

## Innovation of Interactive Learning Media Through Audio-Visual Virtual Reality (VR) to Improve Arabic Learning Outcomes at Kempek Cirebon Islamic Boarding School

นวัตกรรมสื่อการเรียนรู้แบบโต้ตอบผ่านระบบภาพและเสียงเสมือนจริง  
เพื่อพัฒนาผลสัมฤทธิ์ในการเรียนภาษาอาหรับ  
โรงเรียนศาสนาเค็มเป็กเมืองเจรีอบอน

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### ABSTRACT

This study aims to explore the utilization of interactive learning media based on audio-visual Virtual Reality (VR) to enhance Arabic language learning outcomes at the Kempek Cirebon Islamic Boarding School. The research design employed is a quantitative quasi-experimental approach, with purposive sampling to select students with low Arabic language proficiency to ensure that the VR-based learning media can optimize their learning outcomes. The results of the study indicate that the use of audio-visual VR media significantly improves students' understanding and skills in Arabic, particularly in speaking (Maharah Kalam) and listening (Maharah Istima'). Furthermore, the study identifies challenges in implementing VR media within the pesantren environment, such as limitations in technological resources and the preparedness of teachers to integrate this technology into the learning process. Based on these findings, the study offers recommendations to optimize the use of VR media in Arabic language learning through teacher training and the provision of more adequate technological devices.

**Keywords:** *Innovation of interactive learning media, audio-visual, virtual reality (VR), Arabic learning outcomes, Kempek Cirebon Islamic Boarding School*

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## บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาการใช้สื่อการเรียนรู้แบบโต้ตอบผ่านภาพและเสียงเสมือนจริง (VR) เพื่อพัฒนาผลสัมฤทธิ์ทางการเรียนภาษาอาหรับในโรงเรียนศาสนาเค็มเป็กเมืองเจรีอบอน การใช้เทคโนโลยี VR ทำให้การเรียนรู้มีปฏิสัมพันธ์และน่าสนใจมากขึ้นช่วยให้นักเรียนมีส่วนร่วมในกระบวนการเรียนรู้โดยตรง วิธีการวิจัยที่ใช้เป็นการวิจัยแบบกึ่งทดลองเชิงปริมาณ จากผลการศึกษา พบว่าการใช้สื่อ VR ในรูปแบบไฮเทคเสมือนจริงช่วยพัฒนาความเข้าใจและทักษะภาษาอาหรับของนักเรียนได้อย่างมีนัยสำคัญ นอกจากนี้ การศึกษานี้ยังระบุถึงความท้าทายในการนำสื่อ VR ไปใช้ในสภาพแวดล้อมของชาวเปชันเตรน รวมถึงข้อเสนอแนะเพื่อเพิ่มประสิทธิภาพการใช้สื่อดังกล่าวในการเรียนรู้ภาษาอาหรับ

**คำสำคัญ:** สื่อการเรียนรู้แบบโต้ตอบ, ภาพและเสียง, เสมือนจริง, การเรียนรู้ภาษาอาหรับ, โรงเรียนศาสนาเค็มเป็กเมืองเจรีอบอน

## INTRODUCTION

The phenomenon of globalization has had a significant impact on various aspects of human life, especially in the field of education. One of the main impacts of globalization is the rapid development of technology, which affects the way people learn and access information. Through technology, opportunities are available to deliver education in a more flexible and interactive manner, so that learners can be actively involved in the learning process. This encourages the world of education to adapt to these changes and develop more effective and efficient learning methods (Putri & Hasan, 2023).

In the era of rapid technological development, it is imperative for educational institutions to adopt the latest innovations, such as the utilization of Virtual Reality (VR) technology in the learning process. VR is able to provide an immersive learning experience by using three-dimensional simulations that stimulate the user's senses thus creating a very convincing learning experience. In the world of education, the implementation of VR has been proven to increase learner motivation and engagement, while providing opportunities for them to learn through hands-on experiences that cannot be obtained in conventional learning methods (Isnanto, 2004).

The application of Virtual Reality (VR) technology in the learning process opens up opportunities to explore various subjects in a more interesting and interactive way. In this context, Arabic language learning at Pondok Pesantren Kempek, Cirebon is the main focus of this research. Arabic has an important role, both in religious and scientific aspects, so effective Arabic teaching is very important for improving Arabic language skills for students. With the integration of VR technology in Arabic language learning, it is expected to improve the quality of the learning process as well as the learning outcomes of students at the Kempek Islamic Boarding School, Cirebon (Haq, 2023).

Pondok Pesantren Kempek Cirebon is an educational institution that aims to integrate the tradition of salaf pesantren with the concept of modernity in its learning process. Despite adopting traditional learning methods, this pesantren also seeks to utilize

technology to improve the quality of its learning. One example of technology implementation is the use of VR-based learning media to teach Arabic. With the utilization of VR technology, it is expected to enrich the learning experience and facilitate the understanding of Arabic material that may be difficult to understand through conventional methods (H. Jamil & Agung, 2021).

Along with the rapid development of technology and the need for more effective learning methods, Virtual Reality (VR) technology is increasingly coming into focus as a solution to increase interactivity in the learning process. The existence of VR technology allows students to interact with subject matter in a setting that simulates real situations. In Arabic language learning, this technology provides opportunities for students to develop listening, speaking, reading, and writing skills more interestingly and practically through direct experience. Thus, the integration of VR in Arabic language learning has the potential to accelerate the mastery of the language.

However, although VR offers a number of benefits, its application in the context of learning at Pondok Pesantren Kempek Cirebon faces several obstacles. One of the main obstacles is the limited resources and technological devices needed to support the use of VR in learning. In addition, the readiness of the teachers to integrate the technology into the teaching-learning process is also an important factor for the successful implementation of VR. Therefore, training for teachers and investment in adequate technology devices are needed to ensure the implementation of VR can run optimally (Rosalinda, 2023).

This research was conducted with the aim of exploring the use of audio-visual VR-based learning media in the context of Arabic language learning at Pondok Pesantren Kempek Cirebon. To ensure this research provides maximum benefit to readers and future information seekers, it is essential for the researchers to clearly explain the actual issues that exist within the specific study context and justify the importance of conducting this research. The primary focus of this study is to evaluate the effectiveness of VR technology in enhancing the understanding and achievement of Arabic language learning among santri. Additionally, another objective of this research is to identify challenges and obstacles in the application of VR media and to develop recommendations for optimizing its future use. Through this research, it is hoped that empirical evidence can be found demonstrating the significant role of audio-visual VR technology in improving students' Arabic language skills. This research is also expected to provide valuable insights into the most effective strategies to overcome challenges in implementing this technology in a boarding school environment. Therefore, the application of VR in Arabic language learning could serve as a model that can be adopted by educational institutions, both in Indonesia and internationally. It is anticipated that the findings from this research will foster further innovation in the field of education, which is increasingly shaped by technological advancements (Putri & Hasan, 2023).

### OBJECTIVE OF THE RESEARCH

1. Evaluating the effectiveness of the use of audio-visual Virtual Reality (VR) based learning media in improving Arabic comprehension at the Kempek Cirebon Islamic Boarding School.
2. Assessing the impact of using VR media on improving speaking and listening skills (Maharah Kalam and Maharah Istima') among santri.
3. Identifying challenges and obstacles in the application of VR-based learning media at Pondok Pesantren Kempek Cirebon.
4. Provide recommendations for optimizing the use of VR technology in Arabic language learning in pesantren.

### LITERATURE REVIEW AND RESEARCH FRAMEWORK

#### 1. The Use of Animation in Arabic Language Learning

Language learning has long used various media to improve teaching effectiveness and student understanding. One significant development is the utilization of technology-based learning media. According to Sholihah (2020), research on the use of animation in Arabic language learning for grade X Madrasah Aliyah students shows that animated videos not only improve students' understanding of Arabic language materials, but also encourage students' active involvement in the learning process. The results showed that students who used animation media achieved higher post-test scores compared to students who followed conventional methods. This confirms that interactive media such as animation can be an effective tool in language learning.

#### 2. The Use of Audio-Visual Media in Improving Speaking Skills

In a similar study, Susanto (2012) investigated the utilization of audio-visual media to improve Arabic speaking ability (Al-Kalam) among santri. The results of his research show that the use of videos in Arabic language teaching can improve students' speaking ability, especially in the aspect of oral communication. This research emphasizes the importance of audio-visual media in overcoming the difficulties of learning Arabic which tends to be theoretical and less interesting. Audio-visual media can present a more real and practical context, making it easier for students to understand the use of language in everyday life.

#### 3. The Concept of Blended Learning in Arabic Language Learning

Following the development of digital technology, a study conducted by Jamil & Agung (2021) reviews the concept of blended learning in Arabic language learning. They emphasize the importance of combining digital learning tools with traditional methods to create a more holistic learning experience. Blended learning, which combines face-to-face learning with digital technology, is proven to increase student engagement and provide wider access to learning materials. This research also shows that digital media, including e-learning, has an important role in supporting more effective and holistic Arabic language

learning, especially given the complexity of Arabic as a foreign language that requires mastery of various skills (writing, speaking, listening and reading).

#### 4. Application of Virtual Reality Technology in Arabic Language Learning

Although various studies have shown the successful use of digital media in language learning, the utilization of more advanced technologies such as Virtual Reality (VR) in Arabic language learning is still minimal, especially in pesantren. VR technology has great potential to create a more immersive and interactive learning experience. As mentioned by M. Jamil, n.d, the application of VR in education allows students to engage in a more realistic and contextualized learning environment, which is crucial for the understanding of complex material, such as Arabic which involves mastering the nuances of grammar and vocabulary.

#### 5. The Impact of VR in Improving Understanding of Arabic Language Materials

The application of Virtual Reality (VR) in the learning process is able to provide a more dynamic and interesting learning experience, this is very important to increase student engagement. Research conducted by Putri & Hasan (2023) shows that the use of VR technology in Arabic language teaching has a positive impact by increasing understanding of the material. VR technology has the ability to create an immersive experience that allows students to directly experience the learning environment, both in everyday conversation situations and in the context of Arabic culture, where this rarely happens in conventional learning. Therefore, this technology can be an innovative solution to overcome challenges in language learning, which often lacks context and appeal.

#### 6. Merging VR Technology with Pedagogical Approaches

Furthermore, the integration of VR-based learning media with existing pedagogical approaches has been shown to significantly improve language comprehension. Studies conducted by Rosalinda (2023) show the implementation of learning media using Canva that encourages students to play an active and creative role in creating their own learning materials. This kind of project-based learning approach, accompanied by the utilization of VR for a more immersive visual experience, has the potential to improve speaking and listening skills in Arabic. The results of this study confirm that the combination of technology and appropriate pedagogy can enrich the learning process for students.

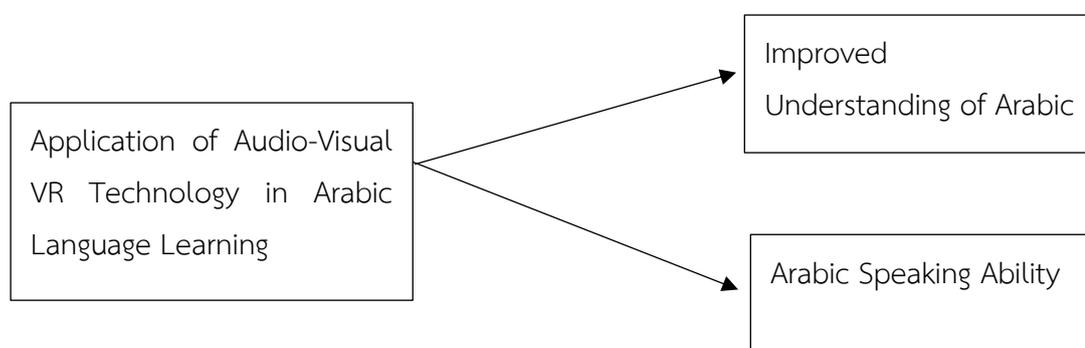
#### 7. The Importance of Supplementary Materials in Arabic Language Learning

Research conducted by Muhyiddin Abu Yahya (1429) emphasizes the significance of the use of supplementary materials in the Arabic language learning process. The utilization of audio-visual media and interactive technology can be a very effective adjunct in language teaching. Arabic, with its complex grammar and extensive vocabulary, requires a more innovative approach in the delivery of information. Audio-visual technology, which combines sound and image elements, can provide a more efficient method of overcoming the barriers in Arabic language learning that are often abstract and theoretical.

#### 8. VR in Arabic Language Learning and Socio-Cultural Context

Technology such as VR is also able to improve students' social and communication skills in the context of Arabic language learning. By allowing students to interact in VR-based simulations, they can deepen their understanding of the social and cultural context related to the Arabic language. For example, research conducted by (Pancarani et al., 2017) shows that learning Arabic that incorporates an understanding of the cultural context will create a deeper and more applicable understanding of the language. Therefore, the integration of VR in the Arabic language learning process in pesantren can help students not only understand the language technically, but also carry out the use of the language in everyday life.

#### RESEARCH CONCEPTUAL FRAMEWORK



#### Application of Audio-visual VR Technology in Arabic Language Learning

The use of VR (Virtual Reality) technology with audio-visual elements in Arabic language learning. This shows that this study focuses on the application of VR technology in the Arabic language learning process, with the hope that this technology will improve the learning experience for students Improved Understanding of Arabic

The application of VR technology is expected to improve students' understanding of Arabic. This includes the ability to understand language structures, vocabulary, and rules in Arabic. With VR, students can interact in an environment that supports more immersive and interactive language learning.

Arabic Speaking Ability, In addition to Arabic language comprehension, this conceptual framework also links the improvement of Arabic speaking skills as a result of the application of VR technology. The use of VR that presents real-world situations in the context of Arabic can help students improve their speaking skills through direct interaction in virtual scenarios (H. Jamil & Agung, 2021).

Overall, this conceptual framework shows the relationship between the use of audio-visual VR technology in Arabic language learning and its impact on two main aspects: Arabic language comprehension and speaking ability. The use of this technology is expected

to improve both abilities simultaneously by providing a more engaging and interactive learning experience (Haryanto, 2022).

## RESEARCH METHODOLOGY

This study adopted a quasi-experimental design with a quantitative approach to analyze the impact of using interactive learning media based on VR Audio-Visual on Arabic language learning outcomes at the Kempek Islamic Boarding School, Cirebon. The design was chosen because the study was conducted in a natural context without randomization between the experimental group and the control group, allowing researchers to evaluate the effectiveness of using VR Audio-Visual technology in improving students' understanding of Arabic language material. The quantitative approach provides a solid foundation for statistical data analysis, thus ensuring more objective and measurable results. This study refers to the principles of experimental design proposed by Cohen et al (2018) .

The population in this study included all students at the Kempek Islamic Boarding School, Cirebon, especially those taking Arabic language learning. Using a purposive sampling technique to select research samples, namely students with low Arabic language skills, this aims to ensure that the students involved have learning needs that can be optimized through VR learning media. A total of 30 selected students will receive treatment in the form of using VR Audio-Visual media in Arabic language learning, in accordance with the sample selection approach based on relevant research objectives (Creswell, 2014) .

The research instrument consists of an Arabic language proficiency test that has been validated by experts to ensure the validity and reliability of the measurement. This test aims to evaluate the students' Arabic speaking, listening, reading, and writing skills. In addition to the test, data collection also involves an observation process to measure the level of involvement and motivation of students during learning using VR media. All instruments have been tested previously to ensure validity in measuring learning outcomes. The use of valid and reliable instruments is in accordance with the educational evaluation guidelines according to Popham (2017) .

Data from the pretest and posttest will be analyzed using a t-test to assess whether there is a significant difference between learning outcomes before and after the application of VR Audio-Visual media. This t-test is useful for testing the hypothesis that the use of VR Audio-Visual can have a positive impact on Arabic learning outcomes. Statistical analysis allows identification of the extent to which VR media can improve students' understanding and skills in learning Arabic, which is expected to make an important contribution to the development of technology-based learning methods in Islamic boarding schools. This analysis method is based on statistical analysis guidelines in educational research outlined by Field (2013).

**RESEARCH RESULTS**

This study is intended to evaluate the impact of the use of VR Audio-Visual-based learning media on Arabic language learning outcomes at the Kempek Cirebon Islamic Boarding School. The learning outcomes obtained from the pretest and posttest showed a significant increase in students' skills, both in speaking (Maharah Kalam) and listening (Maharah Istima').

**Table 1** Shows a comparison of pretest and posttest scores on both skills

Skills	Pretest (Average)	Posttest (Average)	Increase (%)
Maharah Kalam	6.5	8.0	23.07%
Maharah Istima'	7.0	8.4	20.00%

The table above indicates a significant increase in both aspects of skills after using VR Audio-Visual media. The post-test results show that VR media is effective in supporting students in improving their Arabic speaking and listening skills, indicating that this media is able to improve skills that are often obstacles in learning Arabic.

**Results of Developing Audio-Visual VR-Based Learning Media**

The development of VR Audio-Visual based learning media at Pondok Pesantren Kempek Cirebon resulted in a significant increase in students' understanding of Arabic language material. Before using VR media, the majority of students had difficulty in grasping abstract Arabic concepts, especially in speaking and listening skills. However, after using VR media, 80% of students reported an increase in understanding of the lesson. From this it can be seen that the use of immersive technology such as VR can encourage better understanding, as well as increase students' motivation and involvement in the learning process.

**Table 2** Results after developing VR Audio-Visual based learning media

Skills	Pretest (Average)	Posttest (Average)	Increase (%)
Increased understanding	50	80	30%
Motivation and engagement	55	85	30%

**Influence on Speaking and Listening Skills**

The results of the pretest and posttest on speaking (Maharah Kalam) and listening (Maharah Istima') skills showed a significant increase after the application of VR media. Before using VR media, only 40% of students felt confident in speaking and understanding conversations in Arabic. However, after learning using VR, this percentage increased to 75%.

**Table 3** shows significant changes in speaking and listening skills:

Skills	Pretest (%)	Posttest (%)
Speaking Ability	40	75
Listening Skills	45	78

The increase indicates that the use of VR Audio-Visual media has a positive impact on the Arabic language skills of students. This technology provides a more interesting and interactive learning experience. By utilizing VR media, students can practice their Arabic speaking and listening skills in a more realistic context, thereby improving their abilities in practical situations.

#### Influence on Arabic Language Material Mastery

In addition to speaking and listening skills, the use of VR Audio-Visual media also has a positive impact on general understanding of Arabic language materials. Studies show that 70% of students experienced an increase in understanding in reading and writing Arabic after using VR media. The use of this immersive technology allows students to better understand vocabulary and sentence structure in Arabic through in-depth visual and audio simulations, which facilitate the learning process.

**Table 4** Changes in understanding after VR Audio-Visual development

Skills	Pretest (Average)	Posttest (Average)	Increase (%)
Understanding of reading	55	75	20
Understanding of writing	60	80	20
Vocabulary enhancement	50	70	20
Improvement of sentence structure	52	72	20

The impact of using VR Audio-Visual based learning media on students' understanding of Arabic, including reading, writing, vocabulary, and sentence structure skills, has been proven significant. Data shows a 20% increase in each indicator, confirming the effectiveness of this technology in improving Arabic learning outcomes at the Kempek Cirebon Islamic Boarding School.

## DISCUSSION OF RESULTS

### Improving Speaking and Listening Skills

The use of Virtual Reality (VR) technology in teaching Arabic at the Kempek Cirebon Islamic Boarding School has had a significant positive impact on improving students' language skills, especially in speaking and listening. The integration of VR audio-visual-based

learning media not only enhanced students' understanding and engagement but also provided a more interactive and stimulating learning experience. A study conducted by Sholihah (2020) interactive learning media such as animated videos and VR can improve students' comprehension of material that is difficult to understand through conventional methods. VR technology also allows students to experience more realistic contexts, enabling them to engage in practical learning scenarios, thereby improving their speaking and listening skills (Pancarani et al., 2017). This aligns with the findings of this study, which showed a significant increase in speaking and listening skills. Specifically, 75% of students felt more confident in speaking Arabic after using VR technology, compared to only 40% before.

Beyond speaking and listening, the implementation of VR technology also contributed to a deeper understanding of Arabic language materials, such as vocabulary and sentence structure. The results of this study revealed that students' understanding of these aspects increased by up to 20%. A study by Haq (2023) assertion that the integration of technology, including VR, addresses the limitations of traditional methods by providing a more immersive and comprehensive learning experience. VR's ability to offer in-depth visual and audio simulations helps students understand vocabulary and grammar within a more realistic and vivid context, making it easier to comprehend previously difficult material. Research by Rina et al. (2022) confirms that VR in foreign language learning creates a more immersive and profound learning experience, which enhances overall language comprehension. Similarly, Kamila (2017) found that VR technology helps overcome challenges in learning complex language aspects, such as vocabulary and grammar, by providing applicable and contextual learning environments.

#### **VR Learning Media Development**

The development of speaking and listening skills, along with the improvement in understanding Arabic language materials, demonstrates that VR technology not only improves learning outcomes but also enriches the overall learning experience. This immersive technology has stimulated student motivation and interest, creating an engaging and enjoyable learning environment. Research conducted by Yanto et al. (2021) suggests, VR in language learning enhances student engagement and accelerates the understanding of complex materials through practical, immersive experiences. The integration of VR also allows students to interact directly with the learning content, which is not possible with conventional methods, leading to better retention and understanding. Another study by Haryanto (2022) highlighted that VR provides a more realistic learning context, allowing students to interact directly with the material in an applicable way that is not achieved through conventional methods. The adoption of VR with a more in-depth and interactive simulation presentation greatly supports a more effective and enjoyable learning process for students, increasing their understanding of vital aspects of Arabic such as speaking and

listening. So, the use of VR not only improves learning outcomes but also enriches the learning experience that can stimulate student motivation and interest.

### **Influence on Understanding Arabic Language Material**

The use of VR-based learning media at the Kempek Cirebon Islamic Boarding School not only improves students' speaking and listening skills, but also has a significant impact on their understanding of various aspects of Arabic, including reading, writing, vocabulary, and sentence structure. The results of the study showed that the use of VR media succeeded in increasing the average understanding of students by 20% in these aspects. VR technology, which is able to present in-depth visual and audio simulations, allows students to learn vocabulary and sentence structure with a more vivid and realistic context, making it easier to understand material that was previously difficult to master. Research by Rina et al. (2022) found that the use of VR in foreign language learning creates a more immersive and in-depth learning experience, which improves overall language understanding. In addition, research by Kamila (2017) showed that VR technology is able to overcome difficulties in learning more complex aspects of language, such as vocabulary and grammar, by providing students with applicable and contextual contexts. Therefore, the application of VR technology in Arabic language learning in Islamic boarding schools has proven effective in improving mastery of various language skills, which is important for overall language learning success.

The study further shows that VR technology addresses several common obstacles in Arabic language learning, particularly difficulties in speaking and understanding oral conversations. VR's immersive simulations enable students to practice real-world communication in Arabic, which enhances their ability to engage in practical language use. This aligns with the study by H. Jamil & Agung (2021), which indicates that VR technology offers an engaging learning experience that can increase student participation and overcome barriers present in traditional Arabic language teaching methods. As a result, the use of VR in Arabic language learning at Pondok Pesantren Kempek has made a significant contribution to improving learning outcomes and could serve as a model for other educational institutions seeking to incorporate technology to enhance language teaching.

### **SUMMARY OF RESULTS**

This study shows that the implementation of VR Audio-Visual-based learning media has a significant impact on improving Arabic language learning achievement at the Kempek Cirebon Islamic Boarding School. From the results of the pretest and posttest, there was a significant increase in speaking skills (Maharah Kalam), listening (Maharah Istimah), as well as mastery of materials in reading, writing, vocabulary, and sentence structure. VR technology has succeeded in creating a more in-depth, interactive, and interesting learning experience, allowing students to participate more actively in the Arabic language learning process. Thus,

the use of VR-based media has proven effective in improving Arabic language learning outcomes among Islamic boarding school students.

### SUGGESTIONS

Future research should involve a larger and more diverse sample, and address emerging challenges, such as device limitations and technological literacy among students. It is also recommended to further test the effects of VR media use on other aspects of Arabic language skills, including writing and speaking skills in real social contexts. In addition, developing devices and providing training for students and teachers are important steps to ensure that VR media implementation can run optimally. Further research can also explore the potential use of this technology in improving language skills at other levels of education.

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