiroatun, 2014).

The improvement of children's learning outcomes in this study shows that experimental methods can be used as an alternative to simple science learning in early childhood. Children learn to make observations, try, compare results, and draw simple conclusions from the activities carried out. This ability is an important basis in the development of scientific thinking skills from an early age. According to Nugraha, science learning in early childhood aims to foster curiosity, exploratory skills, and simple problem-solving skills through hands-on experience (Nugraha, 2008).

Overall, the results of the study show that color mixing activities have a positive impact on the development of early childhood cognitive abilities. Children become more able to recognize colors, understand color changes, and be active in the learning process. Thus, the use of experimental methods in early childhood learning can be an effective strategy to improve children's thinking skills through concrete and fun learning experiences.

Overall, the results of the study showed that color mixing activities were effectively used to improve early childhood cognitive abilities. The decrease in the percentage of the Undeveloped category from 50% to 0% proves that experimental methods are able to help children understand color concepts better. Thus, color mixing activities can be used as an alternative to simple science learning that is effective and fun for early childhood.

CONCLUSION

From the results of the study, it can be concluded as follows:

1) Color mixing activities at Kindergarten PGRI Sukadana can improve early childhood cognitive development. This increase can be seen from the results of the study which showed that the percentage of children in the Undeveloped (BB) category decreased from 50% in the first cycle to 0% in the second cycle. In addition, children's ability to recognize, distinguish, and understand the color mixing process has improved to reach the categories of Developing As Expected (BSH) and Developing Very Good (BSB). Thus, color mixing activities have proven to be effective in improving early childhood cognitive development at PGRI Sukadana Kindergarten.
2) The process of improving cognitive development through color mixing activities at PGRI Sukadana Kindergarten occurs because children are actively involved in learning activities. Children make observations, try to mix colors, see the color changes that occur, and convey the results of the experiments carried out. These activities help children understand cause-and-effect relationships, practice logical thinking skills, and develop curiosity through concrete and fun learning experiences. Teachers also act as facilitators who provide stimulation, direction, and motivation to children during color mixing activities.

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