



EMBRACING THE DIGITAL ERA: A LITERATURE REVIEW ON DIGITAL TECHNOLOGIES FOR ARABIC LANGUAGE LEARNING AMONG YOUNG LEARNERS

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Abstract

The rapid development of digital technology has had a significant impact on the world of education, including Arabic language learning. Arabic, which plays an important role in education and religion, is now increasingly in demand among young people who are familiar with digital technology. This study uses a qualitative approach with library research methods to explore various technologies that can improve the effectiveness of Arabic language learning for young people. The inclusion criteria in this study include academic literature published between 2015 and 2024 that discusses the application of digital technology in Arabic language learning, while studies that are not relevant to the context of language education or are not technology-based are excluded. The results show that the use of mobile applications such as Duolingo and Memrise, online learning platforms such as Coursera and EdX, and interactive technologies such as Augmented Reality (AR) and Virtual Reality (VR) not only increase learning flexibility but also strengthen students' immersive and participatory experiences. In addition, the use of educational games, Artificial Intelligence (AI), and social media contributes to increased motivation and independence in learning. Critically, this study highlights that the success of technology implementation is greatly influenced by the readiness of digital infrastructure, teacher competence, and the learning culture in Indonesia, which still tends to be conventional. Thus, the integration of technology in Arabic language learning needs to be accompanied by teacher training, curriculum adaptation, and supporting policies in order to be implemented effectively and sustainably.

Keywords: Arabic Language Learning, Digital Technology, Among Young Learners, Mobile-Assisted Language Learning, Gamification, Immersive Learning

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INTRODUCTION

مقدمة

The development of digital technology has had a major impact on the world of education, enabling various innovations in the learning process, especially in foreign language learning. One language that plays an important role in education and religion is Arabic (Haq et al., 2024). Although the importance of Arabic proficiency is increasing, especially among the younger generation, conventional learning models, which are still dominant, are often unable to attract their interest (Akhsan & Muhammadiyah, 2020). The younger generation, who are familiar with technology and accustomed to quick access to information, want a learning process that is more interactive, flexible, and integrated with digital devices. (Nuryadin et al., 2025)

Advances in educational technology provide great opportunities to address these challenges. Various platforms, applications, and digital media can now be used to support Arabic language learning, making the learning process more efficient, interesting, and relevant to the characteristics of the younger generation (Yi et al., 2025). However, the wide variety of available technologies requires in-depth study to determine the most effective and relevant learning technologies for Arabic learners, especially the younger generation, based on credible findings from previous research. (Benchahda, Khadidja, 2024)

This study aims to identify, classify, and evaluate the most effective digital technologies in supporting Arabic language learning for young learners based on a review of the latest literature. This study uses a library research approach because it aims to collect, analyze, and interpret various relevant research results without conducting direct field experiments. This approach is considered appropriate for obtaining a comprehensive picture of the trends, effectiveness, and potential development of digital technology in Arabic language learning in the modern era.

Previous studies have shown that digital technologies such as learning applications, social media, and web-based platforms can increase student motivation and engagement in language learning. Research by Nurhayati et al. on "Information and Communication Technology-Based Arabic Language Learning in Batam City" highlights the use of Information and Communication Technology (ICT) in Arabic language learning at SMPIT Hidayatullah 02 Batam, which has been proven to improve student learning outcomes (Nurhayati et al., 2022). Khotijah et al. in their study on "Design and Implementation of Mobile Learning as an Effort to Improve Arabic Language Learning in Madrasah Aliyah" showed that the use of applications such as Google Classroom and Quizizz can make learning more interactive and flexible (Arifin et al., 2021). Meanwhile, Herri Trisna Frianto et al. developed Android-based online comic learning media for elementary school students that can be adapted for Arabic language learning, providing a new approach that is interesting and easily accessible to students. (Trisna Frianto et al., 2023)

Although various studies have shown positive results, there is still a lack of exploration of technologies that are specifically relevant and contextual to Arabic language learning, especially in Indonesia. In the Indonesian context, the application of digital technology in schools and madrasahs faces several obstacles, such as limited internet infrastructure, low digital competence among teachers, lack of training in the use of technology-based learning media, and education policies that do not fully support the systematic integration of technology. In addition, not all educational institutions have adequate resources to adapt new technologies in the teaching and learning process.

Therefore, this study is expected to make a significant contribution in guiding the appropriate, effective, and context-appropriate use of digital technology in Arabic language learning in Indonesia. The results of this study are also expected to serve as a reference for educational application developers, educators, and policymakers in optimizing the integration of digital technology to align with the needs and characteristics of the younger generation. Through the application of digital technology, Arabic language learning can become more dynamic, interactive, and relevant to the demands and developments of the current era.

METHOD

منهج

This study uses a qualitative approach with library research that focuses on identifying and exploring technologies that can be utilized in Arabic language learning for the current

generation (Rizka Widayanti, 2024). Through this approach, the researcher searched various literature sources such as textbooks, journal articles, and previous research results that discussed the application of technology in language education. The main data sources were obtained from academic databases such as Google Scholar, JSTOR, and ProQuest to find relevant references on the use of digital applications, e-learning platforms, and interactive software in Arabic language learning (Faiqoh et al., 2025). Data collection was conducted through a literature review that highlighted various technological innovations and recommendations that support the language learning process, especially those that are in line with the characteristics of the younger generation who are familiar with the digital world.

Data analysis in this study was conducted using descriptive qualitative methods by examining the findings from various collected literature. The focus of the analysis was on describing technologies that have the potential to be applied in Arabic language learning, taking into account aspects of ease of use, effectiveness, and relevance to the needs of today's students. The results of the analysis are presented narratively and supported by tables and diagrams that visualize the types of technologies, their advantages, and disadvantages. The presentation is supplemented with relevant references to maintain the validity of the research results (Rizka Widayanti, 2024). Thus, this study aims to produce comprehensive recommendations regarding effective Arabic language learning technologies for the younger generation who have a high preference for the use of digital media and mobile-based applications.

RESULT | نتائج

In this study, the author identifies various technologies that can be used in teaching Arabic to the younger generation, referring to developments in digital technology and the characteristics of that generation. The role of technology in Arabic language learning can be seen in the following image:

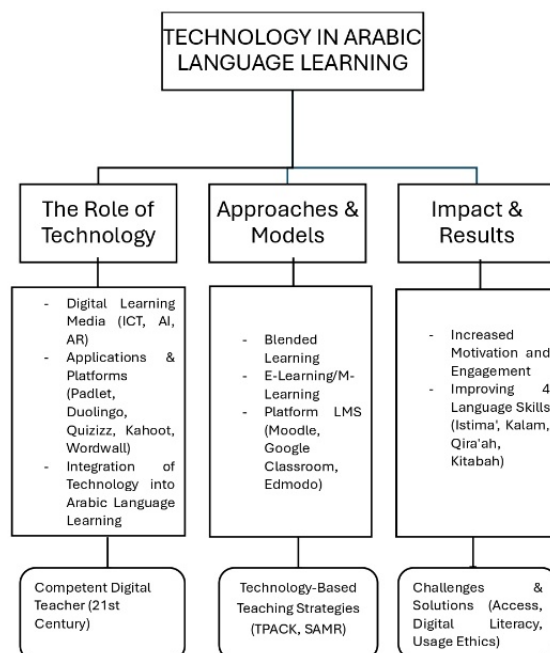


Diagram 1: Technology in Arabic language learning

Based on existing literature analysis, there are several technological recommendations that can improve the effectiveness of Arabic language learning, which are divided into various categories.

Arabic Language Learning Mobile Application

Mobile applications are now one of the main solutions in Arabic language learning, especially among the younger generation. With rapid technological developments, these applications provide users with easy access to learn anytime and anywhere, without being limited by space and time. This is very important for those who have busy schedules but still want to improve their Arabic language skills. Additionally, many apps are equipped with interactive features that simplify the learning process and make it more engaging. (Nawawi, 2023)

One popular application is Duolingo, which provides Arabic language learning with a gamification approach. Duolingo motivates its users through daily challenges and a reward system that allows users to learn in a fun way. Users can measure their progress and earn rewards in the form of points or badges each time they complete a lesson. This approach is effective in motivating users to remain consistent in their learning and achieve their learning goals. (Muttaqin et al., 2025)

Using Duolingo is easy and systematic by following these steps: first, download & create an account → select your target language. Second, set a daily goal — set the time/XP per day. Third, start the learning path (tree): follow the units: vocabulary → exercises selecting words/sentences → scheduled repetition. Fourth, use additional features: Duolingo Stories (read & listen), Podcasts (for English/Spanish), and speaking exercises (voice exercises). Fifth, use daily reminders & streaks for motivation. Sixth, combine with other resources (authentic media, classes).

Some of the advantages and disadvantages of Duolingo for users are: first, it increases motivation to learn vocabulary. Second, it helps improve speaking and pronunciation skills (due to its voice correction feature). Third, it is easily accessible and practical to use on mobile phones. Fourth, it helps form new, more consistent, and independent learning habits. Fifth, features such as animated characters, tiered levels, and interactive exercises make learning fun and engaging. The material is tailored to the user's skill level and supports the development of all four language skills.

This has been proven by research results showing that the Duolingo application, with its gamification approach, can increase motivation to learn Arabic among the younger generation. One study conducted by Muttaqin, Zuhdi, and Ridwan at MTsN 1 Malang used Self-Determination Theory (SDT) to evaluate the impact of the gamification-based Duolingo app on students' motivation to master mufrodat (vocabulary). The results of the study showed a significant increase in student motivation, with an average score of 88% based on the SDT questionnaire covering the aspects of autonomy, competence, and relatedness. These findings indicate that gamification features in Duolingo, such as daily challenges and rewards, are effective in increasing students' intrinsic motivation to learn Arabic. (Muttaqin et al., 2025)

However, Duolingo also has several weaknesses, such as a lack of depth for productive/advanced skills, dependence on automated exercises, excessive repetition, and limited vocabulary and skills.

In addition to these applications, Memrise is also a well-known application among Arabic language learners. Memrise offers a unique learning method using videos from native Arabic speakers. This allows users to hear the correct pronunciation and understand the context of vocabulary and phrases in everyday life. Users can learn various materials, ranging from basic

vocabulary to complex sentences, which are presented in an easy-to-understand and interactive format. (Subita & Ahsanuddin, 2023)

Using Memrise is also relatively easy and structured by following a few steps. First, download & create an account → select a course (official or community-created). Second, select a vocabulary set/theme → run a practice session (review & practice). Third, use multimedia features: images, native speaker audio, community-created mnemonics. Fourth, set up scheduled review intervals (SRS) — review words at specific intervals. Fifth, track your progress and review weak words regularly.

A study conducted by Subita and Ahsanuddin at MTsN 1 Malang examined the use of Memrise in Arabic language learning through blended learning. This study shows that the use of Memrise in combination with face-to-face learning can increase the effectiveness of learning, especially in vocabulary and sentence structure mastery. However, this study also notes several obstacles, such as inadequate facilities and limited features in the free version of the application (Subita & Ahsanuddin, 2023). Additionally, Memrise offers Arabic courses with over 7,000 words and 200 videos from native speakers, allowing users to learn relevant vocabulary and understand accent variations across different Arabic-speaking countries. (Essafi et al., 2024)

Not to be left behind, helloTalk also allows users to interact directly with native Arabic speakers through chat and voice messages, helping to practice speaking, listening, and understanding local expressions and culture (Rosilah & Ulfa, 2024). A study by Febriani et al. at UIN Imam Bonjol Padang examined the use of HelloTalk as an alternative medium for improving Arabic writing skills. This research employed a qualitative descriptive research design with data collection techniques including observation, interviews, and documentation. The results showed that the use of the HelloTalk application provided opportunities for students to improve their creativity and critical thinking. Students' writing skills improved with an average score of 75.3, as demonstrated by the use of chat themes in broader writing skills and interaction with native speakers to explore information in the language being learned. In addition, the process of correcting writing errors can be done directly. These findings indicate that the use of the HelloTalk application increases the intensity of students' Arabic writing skills. This study recommends further research to test the effectiveness of the HelloTalk application on other foreign language skills using more diverse research methods. (Febriani et al., 2023)

In line with this, there are several advantages to this application. First, direct interaction with native speakers → authentic conversation practice & increased fluency. Second, the instant correction & voice message features help with pronunciation & oral comprehension. Third, according to several studies, it increases motivation, confidence, and independent learning.

In its use, hellotalk has several stages of use as follows: First, download & create a profile → specify the languages you are fluent in and those you are learning. Second, find a language exchange partner (filter by location/age/purpose) → send a greeting/introduction. Third, use the text chat, voice message, voice/video call, and in-line correction (native correction) features. Fourth, request specific feedback (e.g., “please correct my grammar and pronunciation”). Fifth, establish rules/etiquette and use the block feature.

From these three applications, we can see an in-depth comparison of their usage:

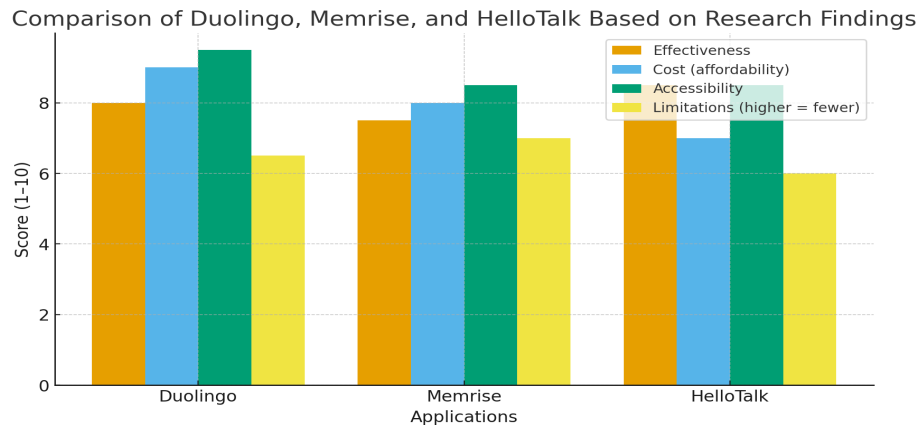


Diagram 2: Comparison of Duolingo, Memrise, and HelloTalk

Based on the results of research and literature analysis from the graph, it can be seen that:

1. Duolingo excels in accessibility and affordability.
2. HelloTalk is most effective for real communication skills.
3. Memrise is strong in vocabulary retention but slightly below average in accessibility.

Online Learning Platform

With the advancement of internet technology, various online learning platforms have become very useful resources for young people who want to deepen their knowledge, including learning Arabic (Pimada & Muhammad Afif Amrulloh, 2020). These platforms provide easy access to Arabic language courses taught by licensed instructors from around the world. This allows learners to gain a quality learning experience without being limited by distance and time. Platforms such as Coursera and EdX offer Arabic courses designed by leading universities, with curricula that integrate theory with hands-on practice. Users can take these courses flexibly and obtain certificates from leading educational institutions, which can certainly be an added value to their professional careers. (Delassi et al., n.d.)

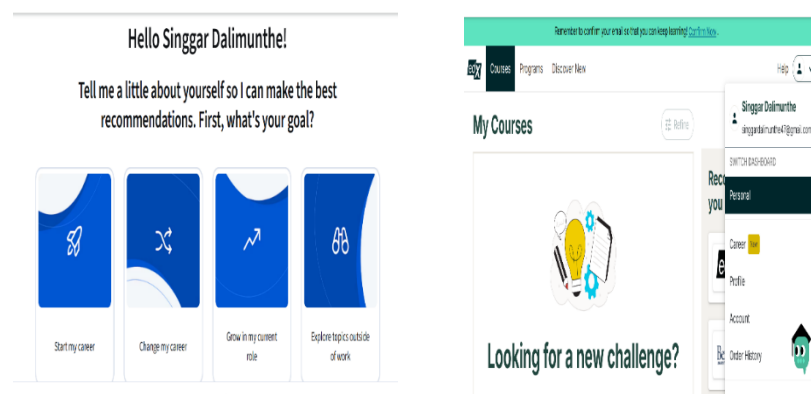


Figure 1: Coursera and EdX App Menu

Coursera offers an "Arabic for Beginners" specialization, consisting of three consecutive courses, hosted by Khalifa University, one of the leading universities in the United Arab Emirates. The first course, "Arabic Alphabet and Phonology," equips participants with a basic understanding of the Arabic alphabet and phonology, including an introduction to letters, numbers, and gender differences in Arabic. The second course, "Communicating in Arabic Culture," focuses on mastering everyday vocabulary and expressions used in Arab social and cultural contexts. Meanwhile, the third course, "Arabic in the Workplace," teaches the use of

Arabic in professional situations, such as in work, education, and technology. Each course is designed to be completed in approximately one month, with an estimated study time of 4 hours per week, and can be accessed flexibly at the participant's pace. Upon completion of this specialization, participants will receive a certificate that can enhance their professional credibility.

On the edX platform, Qatar University offers an "Arabic for Non-Arabic Speakers" course designed for beginners. This course teaches the basics of conversational Arabic through interactive videos featuring native speakers and engaging learning activities. The course aims to help participants begin basic conversations in Arabic without requiring a deep understanding of Arabic grammar. Furthermore, the course is free and flexible. Certificates from these courses, especially those from reputable institutions, can increase competitiveness in the global job market and demonstrate participants' commitment to developing language skills, while offering flexible schedules.

In addition to online learning platforms like Coursera and edX, YouTube is also a highly beneficial channel for those who want to learn Arabic independently. The diversity of available content allows learners to access materials tailored to their needs and ability level (Ulfah, 2022). Research by Rahmasari indicates that YouTube is an appropriate solution as a medium for learning Arabic during the pandemic with a Distance Learning (PJJ) system. Survey results showed that 80.4% of students strongly agreed with the use of YouTube as a medium for learning Arabic, indicating positive results. (Rahmasari, 2021)

Furthermore, research by Umbar et al. revealed that YouTube channels like Arab Podcasts are effective Arabic language learning resources for both beginners and college students. The engaging video content makes learning more enjoyable and easier to understand (Umbar et al., 2023). Thus, YouTube is not only an entertainment platform but also an effective learning medium for independent Arabic learning. Various studies have shown that YouTube can increase learners' motivation, interest, and understanding in learning Arabic.

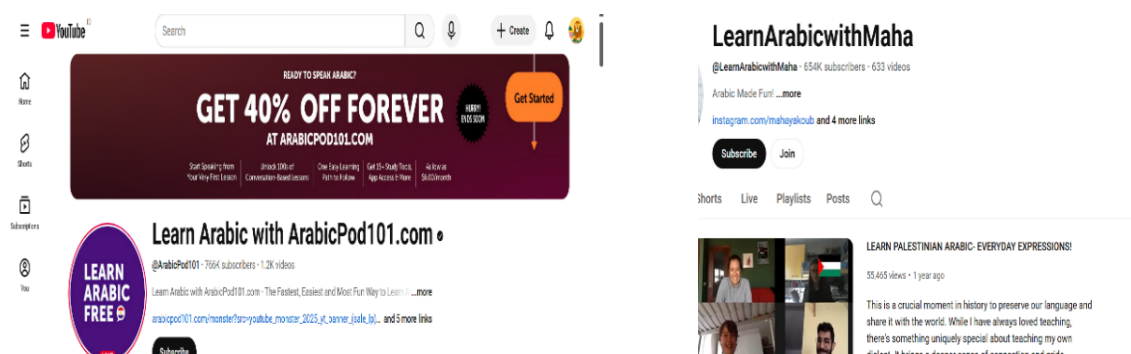


Figure 2: YouTube Channel

Examples of currently recommended YouTube channels include "ArabicPod101" and "Learn Arabic with Maha," which offer a variety of free learning content that can be accessed anytime. The content ranges from beginner to advanced levels and is presented in an engaging and easy-to-understand manner. YouTube's strength lies in its ability to present material in video format, combining visual and auditory elements, making it easier for users to learn Arabic pronunciation, vocabulary, and sentence structure. With this easy access, young people can utilize their free time to learn Arabic more efficiently and enjoyably.

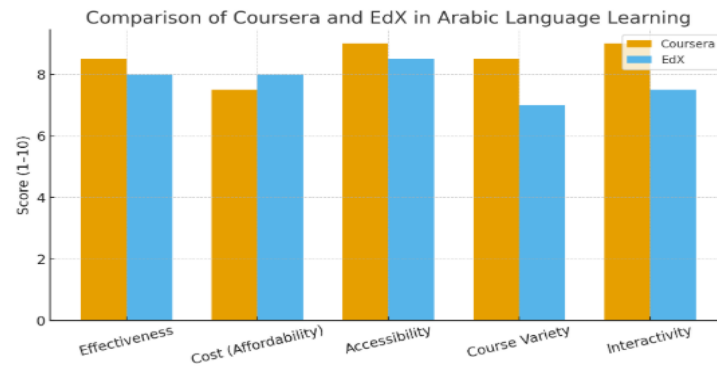


Diagram 3: Comparison of Coursera and EdX Usage

The table above shows that Coursera excels in terms of interactivity and course variety. EdX is slightly better in terms of affordability. Both are equally effective for university-level Arabic e-learning and professional development.

Digital-Based Educational Games

Young people growing up in the digital age are very familiar with the world of games. This experience can be leveraged to support Arabic language learning through specially designed educational games. These educational games offer engaging challenges and gameplay, making the learning process more enjoyable and interactive. Furthermore, research by Fawzani and Nurjannah has proven that learning Arabic through educational games increases students' interest in learning Arabic. The educational games used in this study successfully captured students' attention and increased their enthusiasm for learning Arabic. (Fawzani & Nurjannah, 2022)

Furthermore, Abdilah's research examined the key features of educational game technology used in Arabic language teaching and assessed its impact on learning effectiveness. The results showed that educational games can enhance the effectiveness of Arabic language learning by providing a fun and interactive learning environment. (Abdilah et al., 2025)

One example of an educational game for Arabic is Baamboozle, which tests Arabic reading and comprehension skills through a variety of increasingly challenging levels. This way, players can learn while playing, motivating them to continue developing and improving their Arabic language skills in a natural and engaging way. The variety of levels in this game also allows players to learn at their own pace, from beginner to advanced. Research by Hamidatussya'diyah and Anwar showed that using the educational game Baamboozle had a strong influence on students' interest in learning Arabic, with a correlation coefficient of 0.740, indicating that 54.76% of the increase in students' interest in learning came from using this game. Students who previously found Arabic difficult and boring became more enthusiastic and motivated to understand the material after using this educational game. (Hamidatussya'diyah & Anwar, 2025)

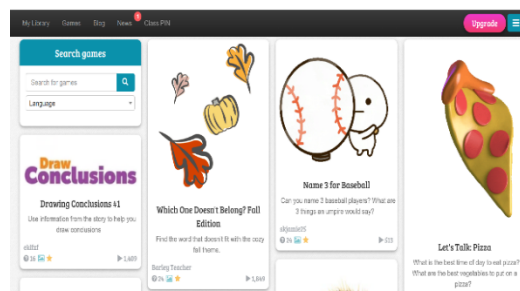


Figure 3: Baamboozle Application Menu

As for the advantages and disadvantages of Bamboozle media, here are the disadvantages of Bamboozle; (1) Bamboozle still has limited features, (2) It does not differentiate between the account of the question creator and the participant who answers, (3) It does not provide a permission mechanism to start the game. (4) The game can only be played in groups so it cannot be played individually, (5) The instruments are minimal because there is only backsound when answering, (6) Some participants tend to be passive when participating in the game in groups. However, Bamboozle also offers various advantages, (1) Ease of access without having to create an account, (2) Availability of various types of questions, (3) Its use can be applied at various levels of education in Indonesia. (4) This media also provides new experiences for students in group discussions through a fun game atmosphere, (5) Easy to access so as to increase student involvement and motivation in interactive learning. (Tsurayya & Sukmawati, 2023)

Thus, educational games serve not only as a means of entertainment but also have great potential as effective learning media. These games can stimulate students' interest in learning in a fun and interactive way, which is crucial in the context of Arabic language learning. Through in-game challenges, students can deepen their language skills naturally without feeling overwhelmed. Furthermore, educational games like Baamboozle can motivate students to continue practicing and developing their language skills continuously. The game's engaging and competitive features provide a more engaging and engaging learning experience. Therefore, educational games are a highly effective alternative for enriching the Arabic language learning process among students.

Virtual Reality (VR) and Augmented Reality (AR)

Virtual Reality (VR) and Augmented Reality (AR) technologies are rapidly developing and having a significant impact on education, including Arabic language learning. Both technologies enable highly effective immersive experiences, allowing users to learn Arabic in a more realistic and realistic context. One of the main advantages of using VR and AR is their ability to transcend the boundaries of the traditional classroom, creating a more immersive and engaging learning experience. By using these technologies, students not only learn Arabic theory and vocabulary but also apply what they learn in more contextual, everyday situations. (Sidik & Akhiryani, 2024)



Figure 4: Virtual Reality (VR) and Augmented Reality (AR)

Various studies have proven that Augmented Reality (AR) and Virtual Reality (VR) technologies have a significant impact on Arabic language learning, creating a more immersive and contextual learning experience. For example, research by Fauzan et al. developed an AR-based Arabic language learning application that utilizes the Durus Al-Lughah Volume 1 textbook. The app allows students to see interactive visualizations of words in Arabic that are directly related to real objects, thus significantly improving their understanding. (Fauzan et al., 2020)

Furthermore, a study by Qomah et al. showed that the use of AR in Arabic language learning can increase student motivation and engagement by combining the real and virtual worlds in real time, creating an engaging and memorable learning experience. Furthermore, research by Azisi et al. emphasized that the integration of VR technology can create a more interactive and enjoyable learning environment, allowing students to interact directly with the Arabic language environment to improve their understanding of vocabulary, grammar, and everyday conversation. (Azisi et al., 2025)

Thus, the application of Augmented Reality (AR) and Virtual Reality (VR) technology in Arabic language learning helps students not only understand theory and vocabulary but also apply their learning in more vivid and contextual real-world situations. These immersive experiences allow students to interact with objects and situations directly related to Arabic language use, developing practical skills relevant to everyday life.

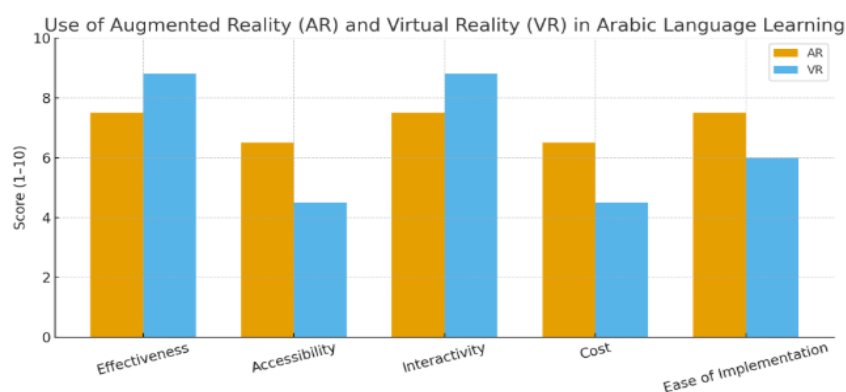


Diagram 4: Use of Augmented Reality (AR) and Virtual Reality (VR)

Social Media and Discussion Forums

The younger generation has a very strong attachment to social media, which now serves not only as a communication and entertainment tool but also as an effective learning tool. Social media provides users with opportunities to interact with various individuals around the world, including in the context of learning Arabic (Maskuri, 2024). This opens up opportunities for learners to interact directly with native speakers and gain more contextual and practical language learning (Maskuri, 2024). Various social platforms, such as Instagram, Facebook, and Twitter, now have numerous groups or communities specifically formed for informal Arabic language learning. These communities not only provide a space for asking questions and sharing information but also allow members to practice their Arabic skills through discussions and direct conversations, which are crucial for improving language fluency. (Safitri, 2024)

Research by Kurniati shows that social media platforms like Instagram, WhatsApp, and TikTok are effective in Arabic language learning. Instagram, for example, allows students to access engaging and interactive learning materials, while WhatsApp facilitates direct communication between teachers and students through voice notes and video calls. TikTok, with its short video format, can be used to convey material creatively and easily. The results of this study indicate that the use of social media in Arabic language learning can increase student motivation and engagement. (Kurniati, 2022)

Research by Rahmatia Safitri shows that social media can increase students' motivation to learn Arabic. Platforms like TikTok and YouTube provide access to engaging learning content, increasing students' interest in Arabic. Furthermore, social media allows interaction between

students and instructors, creating a supportive and collaborative learning community (Safitri, 2024). Furthermore, research by Muhammad Fadli Uzmi shows that social media, such as Twitter, plays a significant role in the evolution of Arabic among the younger generation. These platforms allow users to share Quranic verses and discuss their meanings, deepening Arabic understanding. This research also highlights the role of social media in shaping the religious identities and practices of the younger generation. (Uzmi, 2024)

Thus, social media is not only a communication and entertainment tool, but also an effective learning tool for improving Arabic language skills. Appropriate use of social media platforms can create an interactive and enjoyable learning environment, perfectly suited to the characteristics of a younger generation familiar with digital technology.

Artificial Intelligence (AI) Based Arabic Language Course

Artificial Intelligence (AI) technology has become an integral part of language learning, including Arabic, with a personalized and adaptive approach. AI tailors learning materials to the user's abilities and preferences, ensuring an effective and efficient learning experience (Fitrianto et al., 2024). One example of a platform that utilizes AI in Arabic learning is Babbel. This application uses AI algorithms to tailor Arabic courses to the abilities and preferences of its users. Babbel offers more structured learning based on students' actual abilities, ensuring that the material provided is relevant and accessible according to their needs. Babbel's AI can evaluate students' progress in real-time and provide useful feedback to help them overcome specific difficulties. This makes Babbel a highly effective tool for those looking to learn Arabic with a more personalized and efficient approach. (Tabssam et al., 2025)

Babbel boasts several features that set it apart from other language learning apps. These include a systematic presentation of material, a focus on grammar, and the use of spaced repetition techniques, which are effective in strengthening user retention. Furthermore, Babbel provides voice-based exercises and automated feedback to help users improve their pronunciation and comprehension (Essafi et al., 2024). Research by Garba and Hassan shows that AI-based apps, like Babbel, can improve listening, speaking, reading, and writing skills in Arabic learning for non-Arabic speakers. Participants in the study reported significant improvements in their language skills after using the apps and recommended their use to others. (Garba & Hassan, 2023)



Figure 5: Babbel Application Menu

In addition to Babbel, Rosetta Stone also uses AI technology to enhance Arabic learning through speech recognition. This technology provides immediate feedback on students' pronunciation, helping to correct errors instantly, and is particularly useful in Arabic, which has a distinctive pronunciation. This immediate feedback allows students to improve their speaking

skills without waiting for teacher assistance (Hijriyah et al., 2025). Rosetta Stone's AI enables more interactive Arabic learning by identifying language patterns and providing tailored exercises. This technology helps students address weaknesses and effectively improve the quality of their learning. (Hijriyah et al., 2025).



Figure 6: Rosetta Stone Application Menu

Dalam konteks pembelajaran bahasa Arab, studi oleh Umi Hijriyah et al, menunjukkan bahwa metodologi imersif Rosetta Stone, yang mencakup penggunaan TruAccent™, efektif dalam meningkatkan keterampilan mendengarkan dan berbicara siswa. Penelitian ini menyoroti bahwa teknologi pengenalan suara seperti TruAccent™ dapat membantu siswa memperbaiki pengucapan mereka dengan memberikan umpan balik yang cepat dan langsung (Hijriyah et al., 2025). Dengan demikian, Rosetta Stone menawarkan pendekatan pembelajaran bahasa Arab yang efektif dan efisien melalui integrasi teknologi AI, khususnya dalam aspek pengucapan. Penggunaan TruAccent™ memungkinkan siswa untuk memperoleh umpan balik langsung dan personal, yang esensial dalam menguasai pengucapan bahasa Arab yang tepat.

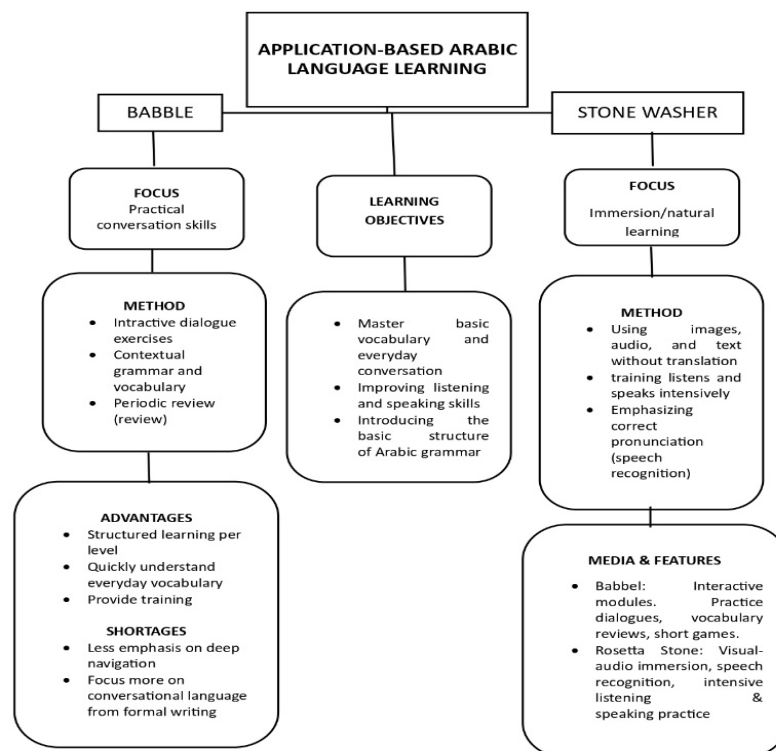


Diagram 5: Application-based Arabic language learning

Chatbots and Virtual Assistants

Chatbots and virtual assistants are increasingly becoming an essential part of the Arabic language learning process, especially for those looking to practice their conversational skills. This technology offers a direct user experience, giving students the opportunity to practice Arabic anytime without having to wait for a teacher or a study partner. One of the main advantages of using chatbots in Arabic learning is the flexibility they offer, allowing students to practice conversations in everyday contexts in real time. This allows students to understand grammar, vocabulary, and common expressions frequently used in everyday conversation without feeling stressed or awkward. (Hanandeh et al., 2024)

One example of a useful chatbot in Arabic learning is Replika, which can communicate in multiple languages, including Arabic. Replika allows students to practice conversations 24/7, allowing them to practice their speaking and listening skills at any time. This technology helps students become accustomed to natural conversation, improving fluency, and providing useful feedback to correct pronunciation and word usage errors, thus increasing their confidence in communicating in Arabic. (Satrio, 2025)

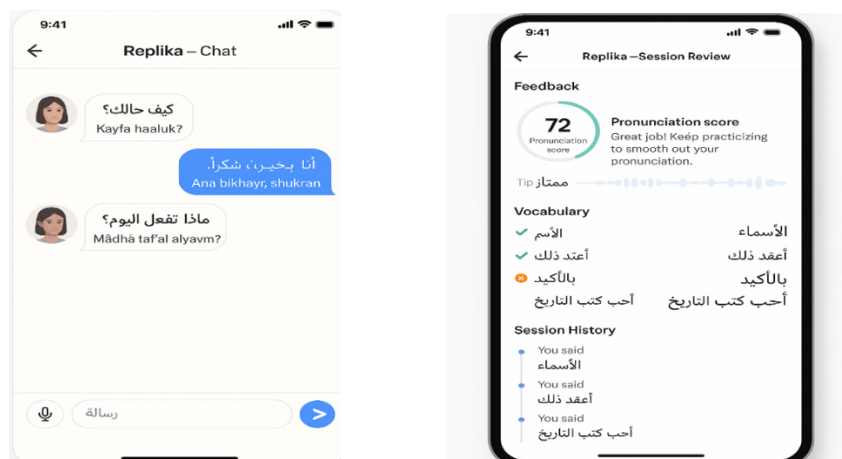


Figure 7: Chatbot and Virtual Assistant Application Menu

Research by Çakmak shows that using a chatbot like Replika in second language (L2) learning can significantly improve students' speaking performance compared to practicing with peers. Chatbots allow students to practice speaking independently, anytime and anywhere, without the pressure of a human audience, making the learning process more flexible and providing more opportunities to hone speaking skills (Çakmak, 2022). However, despite the improvement in students' speaking performance, the study showed that students' speaking anxiety actually increased after interacting with Replika. Reliance on a chatbot as the sole means of practice can increase anxiety because the interaction does not fully reflect real human conversation (Çakmak, 2022). Thus, Replika can be an alternative for improving speaking and listening skills in Arabic learning, with its flexibility and rapid feedback. However, the quality of the interaction must be considered to reduce student anxiety.

While chatbots like Replika offer numerous advantages in Arabic language learning, they also have limitations that need to be considered. The advantage is that Replika allows students to practice conversations independently at any time, providing significant flexibility and the opportunity to practice speaking and listening skills in real time (Fitri, 2025). The chatbot also provides automated feedback that helps students improve pronunciation, vocabulary, and grammar, while also increasing their communication confidence. However, using Replika also has

disadvantages: interactions with the chatbot do not fully replicate real-life human conversations, which can lead to speaking anxiety or a reliance on the chatbot as the sole means of practice (Ramadhan, 2023). Furthermore, chatbots are limited to pre-programmed conversational scenarios, so students may not be accustomed to the variety of expressions or more complex conversational contexts encountered in real-life social interactions. Therefore, Replika can be an effective learning tool when used as a complement to conversational practice, not as the sole method.

CONCLUSSION | خاتمة

The digital transformation in Arabic language education has provided various conveniences for learning Arabic, including digital media that can support the learning process. This includes mobile applications like Duolingo and Memrise, which offer gamified Arabic learning and the flexibility to learn anytime, anywhere. Online learning platforms like Coursera and EdX are also effective options, offering courses designed by leading institutions, allowing students to access quality learning without the constraints of time and place.

Additionally, augmented reality (AR) and virtual reality (VR) technologies offer immersive experiences that allow students to learn in real-world contexts, enhancing their understanding and engagement with the material. Educational games like Baamboozle have also been shown to increase student interest and motivation in an interactive and engaging way. Social media and platforms like Hello Talk, as well as AI-based apps like Babbel and Rosetta Stone, provide engaging alternatives for interacting with native speakers and tailoring learning to individual abilities. All of these technologies cater to the characteristics of a younger generation who are increasingly familiar with the digital world, providing them with new, fun and efficient ways to learn Arabic.

This study has several limitations that should be noted. The study's focus is limited to the available literature and largely examines commercial applications, thus potentially introducing selection bias and a lack of evaluation of local contexts and applications developed based on local culture. Furthermore, the descriptive nature of the study means that the findings do not empirically test the effectiveness of technology in real-world learning practices. Based on these findings, it is recommended that teachers and educational institutions consider integrating digital technologies, such as educational games, social media, and chatbots, into Arabic language teaching to enhance learning effectiveness and motivate the younger generation's learning interest. Further research should focus on more specific evaluations, such as assessing the influence of AR/VR technology, educational games, or artificial intelligence-based applications on students' motivation, engagement, and achievement in Arabic language learning in relevant local contexts.

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