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The Impact of Animal AR 3D Safari Learning Media Based on Augmented Reality Technology on English Learning for 5-6 Year Old Children at Naura Nashyefa Kindergarten, Maros Regency

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Abstrak

Penelitian ini bertujuan untuk mengetahui pengaruh media pembelajaran *Animal* AR 3D Safari Berbasis Teknologi *Augmented Reality* terhadap kemampuan bahasa Inggris anak usia 5–6 tahun di TK Naura Nahyefa. Metode penelitian yang digunakan adalah kuantitatif dengan jenis penelitian *quasi eksperimental design*. Desain penelitian ini menggunakan *nonequivalent control group design*. Populasi pada penelitian ini terdiri dari 30 anak, dengan teknik pengambilan sampel menggunkan sampling jenuh sehingga sampel penelitian ini terdiri dari 30 anak, yang dibagi menjadi dua kelompok yaitu 15 anak sebagai kelompok eksperimen dan 15 anak sebagai kelompok kontrol. Teknik pengumpulan data berupa observasi, tes perlakuan dan dokumentasi dengan indikator kemampuan bahasa Inggris mencakup menyebutkan kembali kosa kata bahasa Inggris, meyebutkan kata dalam bahasa Inggris, dan mengartikan kosa kata bahasa Inggris . Teknik analisis data yang digunakan adalah analisis statistik deskriptif dan analisis statistik non parametrik dengan menggunakan Uji *Wilcoxon Sign Rank Test*. Hasil analisis data yang diperoleh *Asym* (2-*tailed*) = 0,001 < 0,05 artinya H1 diterima dan H0 ditolak dengan demikian kemampuan bahasa Inggris pada kelas eksperimen lebih meningkat dari pada kelas kontrol, ini menjelaskan bahwa ada pengaruh yang signifikan dari penggunaan media pembelajaran *Animal* AR 3D Safari Berbasis Teknologi *Augmented Reality* terhadap kemampuan bahasa Inggris pada anak usia 5-6 tahun di TK Naura Nashyefa.

Abstract

This study aims to determine the effect of Animal AR 3D Safari learning media based on Augmented Reality Technology on the English language skills of children aged 5-6 years at Naura Nahyefa Kindergarten. The research method used is quantitative with a quasi-experimental design research type. This research design uses nonequivalent control group design. The population in this study

consisted of 30 children, with a sampling technique using saturated sampling so that the sample of this study consisted of 30 children, who were divided into two groups, namely 15 children as the experimental group and 15 children as the control group. Data collection techniques in the form of observation, treatment tests and documentation with English language ability indicators including re-mentioning English vocabulary, mentioning words in English, and interpreting English vocabulary. The data analysis technique used is descriptive statistical analysis and non-parametric statistical analysis using the Wilcoxon Sign Rank Test. The results of the data analysis obtained Asym (2-tailed) = 0.001 < 0.05 means that H1 is accepted and H0 is rejected, thus the English language skills in the experimental class are more improved than in the control class, this explains that there is a significant influence of the use of Animal AR 3D Safari learning media Based on Augmented Reality Technology on English language skills in children aged 5-6 years at Naura Nashyefa Kindergarten.

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INTRODUCTION

Early childhood education is an important foundation in shaping children's cognitive, language, social, and emotional development. One very important aspect of development that should be stimulated from an early age is language ability, including the introduction of foreign languages such as English. Learning English from an early age is believed to accelerate language acquisition, enhance cognitive abilities, and broaden children's perspectives in facing the era of globalization. (Kholilullah dkk., 2020).

However, the implementation of English language learning in Early Childhood Education institutions (PAUD) still faces several challenges, especially in terms of the limited availability of engaging learning media that is suitable for children's developmental characteristics. Young children tend to get bored quickly and have a short attention span, which requires an interactive, fun, and meaningful learning approach. (Mutia & Na'imah, 2020).

In this era of globalization, technological advancements have opened new opportunities in the field of education, one of which is through the use of Augmented Reality (AR) technology as a learning medium. AR allows children to interact directly with virtual objects in a real environment, making the learning experience more concrete,

visual, and engaging (Saidah, 2020). One potential AR-based learning media for use in early childhood English learning is the Animal AR 3D Safari application.

This application presents 3D animal models, complete with names and sounds in English, and is operated through scanning flashcards. These features are expected to help children recognize English vocabulary, name animals according to images, and understand the meanings of those words.

This research aims to test the extent of the influence of the Animal AR 3D Safari learning media based on Augmented Reality technology on the English language skills of children aged 5–6 years. Referring to indicators of recalling vocabulary, naming words according to images, and interpreting several words in English, this research is expected to contribute to the innovation of learning media in early childhood education and encourage the use of child-friendly interactive technology in the foreign language learning process.

LITERATURE REVIEWS

Learning media is a means or tool used in the teaching and learning process to convey educational messages in a way that is easier for students to accept and understand (Fadillah in Hajerah et al., 2024). In the context of early childhood education, effective media are those that are concrete, engaging, and allow children to learn actively. Well-designed media can enhance children's engagement and motivation to learn, as well as clarify abstract concepts. (Muryaningsih, 2021).

Augmented Reality (AR) is a technology that combines two or three-dimensional virtual objects into the real world in real-time (Azuma in Safitri et al., 2022). In the education sector, AR provides an immersive learning experience, increases student engagement, and makes abstract material more concrete and easier to understand. This technology has been proven effective in improving learning outcomes and student interest at various levels of education. (Mustaqim & Kurniawan, 2022). A comprehensive study of 49 international journal articles indexed in Scopus from 2013 to 2023 found that AR provides many benefits, such as increasing motivation, creating a supportive learning environment, enhancing academic performance, assisting children with special needs, and promoting children's social and emotional development (Nirmala et al., 2024). Additionally, AR has been proven effective in increasing children's participation in

learning, particularly in early literacy and the introduction of foreign vocabulary. (Masmuzidin & Aziz, 2018).

The *Animal* AR 3D Safari app is an AR-based learning media designed for early childhood. This app displays 3D animal models that can be accessed by scanning *flashcards*, complete with the pronunciation of the animal names in English as well as the sounds of the animals themselves. With engaging visuals and supportive audio features, this app serves as an enjoyable and interactive learning tool to introduce English vocabulary. (Puspitadewi dkk., 2020). International research also shows that AR applications designed for English language learning in early childhood significantly increase motivation, social-emotional connections, and learning outcomes compared to traditional methods such as the use of ordinary picture cards. Children who learn with AR applications demonstrate better performance in recognizing and understanding English vocabulary, both in direct testing and delayed timing. (Rahmadani dkk., 2024). In addition, AR also provides a more enjoyable and interactive learning experience, making children more focused and enthusiastic in the learning process. (Harsanto & Rifai, 2024).

Learning English in early childhood has significant benefits for children's cognitive, social, and linguistic development. Children aged 5-6 years are in a golden age phase that is very ideal for learning foreign languages because their ability to imitate and remember is at an optimal stage (Arumsari et al., 2017). This is in line with the findings of Hanafiah et al. (2022) who emphasized that the sensitive period of brain development in children before the age of 8 is the optimal time for foreign language learning, including English. At this time, children can more easily absorb and understand new languages through enjoyable learning methods such as games, songs, and stories. In addition, collaboration between teachers and parents is very important in supporting the success of English language learning in early childhood. Fun and visual learning approaches are highly recommended, considering that young children learn better through direct experiences, play, and visual-auditory interactions.

Previous research has shown that AR-based learning media has a positive impact on children's learning outcomes. Pahlevi et al. (2024) found that the use of AR-based storybooks significantly improved students' learning outcomes. Meanwhile, Atikah et al. (2023) stated that the AR media developed for learning in kindergartens increased children's cognitive abilities by 19.94%. These findings strengthen the assumption that

AR technology is a suitable and effective medium for use in early childhood education, including in foreign language introduction.

METHODS

This research uses a quantitative approach with a quasi-experimental design. The research design used is a nonequivalent control group design, which involves two groups: the experimental group that is given treatment in the form of Animal AR 3D Safari learning media, and the control group that uses flashcard learning media. The subjects in this research are children in group B (ages 5–6 years) at TK Naura Nashyefa in Maros Regency. The population in this study consists of 30 children, and all of them were used as samples with saturation sampling technique, which was then divided into two groups, namely 15 children as the experimental group and 15 children as the control group. Data were collected through several techniques, namely observation, tests, and documentation. Data were analyzed using descriptive statistical analysis to describe the learning outcomes of children before and after treatment, as well as non-parametric statistical analysis using the Wilcoxon Signed Rank Test to determine significant differences in English language ability between the experimental and control groups. The instruments used included observation sheets and test items that were developed based on indicators of children's English language ability.

RESULT AND DISCUSSION

a. Result

This research aims to determine the influence of the use of digital media in learning Animated 3D Animals based on Augmented Reality technology towards the learning outcomes of English language for 5-6 year old children in Natural Kindergarten, Malros Regency. The research subjects total 30 children, divided into 15 children in the experimental group and 15 children in the control group. The achievement of English language learning was measured before and after the treatment (pre-test and post-test) using test instruments that included three main indicators, namely the achievement of language learning for:

1. Mention back several basic concepts related to English grammar,
2. Mention the capital in English according to the gallery.

3. Align several elementary concepts specifically related to family dialogue in English. The following is the analysis of the pre-test and post-test results related to the English dialogue for both groups.

Table 1. Analysis of Pre-Test and Post-Test of Experimental Group

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Eksperimen	15	7	12	9.47	1.598
Post-Test Eksperimen	15	16	23	20.07	2.086
Valid N (listwise)	15				

The average score of group 1 in pre-tests was 9.47, while after treatment the average score became 20.07. Thus, there has been an increase in average scores of the experimental group by 10.6.

Table 2. Analysis of Pre-Test and Post-Test of Experimental Group

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Kontrol	15	7	12	9.27	1.534
Post-Test Kontrol	15	12	18	14.47	1.995
Valid N (listwise)	15				

In Table 2 of the results, the mean values of the control group before treatment were obtained at 9.27, while after treatment, the mean values became 14.47. Thus, there was an increase in the control group's mean values, which was 5.2.

Based on the results, it can be concluded that the experimental group experienced an increase in mean values that were significantly higher than the mean values of the control group, which were relatively smaller. Hence, it can be stated that the mean values of the experimental group were higher than the mean values of the control group both before and after treatment.

Furthermore, to determine the significance of this increase statistically, the Wilcoxon Signed-Rank Test analysis was used. The results of the test are presented in the following table.

Table 3. Results of the Wilcoxon Signed Rank Test Experimental and Control Groups

Ranks

		N	Mean Rank	Sum of Ranks
Post-Test Eksperimen - Pre-Test Eksperimen	Negative Ranks	0[a]	.00	.00
	Positive Ranks	15[b]	8.00	120.00
	Ties	0[c]		
	Total	15		
Post-Test Kontrol – Pre-Test Kontrol	Negative Ranks	0[d]	.00	.00
	Positive Ranks	15[e]	8.00	120.00
	Ties	0[f]		
	Total	15		

Test Statistics[a]

	Post-Test Eksperimen - Pre-Test Eksperimen	Post-Test Kontrol - Pre-Test Kontrol
Z	-3.417[b]	-3.413[b]
Asymp. Sig. (2-tailed)	<.001	<.001

The Wilcoxon test results for English language proficiency for the experimental group showed a value of -3.417 and a significance value (2-tailed) of 0.001 < 0.05, thus it can be concluded that there is a significant difference in English proficiency in the experimental group before and after the treatment. The Wilcoxon test results for English language proficiency for the control group showed a value of -3.413 and a significance value (2-tailed) of 0.001 < 0.05, thus it can be concluded that there is a difference in English proficiency in the control group before and after the treatment.

Through the Wilcoxon test that has been conducted between the experimental group and the control group, it can be concluded that the intervention given to the experimental group and the control group has a significant influence on improving English vocabulary skills. The results indicate that when viewed from the Z scores, the experimental group has a greater absolute value of Z, meaning that changes in the experimental group are statistically more significant. Thus, the use of the 3D Augmented Reality application in learning provides a positive and effective impact on improving English vocabulary skills in children aged 5-6 years.

b. Improvements

Based on the research results, the use of the Animal AR 3D Safari learning media based on Augmented Reality (AR) technology has a significant impact on improving the English language skills of children aged 5-6 years at Naura Nashyefa Kindergarten. The data shows that the average score of the experimental group increased from 9.47 before the treatment to 20.07 after the treatment, while the control group only increased from 9.27 to 14.47. The Wilcoxon Signed Rank Test results yielded a significance value of 0.001 (< 0.05), indicating a significant difference between the two groups in the improvement of children's English language skills.

The higher improvement in this experimental group indicates that AR-based learning media is more effective compared to conventional media such as flashcards. Animal AR 3D Safari presents 3D animal models that can be accessed by scanning flashcards, complete with the pronunciation of the animal's name in English and the sound of the animal itself. These visual and audio features have proven to assist children in recognizing, mentioning, and interpreting English vocabulary in a more enjoyable and interactive way.

The results of this study are consistent with international findings that state that the use of AR in early childhood education can enhance children's motivation, engagement, and learning outcomes. A review study by Nirmala dkk. (2024) An analysis of 49 international journal articles indexed in Scopus from 2013 to 2023 concluded that AR offers many benefits, such as creating a supportive learning environment, enhancing academic performance, assisting children with special needs, and promoting children's social and emotional development. AR has also been proven effective in increasing children's participation in learning, particularly in the areas of early literacy and foreign language vocabulary introduction. The use of card-based AR with 3D animations and sound can enhance word recognition, learning motivation, and children's engagement visually, auditorily, and kinesthetically.

Research Hanafiah dkk. (2022) also emphasizes that the sensitive period for children's brain development before the age of 8 is the optimal time for learning foreign languages, including English. During this period, children are more easily able to absorb and understand new languages through enjoyable learning methods, such as games, songs, and stories, supported by collaboration between teachers and parents.

This reinforces the relevance of using AR media as an innovative learning tool that aligns with the developmental characteristics of young children and current global needs.

In addition, other international studies highlight that learning English from an early age can accelerate language acquisition, enhance cognitive abilities, and broaden children's horizons in facing the era of globalization. Interactive and technology-based learning, such as AR, is highly recommended to overcome the limitations of conventional media that are often less engaging for young children.

Thus, the results of this research not only strengthen international findings but also provide empirical evidence that AR media such as Animal AR 3D Safari is very effective in enhancing the English language skills of early childhood, both in terms of vocabulary recognition, meaning comprehension, and children's learning motivation. The use of AR also supports more contextual, visual, and enjoyable learning, in line with the developmental characteristics of early childhood and the demands of 21st-century learning.

CONCLUSION

The results of the research that have been conducted demonstrate that the use of augmented reality media applications like Animal AR 3D significantly affects increased motivation among students aged 5-6 years. The students who used this application showed higher improvements in recalling vocabulary, naming objects appropriately, and articulating words in English compared to those who used conventional media in the form of flashcards. The Animal AR 3D media proved capable of creating learning experiences that are more interactive, engaging, and enjoyable. The use of 3D visualization and learning activities in English provided stimulating visual and auditory stimuli that effectively support the learning development Digital literacy is increasingly important. In this regard, an augmented reality-based learning media has become an innovative and effective alternative in improving English language skills in PALUD institutions, especially to help learners understand English vocabulary with more contextual and meaningful explanations.

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