



# Beam Center Learning Model Improves Children's Cognitive and Language Development

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## Abstrak

Model pembelajaran yang diterapkan oleh guru dalam pembelajaran yang kurang sesuai akan memengaruhi hasil belajar siswa. Hal ini yang membuat guru harus memperhatikan model pembelajaran yang digunakan. Tujuan penelitian ini yaitu menganalisis model pembelajaran Beam Center terhadap perkembangan kognitif dan bahasa anak usia dini. Jenis penelitian ini menggunakan eksperimen dengan pendekatan kuantitatif. Sampel dalam penelitian ini adalah 100 anak usia dini. Pengumpulan data dilakukan melalui teknik observasi dan dokumentasi. Instrumen yang digunakan dalam mengumpulkan data yaitu kuesioner. Teknik analisis data dalam penelitian ini menggunakan statistik nonparametrik-parametrik, yaitu uji Kruskal Wallis. Hasil penelitian menunjukkan bahwa terdapat pengaruh model pembelajaran Beam Center terhadap perkembangan kognitif anak kelompok A. Secara statistik nilai taraf signifikan  $p = 0,07$  kurang dari 5%. Pengaruh model pembelajaran Beam Center terhadap perkembangan bahasa anak kelompok A, secara statistik nilai taraf signifikan  $p = 0,07$  lebih kecil dari 5%. Dapat disimpulkan bahwa model pembelajaran Beam Center terhadap perkembangan kognitif dan bahasa. Guru dapat menggunakan model pembelajaran Beam Center untuk meningkatkan perkembangan kognitif dan bahasa pada siswa.

**Kata kunci:** Kognitif, Bahasa, Beam Center, Model Pembelajaran

## Abstract

The learning model applied by the teacher in learning that is not suitable will affect student learning outcomes. It makes the teacher must pay attention to the learning model used. This study aims to analyze the beam center learning model on the cognitive and language development of early childhood. This type of research uses an experiment with a quantitative approach. The sample in this study was 100 early childhood. Data were collected through observation and documentation techniques. The instrument used in collecting data is a questionnaire. The data analysis technique in this study used non-parametric-parametric statistics, namely the Kruskal Wallis test. The results showed an effect of the beam center learning model on the cognitive development of group A children. Statistically, the significant level value of  $p = 0.07$  was less than 5%. The effect of the learning beam center model on the language development of group A children is statistically significant level value  $p = 0.07$  less than 5%—development of keywords that the beam center is a learning model on cognitive and language. Teachers can use the beam center learning model to improve cognitive and language development in students.

**Keywords:** Cognitive, Language, Beam Center, Learning Model

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## 1. INTRODUCTION

Early childhood education is education for children's physical and spiritual growth and development outside the family environment before entering primary education (Faizah et al., 2019; Vartiainen & Kumpulainen, 2020). Childhood is also a time of play because educational activities are provided through playing while learning and learning while playing (Alat & Dedeoğlu, 2013; Cheung, SCheung & Kwan, 2021). One of the education leaders stated that education is essential for several reasons as follows; Education is a necessity of life, Education as growth, Education as a social function (Breinholt & Holm, 2020; Dwi et al., 2021). The formation of national character and the quality of human resources is

determined by how to give proper treatment to children as early as possible. In addition, children aged from birth to six years are a critical age for child development (Kazu & İş, 2018; Watini et al., 2020). Stimulation given at this age will affect the rate of growth and development of children as well as attitudes and behavior throughout their life span (Cheung & Yin, 2021; Kusumaningrum & Wahyono, 2020).

Education for early childhood provides various learning experiences such as education for adults and functions to optimize cognitively, motor, language, and spiritual and emotional development (Chien & Hui, 2010; Sutrisno et al., 2021). The whole process of psychosocial stimulation is not limited to classical learning but can take place anywhere and anytime, either done alone or under the supervision and guidance of parents and teachers (Kazu & İş, 2018; Yates & Twigg, 2017). Learning from home is carried out for the principles contained in Circular Letter of the Minister of Education and Culture Number 4 of 2020 concerning the implementation of education policies in the emergency period of the spread of Covid-19. There are 4 Early Childhood learning models during the covid-19 pandemic, namely: Online (on the network), for example, via zoom or using WA, Offline (outside the network) such as picking up children's worksheets, (3) Home visit (home visit in the learning process), Shift or take turns face-to-face (especially for the green zone) (Harahap et al., 2021; Lilawati, 2020; Yulianingsih et al., 2020). Learning activities in early childhood are fun. Therefore, teachers must arouse children's interest in participating in distance learning (online). Teachers must develop exciting and fun learning strategies during the current pandemic (Muhdi & Nurkholis, 2021; Widiastuti et al., 2020).

Based on the researchers' brief observations at Zainuddin Kindergarten, the researchers saw that the center model learning activities in Zainuddin Kindergarten were carried out on a rolling basis. At the beginning of the learning activities, the children were still in their respective classes, but when it was time for the learning center to begin, the children moved to the center that had been previously scheduled. When the learning center model took place, the children were very enthusiastic; it was seen that the children were pleased and ran into the center, which was opened that day. There are six centers opened at Zainuddin Kindergarten, and these centers have center points that have been set in the lesson plan. Children prefer six centers and children less like some. Many children want to play in the beam center from the pre-research observation activities that the researchers did. According to the children, playing activities in the center of blocks was very exciting because the media had many blocks to make all kinds of buildings with different shapes and heights. According to the teacher, children like to play in the beam center because they do not feel like they are learning when they are in the beam center, even though the beam center teaches children a lot about geometric concepts, sharpens children's language skills when explaining to the teacher what buildings they make, and can develop five aspects of development, and multiple intelligences in children. Through the learning center model that is currently being carried out, learning becomes a fun thing because it always pays attention to the uniqueness of each individual.

Knowledge is built within a person through continuous interaction with the environment (Nurlaili, 2018; Wakhid et al., 2019). According to cognitive psychology, learning is seen to understand something by linking new knowledge to existing thinking structures (Kaso et al., 2021; Neuman, 2020; Rovers et al., 2018). Children actively carry out this effort. This activity can be seeking experience, seeking information, solving problems, observing the environment, practicing something to achieve specific goals (Beazley et al., 2018; Irmansyah et al., 2020; Zijlstra et al., 2021). Thus, prior knowledge will determine the success of learning new knowledge information (Kaskens et al., 2020; Tekle-Haimanot et al., 2016). Playing, in addition to developing children's cognitive abilities, also affects all aspects of development in children, one of which is language development (Kiewra & Veselack,

2016; Puspitaningrum et al., 2019). The development of language aspects is closely related to the development of intellectual and social abilities. Communication and language are two essential aspects of human life. Without these two abilities, humans will find it challenging to carry out social interactions (Musyarofah, 2018; Risnawati & Nuraeni, 2019). Language can be defined as a form of social code with a system used to communicate. Language development is one of the basic abilities that children must possess, which consists of several stages according to its development's fundamental abilities and characteristics (Kurnia et al., 2015; Suardi et al., 2019). Based on content standards regarding the level of achievement of children's development in language development, there are three scopes of language development, namely understanding language, expressing language, and language literacy of these three languages, one of the uses of language that often stands out when playing a role in defining language, especially in verbal communication or speaking skills (Nuraeni et al., 2019; Ruiyat et al., 2019). Speaking in playing blocks is a vocabulary that must be by the level of language development of children and communicate orally (Aprinawati, 2017; Ruiyat et al., 2019). Speaking in early childhood is used as a model for learning and making friends and training children's independence to express ideas when playing with blocks. Children will actively speak Indonesian and Javanese. In everyday life, there are often problems in speaking, one of which is the delivery of vocabulary that is not under the pattern of thinking.

Block play activities can improve integrated learning, namely playing blocks to help children discover their surroundings. Make many wishes on them (Rahmatia et al., 2021; Ratna, Farida, 2018). They have to communicate, exchange ideas, make plans, and build with blocks. After completing the building, there was further communication between him and his friend—exchange of ideas and possible changes to development plans. The ability to plan before construction, cooperate, give and receive ideas to expand the world of blocks; is part of children learning to think regularly and express themselves in real terms (Ratna, Farida, 2018; Sartika & Erni Munastiwi, 2019). They also learn the discipline to become cooperative members of their playgroup (Dewi et al., 2019; Rohaeni, 2019). They also learn the discipline to concentrate. Everyone becomes a part of the child in his journey to become an adult. The urgency of learning center beams can train emotional and social skills can be seen from the interaction of children with peers and interactions between children and teachers, children's language development can be seen from how children communicate with friends and teachers during the learning process, while for the development of children's art can increase creativity by providing opportunities for children to explore, play, and discover that in their activities will help them solve problems and learn to understand new skills in the centers. Children can manipulate the objects provided in the centers to develop conversation, play, and learn according to the desired level and steps, such as the center preparation, center for natural materials, the center for arts, role-playing, and the center for beams. The purpose of this study was to analyze the beam center learning model on the cognitive and language development of group A children at Zainuddin Waru Kindergarten, Sidoarjo Regency. It is expected that the beam center learning model can improve cognitive development in children

## 2. METHOD

This type of research is quantitative research. This study uses a quantitative research approach with experimental methods. The model used in this study is a quasi-experimental model with one type of treatment. The variables studied in this study consisted of a variable (Y), namely Y1: Children's cognitive development Y2: Children's language development. Moreover, the independent variable (X) is the beam center learning model (X). The population of this research is group A children aged 4-5 years in Zainuddin Kindergarten,

Waru District, Sidoarjo Regency. The number of samples in this study was 99 children using Simple Random Sampling at Zainuddin Kindergarten, Waru District, Sidoarjo Regency, which collected 99 children. Data were collected through observation and documentation techniques. The research instrument is a beam because it is an instrument of observation of the learning model on children's cognitive growth and language development. The developed instrument will be tested for validity and reliability. Before data analysis, a prerequisite analysis will be carried out using a computer-assisted program SPSS 21.0 For Windows Evaluation Version, namely the Normality Test and Homogeneity Test. After that, an analysis will be carried out to test the hypothesis.

### **3. RESULT AND DISCUSSION**

#### **Result**

Test the validity of variables (1) cognitive development and (2) children's language development in this study using construct validity, which is an observation sheet for children's cognitive development and language development per indicator item, each statement item or validation indicator consulted with experts (judgment experts). ), then the instrument was tested and analyzed using product-moment correlation with the help of the SPSS 23.0 for windows program. The analysis of the test of cognitive development abilities and language development of children is processed with the help of SPSS software. The results of the validity test of each variable will be described as follows  $r_{table} = r_{(n-2; 0.05/2)} = r_{(30-2 = 28; 0.025)} = 0.361$ . The results of the validity test above indicate that  $r_{count} > r_{table}$ . All items of the variable activities of children's cognitive development and language development through the beam center learning model for children aged 4-5 years in Kindergarten Group A at Zainuddin Waru Sidoarjo Kindergarten were declared valid. The value of  $r_{count} > r_{table} (0.05; (30-2=28))$  is 0.361. Thus it can be seen that all statements/indicators on the variable of children's cognitive development and children's language development through the beam center learning model in children aged 4 - 5 years in Kindergarten Group A at Kindergarten Zainuddin Waru Sidoarjo is valid. Reliability relates to the degree of consistency and stability of data or findings. The reliability test results on the variables of cognitive development and language development of children through the beam center learning model resulted in Cronbach's alpha value of more than 0.60, so it can be seen that the variables in this study were reliable.

This study provides treatment (treatment) which is carried out only in the experimental group, two times a week in 1 month (4 weeks), so that the total treatment (treatment) given is eight times. The increase in the average value of the experimental group in the beam center learning model activity is more significant than the control group; this is because the experimental group received treatment in the form of a beam center learning model that has been designed to stimulate cognitive development in children as measured by looking towards the speaker, sitting quietly and facial expressions according to the story being read. The data analysis technique used in this study was the Kruskal Wallis nonparametric-parametric statistical test. The Kruskal Wallis test was used to test the hypothesis, which reads, "The use of the beam center learning model affects the cognitive development of group A children in Zainuddin Kindergarten." The following are the results of the statistical analysis of the Kruskal Wallis test using SPSS 23.0. The results of calculating the output of Kruskal Wallis SPSS show that the significant level value (sig) is less than 0.05. It proves that using the beam center learning model affects the cognitive development of group A children in Zainuddin Kindergarten, so the first hypothesis has been verified.

This study provides treatment (treatment) which is carried out only in the experimental group, two times a week in 1 month (4 weeks), so that the total treatment

(treatment) given is eight times. The average increase in the experimental group is more significant than the control group, this is because the experimental group received treatment in the form of a beam center learning model that has been designed to develop children's language development measured through (1) Children can make scribbles from various geometric shapes; (2) The child can connect the text according to the existing picture, and (3) Children can retell the shape of the building that has been made. A difference test was conducted with Kruskal Wallis to test the second hypothesis, "The use of the central beam learning model affects the language development of group A children in Zainuddin Kindergarten." The results of calculating the output of Kruskal Wallis SPSS show that the significant level value (sig) is less than 0.05. It proves that using the beam center learning model affects the language development of group A children in Zainuddin Kindergarten, so the second hypothesis has been confirmed.

## Discussion

The beam center learning model is through activities of grouping blocks by size, grouping blocks by shape, grouping blocks by color, creating buildings from blocks based on size, creating structures from blocks based on form, and creating buildings from blocks based on color and activities within the scope of children's language development (Rahmatia et al., 2021; Ratna Wahyu Pusari, Farida Nur Utami, 2018). For example, retell what is heard with a limited vocabulary, carry out simple commands according to the rules conveyed, speak according to needs, and ask questions using more than 2 question words: what, why, and how. When the learning center model took place, the children were very enthusiastic (Rohaeni, 2019; Sartika & Erni Munastiwi, 2019). It was seen that the children were delighted and ran into the center which was opening that day. There are six centers opened at Zainuddin Kindergarten, and these centers have center points that have been setting in the lesson plan. Children prefer six centers and children less like some. Many children like to play in the beam center from the pre-research observation activities that the researchers did. According to the children, playing at the beam center was very exciting because there were so many blocks of media that they could make all kinds of buildings with different shapes and heights. According to the teacher, children like to play in the beam center because they do not feel like they are learning. They are in the beam center, even though the beam center teaches children a lot about geometric concepts. It sharpens children's language skills, namely when explaining to the teacher what buildings they make, and can develop five aspects of development and multiple intelligences in children.

Through the learning center model currently being carried out, learning becomes a fun thing because it always pays attention to the uniqueness of each individual (Zeren Özer & Güngör, 2017). The supporting factors for learning activities in the beam center could run smoothly because the media blocks and supporting accessories are many. The child's developmental component emerges. When children create, they mimic what they observe in their daily lives and their imaginations and inventions. Despite their age, each child's capacity to build a structure is undoubtedly not the same. It is dependent on ability and refined motor maturity and parental and teacher stimulus during the time (Nurjani, 2019; Nurjannah, 2018; Wandi & Mayar, 2020). This learning also has an influence on aspects of children's language.

Language development is directing so that children can use and express their thoughts using words. The language ability that develops after listening is the ability to speak (Kurnia et al., 2015; Liyana & Kurniawan, 2019; Suardi et al., 2019). Children need to develop the ability to speak correctly and clearly to interact and be understood by their environment (Khotijah, 2016; Susiani et al., 2013). Children need the experience of communicating with others and doing social interactions. Language development from the stimulus-response point of view, which considers thinking an internal process of language beginning to be obtained



from interactions in the environment. In the theory of behaviorism, children's language development is related to language acquisition which is controlled from outside the child (Rahiem & Widiastuti, 2020; Risnawati & Nuraeni, 2019).

The language development is related to social and communication development. The acquisition of the language comes from the environment in the form of stimuli useful for children's language development (Alam & Lestari, 2020; Suardi et al., 2019). Stimulus (stimulus) from a particular climate strengthens children's language skills. Language development is seen as a progression from random verbal expression to the ability to communicate through the S-R (stimulus-response) linkage principle and the imitation-imitation process. The purpose of children's speech development is to produce sounds verbally. The ability to hear and make verbal sounds is essential for creating sound in speech. Children's speaking ability developed through the pronunciation of different syllables and pronounced them. Furthermore, speaking skills will improve when children can understand new words and ask questions.

#### 4. CONCLUSION

There is an influence of the beam center learning model on cognitive and language development. All developmental processes occur very rapidly in cognitive, motor, social-emotional, and others at an early age. If this development is optimized at an early age, it will impact the ability to act and learn in later periods; early childhood experiences will determine their character when they grow up. The learning environment in this school is designed using a student-centered concept, thus encouraging children to explore what they have and create new things. By applying this center approach, children will learn better if the environment is produced naturally.

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