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# The Influence Of The Application Of The Interactive Powerpoint On The Cognitive Development Of AUD



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### Abstrak

Pembelajaran pada anak usia dini dapat dilakukan dengan memanfaatkan berbagai media pembelajaran, salah satunya dengan memanfaatkan teknologi. Teknologi dalam pembelajaran anak usia dini dapat meningkatkan enam aspek perkembangan yang dimiliki anak, salah satunya kemampuan kognitif. Teknologi pembelajaran power point interaktif yang diterapkan dalam penelitian ini memberikan stimulus perkembangan kognitif sehingga anak dapat memperoleh dan membangun pengetahuan dengan cara menemukan sendiri pengetahuannya. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh pembelajaran dengan media power point interaktif terhadap perkembangan kognitif anak usia dini di TK Aisyiyah 52. Metode penelitian yang digunakan dalam penelitian ini adalah penelitian kuantitatif. Dengan populasi penelitian anak usia 5-6 tahun. Jenis sampel yang digunakan adalah Non-Probabilitas pemilihan sample menggunakan teknik sampling jenuh dengan jumlah populasi sama dengan sampel penelitian berjumlah 20 anak. Data didapatkan melalui hasil nilai pre-test dan post-test. Dari hasil analisis data yang diperoleh bahwa nilai rata-rata untuk pre-test adalah 6 dan nilai rata-rata untuk post-test adalah 12,25, hal ini menandakan bahwa nilai rata-rata *post-test* lebih tinggi dari rata-rata nilai *pre-test*. Sedangkan untuk nilai t hitung dan nilai t-tabel dengan taraf signifikan 5% dan  $N = 20$ . Maka  $H_a$  diterima dan  $H_o$  ditolak, hal ini berarti terdapat pengaruh metode belajar menggunakan media *power point interaktif* terhadap perkembangan kognitif anak usia dini.

### Abstract

Learning in early childhood can be done by utilizing various learning media, one of which is technology. Technology in early childhood learning can improve six aspects of child development, one of which is cognitive abilities. The interactive PowerPoint learning technology applied in this study provides a stimulus for cognitive development so children can acquire and build knowledge by discovering their knowledge. This study aimed to determine the effect of learning with interactive PowerPoint media on the cognitive development of early childhood in TK Aisyiyah 52. The research method used in this study was quantitative research with the study population of children aged 5-6 years. The type of sample used was Non-Probability sample selection using a saturated sampling technique with the same population as the research sample of 20 children. Data were obtained through the results of the pre-test and post-test scores. From the results of data

analysis, it was found that the average score for the pre-test was 6, and the average score for the post-test was 12.25. This indicated that the average post-test score was higher than the average pre-test score for the t-count and t-table values, with a significant level of 5% and N = 20. Then, H<sub>a</sub> was accepted, and H<sub>o</sub> was rejected meaning that method using interactive PowerPoint media had an influence on the cognitive development of early childhood.



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## INTRODUCTION

Early age is not only recognized as a "golden age", but also a key phase and window of opportunity in child development (Ilham & Aidin, 2021). Early childhood goes through various stages during its growth and development. At each stage of growth and development, children get a stimulus from their environment. If the right stimulus is given according to the stages of development, then this development can run smoothly. The development of each child's abilities is different. Physical growth, cognitive, emotional, social, language, moral, and religious development are some of the dimensions of this development (Wiyarni, 2015). Law No. 20 of 2003 on the National Education System for Early Childhood Education (*Pendidikan Anak Usia Dini*) hereinafter abbreviated as PAUD is defined as a coaching effort aimed at children from birth to the age of six, which is carried out through the provision of educational stimuli to help physical and spiritual growth and development so that children are ready to take further education. The period between 0 and 8 years is known as the "golden age". At that time, all children's lives begin, are formed, and are guided wisely and correctly (Pramita, 2010). Cognitive development is one aspect of development that is very important in the stages of child development. Many factors influence children's cognitive development, both internal and external factors.

Based on the initial observations of the researchers at Aisyiyah 52 Kindergarten Surabaya in group B, the researchers saw that cognitive development in some children in group B experienced delays. This could be due to various internal and external things, one of which was the use of learning media that needed to be more diverse and innovative.

Based on the results of these observations, the researchers conducted a study on the effect of using interactive PowerPoint on the cognitive development of group B children at TK Aisyiyah 2 Surabaya.

Along with the times, the tendency for change and innovation in education will continue to grow. These changes include: it is easier to find learning resources, more choices for using and utilizing ICT, and the increasing roles of media and multi-media in learning activities (Budiman, 2017). The development of learning media in kindergarten institutions can be carried out by utilizing technology. This is one of the efforts to direct students to the learning process and interact with other learning resources. Among the many uses of technology-based teaching materials, the researchers used interactive PowerPoint media by utilizing text, audio, video, and multimedia for material enrichment, practicing, and strengthening students in learning a theme. According to Mardi et al. (2007), Microsoft PowerPoint is an application program from Microsoft that can be used to make presentations, both for conducting meetings and planning other activities, including being used as learning media in schools. Therefore, the utilization of learning media in the form of interactive PowerPoint in early childhood can be used as a tool for the teaching and learning process to stimulate children's motivation to learn.

In learning using interactive PowerPoint media in early childhood, the process was done digitally and accessed using a laptop with the help of a projector to display it on a projector screen. The material in the interactive PowerPoint was loaded in a format attractive to children. The research conducted by Aini was related to the use of technology, namely, Digital Pop-Up media which is designed to foster children's motivation to read at TK ABA Sidokelar, through dialogue storybooks and there is audio for children to be able to listen and read because they are designed with dancing. This media has proven to be effective for children. This can be seen from the research results, which state that digital learning media can motivate children to read (Aini, 2021).

## METHODS

This research used a quantitative method. Arikunto (2006) stated that quantitative research is a research approach that uses many numbers, starting from collecting data, interpreting data, and presenting the results. This research was conducted to determine the effect between variables so that statistical analysis can be carried out. The research

design used a quasi-experimental one-group pre-test post-test design, namely research that tries to test hypotheses, predict events in the experimental context, and make generalizations from variable correlations. The population and sample in this study were 20 children in group B at TK Aisyiyah 52 Sukolilo. The type of sample used was Non-Probability sample selection using a saturated sampling technique with the same population size as the research sample. The data analysis technique used was statistical analysis using the t-test and looking for comparisons between the pre-test and post-test to determine the effect of interactive PowerPoint applications on the cognitive development of children aged 5-6 years at TK Aisyiyah 52.

In this study, there were several data collection techniques used by the researchers, namely techniques of 1) interviews, data collection processes, using informants (classroom teachers) who answered questions posed for research purposes, and in quantitative research of interview structured interview was used. 2) Observation, observing students during the learning process to find facts in the field; techniques must be carried out with precision and accuracy to obtain research data, observation practices involve mobilizing several of the researcher's senses, especially sight and hearing to capture phenomena around which can be used as data, and recording scales from the results of the pre-test and post-test. This measurement was carried out using an instrument in the form of a checklist instrument that the researcher had prepared before starting the teaching and learning activities.

## RESULT AND DISCUSSION

In the process of developing the cognitive abilities of group B children at TK Aisyiyah 52, this study was carried out in stages by raising several Animal themes by displaying media images, animations, audio, video, and tests. The learning process began with preparing the RPPH, opening the lesson, and implementing the application of learning using interactive PowerPoint where at the time of application the children look enthusiastic and interactive. In this process, the pre-test lasted for 2 x 30 minutes, the treatment lasted for 2 x 30 minutes, the repetition of material lasted for 2 x 30 minutes, and the post-test lasted for 2 x 30 minutes. The target of this research was that interactive PowerPoint could affect children's cognitive abilities. The activity chosen to develop

children's cognitive abilities was a technology-based learning method with PowerPoint media.

The pre-test activity was carried out by conducting questions and answers related to the various characteristics of wild animals and the assignment in the form of LKA. Activities were carried out using the lecture method by showing animated pictures of animals on PowerPoint. The observations obtained by the researchers during field observation activities showed that the researchers assumed that all students were still unable to complete questions and LKA simply without assistance. However, some children have been able to answer the questions asked. In this study, the Usman conversion was used, and the percentage of data from the questionnaire was obtained based on the calculation of the Gutman scale by determining several assessment criteria.

In the implementation of the action, observations and evaluations were carried out on the children, namely giving a checklist on the symbols: BSB (Very Good Development/*Berkembang Sangat Baik*) = \*\*\*\* if the child shows cognitive development through questions and answers and LKA assignments exceeds the indicator, BSH (Develops According to Expectations/*Berkembang Sesuai Harapan*) = \*\*\* if the child shows cognitive development according to the indicators without guidance. MB (Beginning to Develop/*Mulai Berkembang*) = children able to show their creativity by being guided/directed, and BB (Not Yet Developing/*Belum Berkembang*) = \* if children show cognitive development through interactive PowerPoint media and LKA assignments must always be guided by the teacher from the beginning of learning to the end, so some of the forms of assessment mentioned above are based on several indicators as a reference for assessment.

The scores of the pre-test results obtained by the researchers when carrying out the observation process in the children in group B TK Aisyiyah 52 accompanied by teacher assistance are as follows:

**Table 1 Results of Cognitive Ability of Group B Children before using interactive PowerPoint media (Initial Observation/Pre-Test)**

No.	Name	The targeted skills								Total
		Children could answer questions posed by the teacher regarding the characteristics of wild animals.				Children could understand simple mathematical concepts: addition and subtraction with objects				
		BB	MB	BSH	BSB	BB	MB	BSH	BSB	
		1	2	3	4	1	2	3	4	
	Total			29				32		61
	Mean			1.45				1.6		3.05

Notes:

$$\begin{aligned} \text{Item 1 Mean} &= \frac{\text{Item 1 Total Score}}{\text{The number of students}} \\ &= \frac{29}{20} \\ &= 1.45 \end{aligned}$$

$$\begin{aligned} \text{Item 2 Mean} &= \frac{\text{Item 2 Total Score}}{\text{The number of students}} \\ &= \frac{32}{20} \\ &= 1.6 \end{aligned}$$

After the researchers carried out observation activities related to the initial measurement of the cognitive abilities of group B children, the researchers obtained a score on aspect item 1 of 29 with a mean per subject of 1.45. As for aspects of item 2, the score obtained was 32, with a mean per sample of 1.6. Based on this analysis, the initial results of observing activities related to the cognitive abilities of group B children have a total score of 61, with 20 children as subjects. In this case, the media used as a medium for giving treatment to subjects was interactive PowerPoint. The researchers carried out this treatment activity to find out whether there was an effect of using the media on the cognitive abilities of group B children at TK Aisyiyah 52 Surabaya. Treatment was carried out in stages over 2 days with a duration of 30 minutes each. On this occasion, the children were very interested in the learning methods used with interactive PowerPoint media. This can be seen from the total number of 20 children who could enthusiastically

participate in learning, especially when there was audio, and sing and move songs together.

When the treatment was finished, the post-test was carried out. The post-test scores obtained by the researcher were assisted by the class teacher by observing the activities carried out by the children and adjusted to the observation instrument criteria. This is so to maintain the objectivity of measurement results. The final score obtained by the researchers is as follows:

**Table 2 Results of the Cognitive Ability of Group B Children after the use of interactive PowerPoint media (Initial Observation/Post Test)**

No.	Name	The targeted skills								Total		
		Children could answer questions posed by the teacher regarding the characteristics of wild animals.				Children could understand simple mathematical concepts: addition and subtraction with objects.						
		BB	MB	BSH	BSB	BB	MB	BSH	BSB			
		1	2	3	4	1	2	3	4			
Total				72				7.3				145
Mean				3.6				3.65				7.25

Notes:

$$\begin{aligned} \text{Item 1 Mean} &= \frac{\text{Item 1 Total Score}}{\text{The number of students}} \\ &= \frac{72}{20} \\ &= 3.6 \end{aligned}$$

$$\begin{aligned} \text{Item 2 Mean} &= \frac{\text{Item 2 Total Score}}{\text{The number of students}} \\ &= \frac{73}{20} \\ &= 3.65 \end{aligned}$$

The data collected by researchers came from initial observations and post-treatment observations of the development of cognitive abilities in group B children at TK Aisyiyah 52, namely:

**Tabel 3 Results of Pretest and Posttest Score Analysis**

No.	Pretest	Posttest	d (posttest-pretest)	Xd (d-MD)	X2d (xd^2)
1	2	7	6	-0.25	0.0625
2	2	7	6	-0.25	0.0625
3	2	8	5	-1.25	1.5625
4	2	7	6	-0.25	0.0625
5	4	7	6	-0.25	0.0625
6	3	7	6	-0.25	0.0625
7	4	7	6	-0.25	0.0625
8	4	7	6	-0.25	0.0625
9	3	8	7	0.75	0.5625
10	3	8	6	-0.25	0.0625
11	3	7	7	0.75	0.5625
12	4	7	7	0.75	0.5625
13	3	7	7	0.75	0.5625
14	3	7	7	0.75	0.5625
15	2	7	7	0.75	0.5625
16	2	7	6	-0.25	0.0625
17	3	8	7	0.75	0.5625
18	4	8	6	-0.25	0.0625
19	4	8	6	-0.25	0.0625
20	4	8	5	-1.25	1.5625
<b>Mean</b>	6	12.25	6.25		
<b>Total</b>				0	7.75
<b>t count</b>	<b>2.10239</b>				
<b>t table</b>	<b>2.18822</b>				

After that, to find out the results of the development of children's cognitive abilities at TK Aisyiyah 52, the researchers looked at the differences in scores before and after treatment (pretest and posttest). To determine the results of the trial using a one-group design with a pre-test and post-test the following formula is used: (Arikunto, 2002).

$$t = \frac{Md}{\sqrt{\frac{\sum x^2}{N(N-1)}}}$$

Based on the results of the calculations, the development of early childhood cognitive abilities can be seen before and after treatment: the average score for the pretest was 1.6 and the average post-test score was 3.65. This means the post-test average score was greater than the pre-test average score. Meanwhile, the calculated t value was 2.30339, and the t-table value was 2.18822 with a significant level of 5% and N = 20. This means that the calculated t value was greater than the t-table value indicating that learning by utilizing interactive PowerPoint media was effective because it could influence the development of children's cognitive abilities at Aisyiyah Kindergarten 52.

The results of this study indicated that the use of interactive PowerPoint media in the learning process affected the cognitive abilities of TK Aisyiyah 52 children. This aligns with Hendri's thinking (see Ilham & Aidin, 2021), in which the human brain is divided into two hemispheres: the right brain and left. The right brain is involved in the formation of emotions, creativity, music, imagination, and fantasy or imagination, as well as long-term memory in the process of remembering. While the left brain functions more in areas such as logic, arithmetic, numbers, language, and writing. The left brain has a tendency to have short-term memory in terms of remembering.

The researchers' initial hypothesis assumed that interactive PowerPoint media could influence children's cognitive development. Then, this was proven by applying treatments and tests, which were then processed in the form of data where interactive PowerPoint was proven to have a significant effect on the cognitive development of group B children at TK Aisyiyah 52. Today's modern life is certainly inseparable from the influence of scientific and technological developments marked by advances in information and communication technology (ICT), and other technological developments in various fields that are running so rapidly along with the times. Technological developments certainly influence various sectors from education to the economy. Technological progress can be a benchmark for the progress of a country. Therefore, every country competes in advancing technology so as to avoid being left behind. The current rapid development of technology can not only be felt by adults but also by young children. Therefore, it is necessary to introduce technology to children wisely, one of which is through learning. Using information and communication technology (ICT) in

learning in PAUD is very helpful in the teaching and learning process in class (Isna, 2019). Aspects of early childhood development according to the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 137 of 2013 are (1) Religious and moral values, (2) Physical-Motoric, (3) Cognitive, (4) Language, (5) Social-Emotional, and (6) Art. Among these developmental aspects in this study, the researchers focused on the cognitive development of group B children, where cognitive function is a predictor that has a major influence on children's life outcomes in adulthood (Nweze et al., 2023). There are many ways that educators can use to stimulate children's cognitive development, one of which is by using interactive PowerPoint that have been modified according to the learning objectives. PowerPoint in the early childhood learning process in practice can be used to teach new ideas and concepts to students (Hashemi et al., 2012). The development of PowerPoint media in the learning process aims to help teachers improve the cognitive development of students so that it can make it easier for students to capture the messages that will be conveyed in learning accompanied by a video. The use of characters is adapted to the characteristics of early childhood, one of which is the use of animation that is attractive to children, including videos, radio/audio, still images, visual symbols, and verbal symbols. In other words, children can be interested in the use of pictures, both audio and visual symbols.

In a study by Dewi in 2017, it was stated that there was an influence on the ability to recognize number symbols in group A1 RA Ath-Thooriq children using the PowerPoint media-assisted singing method. This was evidenced by the average data results, where the average value of the experimental group was higher than the control group. The use of PowerPoint as a learning medium certainly has advantages and disadvantages. The advantages of using PowerPoint to improve cognitive abilities are as follows: 1) It attracts more children's attention, and 2) It can arouse children's curiosity and broaden children's knowledge. Disadvantages of using PowerPoint to improve cognitive abilities include 1) Limited technical ability of teachers using PowerPoint, 2) Adequate devices such as projector screens are needed and require a large enough electric current, and 3) Media can only be used with laptops/PCs. At this time, PowerPoint is one of the educational tools that can be used to teach and deliver material in class, although PowerPoint is developed for presentations, this also has benefits for the process of teaching and learning in class. Its application to the teaching and learning process must be adjusted according to the

portion to communicate information aimed at students and be used wisely to improve teaching sessions in class. Interactive PowerPoint media are expected to be used as interesting learning media by teachers, which can be developed according to learning objectives and learning themes, and made creatively and innovatively by teachers to attract and increase children's interest in the process of playing while learning for early childhood.

## CONCLUSION

Based on the research analysis results, technology-based learning methods using interactive PowerPoint media were very effective because they could influence the development of children's cognitive abilities in TK Aisyiyah 52. This can be seen from how the treatment was given to children during the learning process. Children look enthusiastic about the interactive PowerPoint media used because the interactive PowerPoint media used was made interestingly accompanied by interactive animations, audio, and video, which can attract children's attention and can increase children's focus so that during questions and answers, children can answer questions correctly. Children can work on LKA with assessment indicators related to cognitive development well. This can be seen from the pre-test results where 62.5% of children got BSB (Very Good Development) results and 37.5% got BSH (Developing According to Expectations) results. It can be concluded that technology-based learning methods using interactive PowerPoint media have a significant effect on the cognitive abilities of group B children at TK Aisyiyah 52 Sukolilo, where there is a significant influence on the application of technology-based learning methods using interactive PowerPoint media. The use of interactive PowerPoint is expected to support the learning process, introduce students to technology, and help teachers to be more creative and innovative in developing learning media.

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