

The Use of Augmented Reality (AR) Applications in Enhancing Preschool Children's Vocal Pronunciation Skills

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Abstract

This study aims to investigate the effectiveness of using Augmented Reality (AR) applications in enhancing preschool children's vocal pronunciation skills through a qualitative approach. With the rapid development of information and communication technology, there is a need to understand how this technology can be utilized in the context of preschool education. The use of AR, which combines virtual elements with the real world, offers a more engaging and interactive learning method. This study involves direct observation of the interaction of 18 preschool children with AR applications and interviews with them to obtain their views and experiences regarding vocal pronunciation learning using this technology. The results show that AR applications can increase children's interest in learning and help improve their vocal pronunciation skills. It is hoped that the findings of this study can guide educators and policymakers on effectively utilizing technology in preschool education, as well as stimulating children's interest and language skills holistically.

Keywords: AR, Vocal Pronunciation, Preschool.

Introduction

The development of information and communication technology (ICT) today has greatly influenced everyday life. It cannot be denied that this technological advancement has brought significant changes in various fields, particularly in education. Nordin & Bacotang (2021), in their study, stated that ICT is widely used at all levels of education, from early childhood to higher education. Unsurprisingly, the use of technology in education is gaining more attention, especially in early childhood education. Meanwhile, in the study by Zazali, & Nasir, (2022), it was proven that conventional teaching methods and the lack of engaging teaching aids for children result in children not paying attention and disturbing their peers.

The development of information and communication technology (ICT) in the field of education has driven a shift from traditional learning methods to learning processes that use computer assistance. Learning materials are created with multimedia applications and

developed in the form of specialized software. One promising technology in this context is Augmented Reality (AR). AR combines virtual elements with the real world, making learning more interactive and engaging. Augmented Reality (AR) technology in education has great potential to make classes more interesting, informative, and easier to understand (Singaravelu & Sivakumar, 2020).

This study aims to explore the effects of using AR applications in enhancing preschool children's vocal pronunciation skills, with a primary focus on increasing interest and the effectiveness of vocal learning. With advanced visual and audio integration, AR can help preschool children better understand and master vocal pronunciation. Unlike traditional teaching methods, which may be boring or difficult for children to understand, AR applications can capture their attention in a fun and interactive way. This not only increases their interest in learning but also helps them remember and apply what they have learned.

However, there is a lack of in-depth studies on the effectiveness of AR applications in preschool education, particularly in vocal pronunciation learning. Therefore, this study will investigate the extent to which AR applications can enhance preschool children's vocal pronunciation skills and how this technology can motivate them to learn more enthusiastically. Through a qualitative approach, this study will collect data from observations, interviews, and document analysis to gain a comprehensive understanding of the potential of AR applications in early childhood education.

Literature

Review Augmented Reality Applications in Education

Augmented Reality (AR) is one of the teaching media that is increasingly being adopted by skilled and IT-literate teachers. In line with the rapid development of the digital era, the use of technology in education has become a necessity. AR is an innovation that can enrich the learning experience by combining real and virtual world elements. In the context of preschool education, AR offers great potential to enhance the effectiveness of teaching and learning. This article discusses the use of AR applications in preschool education based on recent literature reviews.

The literature shows that AR applications have been widely used as teaching media by teachers worldwide. Previous studies have proven that AR can provide preschool children with more interactive and engaging learning experiences. Some key benefits of using AR in preschool education include increased interest, motivation, and learning effectiveness. The use of augmented reality in science learning can enhance academic achievement, understanding, and concentration among slow learners (Hassan, 2018). In a study conducted by Irmy, (2023), aimed at developing Augmented Reality (AR) media using Assemblr Studio Web in Natural and Social Sciences (IPAS) subjects, it was found that the development of AR media with Assemblr Studio Web could increase student engagement in the IPAS learning process at MTsN.

AR not only enhances children's interest in learning but also helps improve their understanding and memory. With clearer visualization and deeper experiences, children can better grasp learning concepts. A study by Letchumanan, & Aidah (2024), shows that AR technology is capable of attracting children's interest in science subjects and further

increasing scientific knowledge among preschoolers. Meanwhile, Abdul Rauf, F., & Tan, W. H. (2020), in their study explored the potential of AR, particularly in fostering creative thinking through coloring activities among preschool children.

In addition, AR also provides an interactive learning platform where children can interact directly with learning objects. This helps strengthen learning through practical and hands-on experiences. For example, AR applications used for phonics learning have shown effectiveness in helping children understand and remember syllables, as well as improving their pronunciation skills. Augmented Reality (AR) provides a learning environment with potential to enhance children's experiences and knowledge during the language learning process (Che Samihah, 2020).

The use of Augmented Reality applications in preschool education has proven to offer many benefits in enhancing children's interest, motivation, and learning effectiveness. Literature reviews indicate that AR provides a more interactive and engaging learning platform, helping children understand and remember learning concepts better. With the significant potential offered by AR, it is appropriate to continue exploring and integrating this technology into the preschool education system to enrich children's learning experiences. Further research and innovation in AR applications are expected to continue making meaningful contributions to the field of preschool education.

Preschool Children's Vowel Pronunciation Skills

Despite numerous studies on the use of AR in subjects like mathematics and science, research focusing on the use of AR to enhance preschool children's vowel pronunciation skills remains limited. This article aims to explore the potential of AR in assisting preschool children in mastering vowel pronunciation skills.

Vowel pronunciation skills are crucial foundations in children's language development. Correct vowel pronunciation aids children in reading, writing, and communicating more effectively. Preschool children often encounter challenges in blending consonant-vowel (CV) sounds to form words. Therefore, innovative approaches like AR can be utilized to address these challenges in a more interactive and engaging manner.

Additionally, AR can help children visualize how vocal sounds are formed and pronounced. For example, an AR application can show how the mouth moves to produce specific sounds and provide clear audio examples. This offers essential visual and auditory guidance for children to master vowel pronunciation correctly. Using Augmented Reality technology, healthy food forms can be visualized in real shape with three-dimensional objects. These three-dimensional objects can be used as interactive learning media because they can be enlarged or reduced and come with audio explanations (Sartono, N. N., Susanti, F., & Pratondo, A. 2021).

To enhance pronunciation skills, AR applications can provide interactive exercises where children can attempt to pronounce vowel sounds and receive immediate feedback. For example, the application can indicate whether their pronunciation is correct or needs improvement. This instant feedback helps children continuously improve their pronunciation.

Past Related Studies

	Title	Authors	Year	AR	Vowel Pronunciation	Preschool	Data Analysis	Country
1	Augmented Reality in learning Malay Language	Siti Khadijah Ali & Nur Syafiqah Azmi	2019	/			Quantitative	Malaysia
2	Enhancing Knowledge and Interest in Science Education among Preschool Students by Developing and Using Augmented Reality Technology	Yogalakshimi Letchumanan & Aidah Abdul Karim	2024	/		/	Qualitative	Malaysia
3	The Potential of Augmented Reality in Coloring Activities: A Study at a Preschool	Fadilah Abdul Rauf & TanWee Hoe	2020	/		/	Quantitative	Malaysia
4	Augmented reality for preschool children: An experience with educational contents	Fatih Aydođdu	2022	/			Quantitative	Turki
5	Learning Using Augmented Reality for Early Childhood in Indonesia	Ailsa Salsabila Cahyaningtyas	2020	/		/	Qualitative	Indonesia
6	Students' motivational beliefs and strategies, perceived immersion and attitudes towards science learning with immersive virtual reality: A partial least	Kun-Hung Cheng & Chin-Chung Tsai	2020	/			Qualitative	British

	squares analysis							
7	The Use of Augmented Reality in the Magic Book Application for Introducing Professions in Early Childhood Education	Rakhmad Dedi Gunawan	2020	/		/	Quantitative	Indonesia
8	AR-Learn Model: Development Model for Learning Applications Based on Augmented Reality (AR)	Fitri Nurul'ain Nordin, Abdul Azim Muhammad Isa, Muhamad Zaidi Zakaria, Hazrati Yahya & Muhamad Zhafri Mohammad Nazmi	2022	/			Quantitative	Malaysia
9	Learning Syllables in Malay Language through Augmented Reality Content for Preschool Children	Nursyafiqah Abdul Halim & Goh Eg Su	2023	/		/	Quantitative	Malaysia
10	Revealing the true potential and prospects of augmented reality in education	Yiannis Koumpouros	2024	/			Qualitative	Greece
11	The Impact of Using Augmented Reality as Teaching Material on Students' Motivation	Salwa Anuar, Nurhuda Nizar & Muhamad Azlin Ismail	2021	/			Quantitative	Malaysia
12	The Effectiveness of Augmented Reality Technology in the Topic of Pattern Learning	Haliza Binti Idris, Mariani Binti Md Nor & Mohd Nazri Bin Abdul Rahman	2022	/		/	Quantitative and Qualitative	Malaysia

13	Development of Augmented Reality for Proper Handwashing Steps for Children	Azita Ali & Syafawati Mohd Subki	2022	/		/	Qualitative	Malaysia
14	Innovative AR-Based Flashcards as Educational Game Tools to Enhance Children's Language Intelligence During the Covid-19 Pandemic.	Siti Dela Soflianti, Puspita, Aulia, Milkhatun & Deni	2021	/		/	Qualitative	Indonesia
15	Development of Augmented Reality-based Color Learning Application for Pre-school	Siti Nur Amierah Mohd So'ad, & Mohd Norasri Ismail	2022	/		/	Quantitative	Malaysia

The article above explores 15 studies related to the use of Augmented Reality (AR) in various educational contexts from 2019 to 2024. The study participants come from diverse backgrounds, involving teachers and students at the preschool education level. Some key findings of this review include that a significant portion of the studies, specifically 10 out of 15, focus primarily on preschool education. Furthermore, the majority, 11 out of 15 studies, emphasize the use of AR in teaching various subjects. However, none of the articles are related to the Malay language subject in vowel pronunciation. Based on the research methodology, the majority of the reviewed articles, 9 out of 15, use a quantitative research approach, while 6 studies rely on a qualitative research approach, offering a deeper understanding of the use of AR in preschool education. In terms of global scope, the above studies showcase diverse geographical distribution. Seven studies were conducted in Malaysia, three in Indonesia, one each in Turkey, Greece, the United Kingdom, and two in the United States. Therefore, these findings illustrate the application of AR in different educational settings. Below are some literature reviews of the selected articles.

The study by Ali and Azmi (2019), examined the use of Augmented Reality (AR) technology in learning the Malay language. AR was utilized to help students understand and master the Malay language better through interactive and immersive learning experiences. The study's results showed that using AR in learning significantly enhanced language comprehension and student engagement. A quantitative approach was used to assess the effectiveness of AR in Malay language learning, and the study was conducted in Malaysia.

The subsequent study by Letchumanan and Karim (2024), focused on enhancing preschool children's knowledge and interest in science education through the use of Augmented Reality (AR) technology. AR was employed as a teaching aid to make science learning more engaging and interactive, ultimately increasing students' interest and knowledge in the subject. A qualitative approach was used to gain in-depth insights into children's experiences with AR technology in science learning, and the study was conducted in Malaysia.

The study by Fadilah Abdul Rauf and Tan Wee Hoe in 2020 explored the potential use of Augmented Reality (AR) technology in coloring activities in preschool. The results of this study provided insights into how AR can be used to enhance children's coloring experiences by adding interactive and visually appealing elements. While the study showed that AR can increase children's interest and engagement in coloring activities, further exploration is needed on the impact of AR on children's learning outcomes. Investigating the relationship between the use of AR in coloring activities and children's achievement or engagement will provide insights into the effectiveness of AR in enhancing learning outcomes in preschool.

The study by Azita Ali and Syafawati Mohd Subki in 2022 developed an Augmented Reality (AR) application to teach children the proper steps for handwashing. The use of AR in this application aimed to make learning more engaging and interactive, helping children better understand and follow the handwashing steps. A qualitative approach was used to gain in-depth insights into the effectiveness of this AR application, providing valuable perspectives on how AR technology can enhance children's understanding and implementation of handwashing steps.

The study by Salwa Anuar, Nurhuda Nizar, and Muhamad Azlin Ismail in 2021 examined the effects of using Augmented Reality (AR) as a teaching material on student motivation. AR was used to make learning more engaging and interactive, which could enhance student motivation and engagement. A quantitative approach was used in this study to assess the impact of AR on student motivation, showing that the use of AR technology in learning significantly increased students' motivation and interest. The study's results indicated that AR can not only enrich the learning experience but also has the potential to improve academic achievement by stimulating students' interest and commitment in the learning process.

Based on the above studies, identified research gaps include the need for further studies on the effects of using Augmented Reality (AR) in preschool children's vowel pronunciation learning and the exploration of challenges in implementing AR technology in teaching and learning vowels using different sample sizes and research approaches. Addressing these research gaps will contribute to a deeper understanding of effective and feasible teaching practices and the integration of different AR technologies in early childhood education to enhance vowel pronunciation skills. Additionally, studies are also needed to explore the long-term effects of AR use on children's language development and how AR can be tailored to meet the individual needs of each child. By addressing these gaps, researchers can provide clearer and more detailed guidance for teachers in applying AR in preschool classrooms, thereby strengthening the effectiveness of this technology in early childhood education.

Conclusion

The studies discussed indicate the significant potential of Augmented Reality (AR) technology in early childhood education. The use of AR has been proven to enhance understanding, motivation, and student engagement across various subjects, including Malay language, science, and coloring activities. However, there are several research gaps that need to be addressed to optimize the use of AR in early childhood education. This study has shown that the use of Augmented Reality (AR) technology has great potential in improving preschool children's vowel pronunciation skills. Through literature analysis and conducted studies, it has been found that AR can make the learning process more interactive, engaging, and effective. This technology not only helps maintain children's interest and engagement but also accelerates the process of mastering vowel pronunciation in a fun and meaningful way.

However, there are still gaps that need to be addressed to ensure the effectiveness of AR usage in preschool education can be fully realized. Firstly, there is a need for further research on the effects of using AR in teaching preschool children vowel pronunciation. This research is crucial to understand how AR can aid in vowel pronunciation instruction and overcome challenges that may arise in its implementation

Secondly, research also needs to focus on exploring challenges in implementing AR technology in teaching and learning vowel pronunciation using different sample sizes and research approaches. This will provide a more comprehensive insight into the effectiveness and sustainability of AR in early childhood education..

Further studies are also needed to explore the long-term effects of AR usage on children's language development and to understand the challenges faced by teachers in implementing this technology in the classroom. Future research should also consider larger sample sizes and diverse research approaches to provide a more comprehensive picture of the impact of AR in early childhood education.

Furthermore, long-term studies are needed to explore the effects of AR usage on children's language development and how AR can be tailored to meet the individual needs of each child. This will help provide clearer and more detailed guidance for teachers in implementing AR in preschool classrooms.

By addressing these gaps, researchers can strengthen the effectiveness of AR technology in early childhood education and provide a solid foundation for broader applications in this field. Findings from these studies will contribute significantly to our understanding of AR's potential in enhancing vowel pronunciation skills and academic achievements of preschool children, as well as providing more interactive and engaging teaching tools for educators.

With these findings, it is hoped that researchers, educators, and policy makers can collaborate to integrate AR technology more widely and effectively into preschool curricula. This initiative will not only enrich children's learning experiences but also provide a strong foundation for their future language and communication development. Overall, this research contributes to a deeper understanding of AR's potential in early childhood education and paves the way for innovative teaching techniques that meet the needs of contemporary education.

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