

Research Article

The Effect of Using Augmented Reality-Based Mobile Thematic Kindergarten Teaching Materials to Improve Students' Soft Motor Skills

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ORCIDEem Kurniasih: <https://orcid.org/0000-0002-7310-3794>**Abstract.**

Based on research in the first year of the development of AR-based kindergarten thematic learning media in NASIMA Semarang Kindergarten and Kekancan Mukti Semarang Kindergarten, it shows that more than 95% of the teachers are interested in using M-BAT products in thematic learning at school and the products have been validated by material and media experts. They are suitable for use to ensure that M-BAT thematic kindergarten product can be used as a learning media supplement in all kindergarten schools, an expanded test was carried out in other kindergartens in the Semarang city area with the hope that the M-BAT product is suitable for use by teachers and students in improving their abilities students' soft motor skills, the research method used is the ADDIE R & D model (Analysis, Design, Development, Implementation, and Evaluation) implemented for 2 years. This second year focuses on the implementation and evaluation steps that have been carried out with expanded tests at Kindergarten Harapan Bunda Semarang and Kindergarten PGRI 35 Semarang, with research results showing that using M-BAT affects students' fine motor skills by 84.9%. In contrast, 15.1% of learning achievement is influenced by other variables outside of the independent variables in this study.

Keywords: the effect, augmented reality, thematic book, kindergarten, soft motor skills

1. Introduction

In supporting learning during the pandemic at both school and college levels. There are many textbooks circulating on the market, but they are not yet in accordance with the demands era, for example, textbooks in kindergarten thematic learning, so far textbooks have been used available only in the form of a printed version and is not linked to technological applications renewable [1], from this reality, teachers must be able to package and create textbooks that are interesting to children and able to improve children's literacy skills, Kindergarten schools in the city of Semarang and surrounding areas, both public and private, are not yet capable provides augmented reality-based

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thematic kindergarten textbooks that are capable of displaying 3D objects on every page of the textbook, therefore it is necessary to create a thematic kindergarten textbook based on augmented reality which can improve children's ability to understand measurable thematic material based on interviews with several kindergarten teachers in the city Semarang, both public and private, resulted in the fact that almost 100% of kindergarten schools in the city Semarang still uses thematic kindergarten textbooks which do not have a touch of technology renewables such as augmented reality, virtual reality, other renewable software applications, This is a significant finding for the development of capable textbooks accommodate these problems [2].

There are several factors that cause low grade 1 kindergarten thematic scores such as 1) the teacher's textbooks are less interesting, There are no books based on augmented reality that are capable of displaying three-dimensional objects, 2) Children's weak skills in using smartphones, 3) Teachers who teach animal material does not use renewable 3D-based media, 4) children do not accustomed to using mobile-based games. 5) children have difficulty in improving fine motor skills in recognizing animal material, 6) Kindergarten teachers Harapan Bunda Semarang are 100% interested in using VAR-based educational games to support the process of learning [3]. This is due the experiences or memories of that period will greatly influence the person in later years next, while according to Piaget the age is zero to six years includes two periods of cognitive development, namely the sensorimotor phase (0-2 years) where Children's knowledge is obtained through physical interaction, either with people or objects and preoperational phase (2-6 years) where children begin to use symbols for represent the world of the environment cognitively, so media is needed learning that is able to display these symbols according to the level of thinking of kindergarten children [4], then using augmented reality-based media increases kindergarten students' learning motivation [5].

According to the results of observations made by researchers at TUNAS Pedurungan Kindergarten Semarang and PGRI Kindergarten 37 Semarang which shows that the kindergarten thematic learning process is still less active and less interesting, this is the absence of learning media used by teachers so that children become bored quickly. There is no teaching and learning interaction in the classroom regardless of the influence of the media used by the teacher in delivering the teaching material Smartphones are growing rapidly at the moment. The existence of technology, especially smartphones which is now increasingly developing must be addressed wisely. The phenomenon of height The number of smartphone users is certainly a challenge and opportunity in the world of education [6]. This challenge is misused for negative things. Besides

being a challenge, the existence of smartphones also brings great opportunities to develop technology that is useful in the field of education. One of the benefits that can be taken from the existence of this technology is by using it as an effective, creative, and educational learning media [7], so that educational application media can continue to be developed, one of which is Augmented Reality (AR) technology. Based on this background, researchers have developed an Android-based thematic learning media using Augmented Reality Book.

2. Method

The research method used is the ADDIE development model through five stages namely, Analysis, Design, Development, Implementation and Evaluation. Test of Expanding M-BAT (Mobile Thematic Teaching Materials) Kindergarten Products based on Augmented Reality at TKIT Harapan Bunda Semarang and TK PGRI 35 Semarang. In the learning process using Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) media at TKIT Harapan Bunda Semarang and TK PGRI 35 Semarang

3. Result and Discussion

Test of Expanding M-BAT (Mobile Thematic Teaching Materials) Kindergarten Products Based on Augmented Reality at TKIT Harapan Bunda Semarang and TK PGRI 35 Semarang. In the learning process using Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) media at TKIT Harapan Bunda Semarang and TK PGRI 35 Semarang has been carried out simultaneously with the following steps:

1. Choosing an experimental class by random sampling, namely Kindergarten A class, to be subjected to face-to-face learning
2. The Augmented Reality Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) application includes 3 chapters which have been revised by the tebased on expert input, student and teacher respondents in the second year including material My Family, My Country, Myself which is packaged in the form of a mobile and computer-based APK.
3. Students are required to use Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) in classroom learning

4. Assessments are carried out at the end of each Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) learning material
5. Then students and teachers filled out questionnaire responses regarding the learning process using Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials).

The expanded test was carried out at TKIT Harapan Bunda Semarang by taking the TK A-1 class at TKIT Harapan Bunda Semarang as the experimental class and the TK A-2 class at TK PGRI 35 Semarang as the control class.

The effect of Using Augmented Reality-Based Mobile Thematic Kindergarten Teaching Materials to Improve Students' Soft Motor Skills was tested using an experimental design, namely Post-test Only Control Design. In this design, there are two groups, namely the experimental group and the control group. This experimental design is used to compare student learning achievement between the experimental group and the control group with the hope that the experimental group's achievement will be better than the control group.

In this research, the influence test was carried out using a simple linear regression test with the help of the SPSS program. This test aims to determine the effect of using Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) media on student learning achievement in the form of fine motor skills. From the SPSS output results, the following results were obtained.

TABLE 1: Regression with coefficient.

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	62.499	20.245		3.087	.005
	Mobile thematic textbook	.262	.240	.222	1.091	.287

a. Dependent Variable: soft motoric skill

From the coefficients table above, constant values and simple regression coefficient values for the independent variables are obtained. From this value, a simple regression value can be found which is expressed in the following equation.

$$Y=62.499+(0.262)X$$

From this equation, the results of the simple regression equation mean that:

A constant of 20,245, if the M-BAT (Mobile Thematic Teaching Materials) variable for Augmented Reality Based Kindergarten is assumed to be constant, then learning achievement will increase by 62,499.

The regression coefficient value for the Augmented Reality Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) variable in the regression equation shows a positive value of 0.262, which means that if the Augmented Reality Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) variable increases by 1%, then achievement learning will increase by 0.262%.

From the results of the regression coefficient testing, it was concluded that the use of M-BAT (Mobile Thematic Teaching Materials) for Kindergarten Based on Augmented Reality had a positive effect on learning achievement at TKIT Harapan Bunda Semarang.

This is reinforced by the fact that the letter recognition learning application using augmented reality technology can increase children’s learning motivation [8], then by creating an Interactive Learning Media Application for Introduction to Vegetables for Children Based on Augmented Reality, children understand more about vegetables up to 90 percent [9], both of which are strengthened by the relationship between mother’s knowledge about child development and the development of gross and fine motor skills in children aged 4-5 years at Kindergarten Aisyiyah Bustanul Athfal 7 Semarang [10], where AR media is able to improve children’s fine motor skills, then there is a positive influence on the use of finger painting. on the development of fine motor skills of preschool children at Kindergarten Sartika 1 genuk, Babat Lamongan sub-district by making children more active in practicing [11].

To find out how much influence the independent variable has on the dependent variable (learning achievement) can be seen in the R square value contained in the SPSS output as follows.

TABLE 2: Model Regression.

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate
1	.222 ^a	.849	.818	9.998

a. Predictors: (Constant), Mobile thematic textbook

From the Model Summary table 2, it is found that the R Square value is 0.849 = 84.9%. This value means that the influence of Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) media on learning achievement is 84.9%, while 15.1% of learning achievement is influenced by other variables outside of the independent variables in this research. By using thematic-based pop-up book media, it is able to increase the verbal-linguistic intelligence of children aged 4-5 years, meaning

with interesting learning media for use in class [12], then by implementing Thematic Learning with Your Own Theme in Kindergarten [13], it makes children more independent in learning, then with Evaluation of using VAR (Virtual Augmented Reality) based educational games in Islamic kindergartens in Semarang City [14], making children more creative and active by using educational games, then using digital media in early childhood can improve children's fine motor skills significantly reaching 90 percent [15]

The expanded test documentation at TKIT Harapan Bunda Semarang can be seen in the following image.



Figure 1: Expanded test of Augmented Reality-Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) products at TKIT Harapan Bunda Semarang.

4. Conclusion

This second year focuses on implementation and evaluation steps which have been carried out with expanded tests at Kindergarten Harapan Bunda Semarang and Kindergarten PGRI 35 Semarang, with research results showing that using M-BAT affects students' fine motor skills by 84.9%. In contrast, 15.1% of learning achievement is influenced by other variables outside of the independent variables in this study. This shows that the Augmented Reality Based Kindergarten M-BAT (Mobile Thematic Teaching Materials) product at TKIT Harapan Bunda Semarang is very suitable to be used as a supplement in kindergarten learning.

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