

A Systematic Review on the Utilization of Augmented Reality in Language Learning

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ABSTRACT

The purpose of this article is to review the utilization of Augmented Reality (AR) in foreign language learning. This article particularly reports on the results of review of several journal articles related to AR as a medium for learning foreign languages at all levels. The reviewed articles were published between 2017 and 2021, gathered from ERIC and Google Scholar. Twelve articles were chosen based on the relevance of the research with the purpose of the present study; that is AR in foreign language learning. The analysis results showed that the utilization of AR could help teachers conduct the learning process and students learn foreign languages. The use of AR in language learning could also increase students' motivation. The learning methods using AR were considered more fun, attractive, and memorable for teachers and students. This can be influenced by the affordance of AR to create a new learning environment. Learning objects were presented virtually in a real environment around the students so that such audio-visual elements can escalate their learning motivation.

Keywords: Augmented reality, Foreign language learning, Technology.

1. INTRODUCTION

Currently the world has experienced the era of the industrial revolution 4.0 and has even entered the era of society 5.0 where digitalization has become a basic thing and technology has developed far. The era of the industrial revolution 4.0 is an era of information technology development that develops rapidly and affects all life in the world. The era of the industrial revolution 4.0 was marked by the development of the Internet of Things which has now penetrated into various kinds of human life. While the era of society 5.0 is a concept that was first coined by the Japanese government. The concept of society 5.0 is not only limited to manufacturing, but can also solve various social problems with the help of the integration of physical and virtual spaces.

The presence of technology has a major impact on changes in all aspects of world life. All of these aspects, from the economy to education, have been influenced by digital technology. Digital technology is the most influential thing in the education system in the world today. This is due to the aspects of effectiveness, efficiency, and attractiveness offered by digital technology-based learning. Currently, the changes

caused by technology greatly affect the perspective and implementation of learning in the world of education.

The development of the digital era in the world of education provides many benefits for both educators and students. The presence of technology and digitalization at this time allows everyone to be able to gain knowledge easily and have wider access, especially in learning foreign languages. A foreign language is a language that is learned by someone as a medium of communication. Foreign languages are not the main language of a particular country and are also not used as the main language in daily communication. Foreign languages can also be learned formally at school or informally by each individual.

Learning a foreign language as a new language is considered difficult because it is not the mother tongue of every individual. Therefore, learning a foreign language requires more practice which can be done in various ways. One way that can be done to support the success of language learning is by using learning media. In this digital era, learning models utilize technology as a learning media to provide wider access and opportunities for students to build their own knowledge. The availability of technology in education can help students



Figure 1 Research stages.

learn foreign languages and educators can also create more innovative learning designs.

2. METHOD

Researchers used a systematic literature review to find articles that match with the research title. The SLR method is a method that provides output to existing data as well as a description of an invention so that it can be used as an example for research studies in compiling or making a clear discussion of the content of the problem to be studied (Andriani, 2021). The SLR method used is divided into 3 stages (Apriliana, Budhiluhoer, Jamaludin & Prihandani, 2020). The research stages can be seen in Figure 1.

The planning stage is the initial stage in conducting research starting from looking for titles and research outlines then looking for articles to be studied based on keywords. At the conducting stage, researchers searched and examined the articles that have been collected. At the reporting stage, researchers began to compose articles.

The researcher conducted the last five years (2017-2022) articles search using the topic of Augmented Reality in language learning in several databases such as ERIC and Google Scholar. The keywords in question are Augmented Reality and language learning. Based on the search results for articles, researchers found 2,817 articles from two databases as follows: ERIC (1,047) and Google Scholar (1,770 articles). The target for article collection from ERIC is twelve articles and articles from Google Scholar are limited in article collection to 13 articles. However, when searching for articles through Google Scholar and collecting articles that match the desired target, namely twelve articles, there were only eight articles that were appropriate because four articles that were not journal articles but proceeding articles, one article used a data collecting method and five articles don't match with our research's purpose. Therefore, ten articles found by researchers at Google Scholar and ERIC were eliminated and not used for this study. Researchers do not limit the type of research that should be used in this study. Therefore, there are several articles that use qualitative, quantitative or mixed types of research with various data collecting method carried out. After that researcher analyses the research purpose, research method and research results based on the articles that had been found and collected. The flowchart for article selection can be seen in Figure 2.

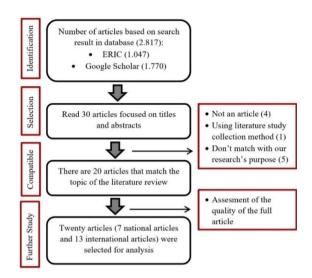


Figure 2 PRISMA flow chart for article selection.

3. FINDINGS AND DISCUSSION

Based on the results of a review of twenty journal articles, Augmented Reality can be used as a learning media including foreign language learning.

The results of a journal review on AR in foreign language learning include the application and use of Augmented Reality as a foreign language learning media (Gusdevi, Frencius & Khaerunisa, 2017; Maharani, Efendi & Johar, 2019; Endra, Cucus & Ciomas, 2020; Sulistiyaningsih, Rakhmanto, Kurniawan & Fadhilah, 2021; Tumini & Romadhon, 2021; Tsai, 2020; Karacan & Akoğlu, 2021; Binhorman & Altalhab, 2021; Redondo, Gonźalez & Sánchez, 2020; Wang & Khambari, 2020; Taksiran, 2018), and the development of learning materials with Augmented Reality (Setiawan, 2019; Keung & Sang, 2019; Bonner & Reinders, 2018; Chen & Chan, 2019; Chien, 2019; Lee, 2022).

3.1. Augmented Reality Relationship in Foreign Language Learning

Based on research by Setiawan (2019), Tumini and Romadhon (2021), and Yang and Mei (2018), it is stated that a learning that is only focused on one learning media such as textbooks can make students feel bored and lack motivation to learn, including learning foreign languages which can cause students to find it difficult in understanding the material and speaking skills. One way to overcome these problems is to use AR as a medium in foreign language learning. The use of information and communication technology in language learning has been widely practiced and has become a new approach to language learning. The summary of the articles can be seen in Table 1.

Table 1. Summary of articles

Researcher	Purpose	Research Place	Types of research	Sample	Method	Result
Gusevi, H., Frencius & Khaerunisa, N.L. (2017)	Introducing Augmented Reality technology as a means of learning for children	School	Study of literature	Teacher	Observation, Interview and Questionnaire	This application can help teachers and students in the teaching and learning process because students become more enthusiastic and active while learning
Maharani, D., Efendi, R. & Johar, A. (2019)	Apply Augmented Reality for designing and building learning media for Korean (Hangul) character recognition	Bengkulu	Literature review	Bengkulu Korean Fan Club (BKFC)	Sampling Technique	The application can run well on various types of smartphones and the respondents who have used AR feel that this learning media is good
Endra, Y.L., Cucus, A. & Ciomas, M. (2020)	Increase students' interest in learning Mandarin by using Augmented Reality (AR)	SMP IT Albana Natar Lampung Selatan	Field practice	Students of SMP IT Albana Natar Lampung Selatan	Observation	Augmented Reality technology-based learning methods can increase student interest and make it easier for students to understand the material described
Sulistiyaningsih, R., Rakhmanto, D.S., Kurniawan, I. & Fadilah, N. (2021)	Knowing the use of Augmented Reality technology as a medium for learning vocabulary	STMIK Widya Pratama Pekalongan	Qualitative, quantitative and Luther's multimedia development method	Students who have taken English courses at STMIK Widya Pratama	Interviews, questionnaires and testing	The user interface of the application is easy to use and can help learning English vocabulary through the features contained in the application
Setiawan, M.A. (2019)	Develop teaching materials in 3D Augmented Reality for teaching speaking Arabic	MAN Kota Mojokerto	Qualitative and quantitative	First Trial: 5 students of MAN Mojokerto City Second Trial: 30 students of MAN Kota Mojokerto.	Observations, interviews, and questionnaires	Augmented Reality (AR) technology based on an assessment of several aspects is considered feasible to be applied and developed in educational activities at all levels
Tumini & Romadhon, A.F. (2021)	Increase children's interest in learning Arabic	TPQ An- Nahdliyah At-Taqwa Bekasi	Qualitative	Santri at TPQ An-Nahdliyah At-Taqwa Bekasi	Multimedia Development Life Cycle Method and questionnaire	Utilization of Augmented Reality technology in this application runs well and is in accordance with the previous plan, which combines three- dimensional objects with the real environment
Karacan, C.G & Akoğlu, K. (2021)	Augmented Reality (AR) technology as an educational tool for foreign language education	School	Descriptive qualitative	Teachers and students	Study of literature	There are many Augmented Reality applications that can be used and applied in language courses, even though augmented Reality in education cannot be considered as the best choice for language learning because it is not specifically designed for education and is not fully compatible with any particular learning theory
Bonner, E. & Reinders, H. (2018)	Provide teachers with a practical introduction to augmented reality and virtual reality skills in foreign language education	School	Qualitative	Foreign language teachers and students	Study of literature	Research on the use of Augmented Reality and Virtual Reality in language education with most of the reports in the form of exploratory studies designed to investigate the possible use of Augmented Reality and Virtual Reality and student perceptions
Tsai, C.C. (2020)	To compare traditional lecture methods and learning methods using Augmented Reality	Elementary Schools in Central Taiwan	Quasi- experimental research method	5th Graders	Random Sampling Technique in Experiments	The motivation and performance of students who use Augmented Reality in learning are superior to students who use the traditional lecture method
Keung, C. & Sang, G, Y. (2019)	To increase the acceptance and application of Augmented Reality/Virtual Reality into video-based language education	South Korea	Studi Literature	Augmented Reality/Virtual Reality Platform developer company	Observation	Augmented Reality/Virtual Reality- based educational service platforms should be more researched and developed into cognitive platforms
Lee, J. (2022)	Compared the effects of an augmented reality (AR) mobile game and a printed game on student engagement and attitudes	South Korea.	Interviews	Fourth two undergraduates studying English as a foreign language	Qualitative data	Both groups demonstrated comparable levels of behavioral, cognitive, and emotional engagement as well as positive attitudes in learning EFL, without significant group differences.

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	toward foreign language learning					
Redondo, B., Cózar- Gutiérrez, R., González- Calero, J.A. et al. (2020)	To evaluate if the use of Augmented Reality in early childhood education improves the learning of English as a foreign language, increases pupils' motivation and helps children at this age to establish more positive socio-affective relationships.	State school in the region of Castilla- La Mancha, Spain	A Quasi- experimental study	52 and 50 early childhood education pupils, respectively.	A questionnaire	A significant improvement in motivation, learning and socio-affective relationships in the experimental group, who completed Instruction where AR was employed as a teaching tool, in comparison with the control group.
Mohamed Jamrus, M., & Razali, A. (2021)	Malaysian English teachers' readiness and acceptance in using Augmented Reality (AR) in English instruction and their intention to use AR in teaching English reading.	Malaysia	Inferential and correlational research	181 Malaysian English language teachers in Klang Valley, Malaysia,	The questionnaire	Malaysian secondary school teachers' acceptance and readiness to use Augmented Reality (AR) in teaching English reading are high and there is a positively significant relationship between acceptance and readiness with intention to use AR in teaching English reading.
Binhomran, K. & Altalhab, S. (2021)	To determine the usefulness of augmented reality (AR) technology in EFL vocabulary learning.	Saudi Arabia	An experiment	Seventh three Participants were primary school sixth- graders	Qualitative and quantitative	AR results in better understanding and higher levels of motivation among students. The study also highlighted the role of technology in the domain of language learning.
Wang, D & Khambari, M. (2020)	The investigation was to describe the change of teacher's role influence the effect of English sentence learning and the effect of game-based AR to English collaborative learning.	A vocational college in China	A qualitative method	Fifty vocational college students.	Semi-structured interview and questionnaires	The investigation revealed that the change of teacher role had a positive influence on the students' English learning effect.
Taskiran, A. (2018)	This study intended to find out how EFL learners evaluate their experience regarding the implementation of AR-based learning materials in their English language classes with a game-based approach.	Anadolu University, Turkey	A qualitative method	Eighty-three students enrolled in an intensive foreign language program as a preparatory class during their first year at higher education.	Questionnaire	Most of the students accepted the activities in an augmented learning environment highly motivating and enjoyable.
Aldossari, S. & Alsuhaibani, Z. (2021)	This study sought to measure the effect of using augmented reality (AR) on developing language learning.	One of the public elementary schools in Riyadh, Saudi Arabia.	A quasi- experimental research design	72 Saudi EFL elementary students and 80 EFL teachers.	A pre-test and a post-test and two questionnaires	The use of augmented reality enhanced EFL students' language learning significant
Yang, S. & Mei, B. (2018)	The case study aimed to provide a deeper understanding of learners' perception and experience of using augmented reality (AR) for language learning.	University	Qualitative method	Seven university students	Semi- structured interviews and direct observations.	Learners had positive perception and attitude towards the immersive language learning experience afforded by the AR program
Chen, R.W. & Chan K.K., (2019)	To Explore the Technology's value in early childhood education	Macau Kindergarten	Quasi- experimental Design	98 Children, aged between 5 and 6 years	A pre-test and a post-test and interviews	The Children enjoyed the AR Learning Activities, but there were certain challenges associated with using AR flashcards in a kindergarten setting
Chien, C. (2019)	To explore how how teaching such a course using AR technology impact English for specific purposes (ESP) learning and sustainable development	University		99 Collage students	Survey, compare 3 sets of questionnaires	This study reveals that adopting an AR approach for CPBL and ESP learning could strengthen student's awareness of ecotourism education and encourage them to reflect deeply on the topic of its sustainability.

Other research conducted by Keung & Yoo (2019); Sulistiyaningsih, Rakhmanto, Kurniawan & Fadhilah (2021); and Gusevi, Frencius & Khaerunisa (2017) regarding the introduction of AR in education or foreign language learning to teachers stated that the introduction and development of Augmented Reality learning media to teachers can help the learning process. The results of the two studies show that most teachers feel the use of Augmented Reality in foreign language learning, especially in vocabulary material, is very easy and is considered quite interesting to be used by students and can help increase student's interest in language learning. In addition, research conducted by Maharani, Efendi, and Johar (2019) with the main focus on the utilization of AR showed the result that application consist AR can be run properly on different types of smartphones and AR can be applied in designing and building learning media for Korean language (Hangul) character recognition using the Java programming language on the Android platform. The research conducted by Karacan and Akoğlu (2021) and Aldossari and Alsuhaibani (2021) AR technology in educational contexts has constantly been reported to contribute to several factors. There are numerous AR apps to take advantage of and implement in the language courses. As this technology was not specifically developed for educational and language learning purposes, its integration into the activities and tasks requires a well-thought teacher touch. The educational AR does not strike a pose as the greatest choice for language learning due to a) not being specifically designed for education, b) does not completely fit with a certain learning theory, c); however, this technology has a great potential to take over language learning field shortly with the upcoming advancements in the virtual machine environments. learning and intelligence. The research conducted by Jamrus and Razali (2021) explained that secondary school English teachers are open for changes in their instruction, especially in the use of Augmented Reality in teaching English reading as they feel it benefits both the students and the teachers. This study found that English teachers want to utilize Augmented Reality (AR) in the teaching of English reading and it was found that the teachers had high level of acceptance and readiness if the government were to introduce this into teaching instructions.

The research conducted by Bonner and Reinders (2018) on the integrity of Augmented Reality into language classes uses several examples of the use of Augmented Reality in language learning such as a campus tour in English using the Augmented Reality Platform that has been successfully implemented in a university in Thailand, making videos about activities that focus on giving and receiving directions to certain locations by using the AR Platform and creating backchannel with AR that can be accessed by students which can make it easier to access everything that is given by the teacher. The study also explains the

considerations that must be made in using Augmented Reality as a language learning media, such as technical innovation, capable devices, privacy and security. Therefore, it is important for educators to learn early about the development, potential, benefits and considering the risks of using Augmented Reality for learning, especially in foreign language learning.

3.2. Differences in Learning Foreign Languages Using Augmented Reality with Conventional Method

There are several studies conducted by Tsai (2020); Redondo, Cózar, Gonźalez, and Sánchez (2020); Binhomran and Altalhab (2021), these are regarding the effect of Augmented Reality on differences in foreign language learning performance and the comparison of learning motivation between conventional method and AR. The results of this study indicate that learning foreign languages with conventional method leads to low motivation and effectiveness of student's language learning because in the learning process, students only understand material from texts or readings and through vocabulary memorization exercises. Such mechanical method greatly reduces student's curiosity and novelty about learning a foreign language and make their original interest and motivation to learn disappear with boring reading. Meanwhile, vocabulary is an important component of linguistic knowledge and an important element for building mental syntax. It was also explained that in language learning, students can easily understand foreign languages with visual aids such as learning with animated videos, pictures, and AR.

The research conducted by Chen and Chan (2019); Chien (2019); and Lee (2022) explained that traditional learning method only rely on paper teaching materials. With the development of digital technology, learning is no longer limited to paper teaching materials. In particular, AR technology can be used to combine the real world with the virtual world, bringing more entertainment and functionality to users. In accordance with the results of research conducted by Endra, Cucus, and Ciomas (2020); Taksiran (2018); and Wang and Khambari (2020) regarding the application of Augmented Reality which is designed as a mobile application on various smartphones that has been tested to increase students' interest and interest in learning. In addition, it can make it easier for students to understand the material described and the voice features contained in AR application are very helpful for students in spelling foreign languages. In addition, the results of Tsai's research using an experimental method on 42 fifth grade elementary school students in Central Taiwan which lasted for four weeks with a teaching time of about thirty minutes each week showed that the use of AR in language learning was more effective in mastering language skills. Foreign language vocabulary

significantly increases student's learning motivation compared to using conventional method.

4. CONCLUSION

This study presents information about the use of Augmented Reality in language learning, especially foreign languages for teachers and students. In addition, based on the results of the study, it can be concluded that Augmented Reality has benefits that can be felt by teachers and students at various levels of education. Augmented Reality is considered to be applicable in language learning, especially focused on learning the vocabulary of a particular language. Unlike the case with conventional method, such as explaining in front of the class and giving assignments, learning method that use AR are considered more fun, attractive and provide a memorable learning experience for teachers and students. The use of AR can also create a new learning environment. Learning objects are presented virtually in a real environment around students so as to give a new impression on the language learning process that can motivate students in learning and provide a deeper understanding of the learning material presented because it uses two important aspects of learning such as audio and visual.

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