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An Artificial Intelligence-Driven Role-Play-Based Communicative Learning Model for Enhancing Speaking Skills in Arabic Language Education

نموذج تعلُّم تواصلي قائم على لعب الأدوار مدعوم بالذكاء الاصطناعي لتنمية مهارات التحدث في تعليم اللغة العربية

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ABSTRACT

This study aims to enhance students' Arabic speaking skills through the development and implementation of an Artificial Intelligence (AI)-Driven Role-Playing Communicative Learning model. Conducted through Classroom Action Research (CAR) involving 40 undergraduate students at Zainul Hasan Genggong Islamic University, the study integrates AI-supported role-playing activities via the MemBot feature in the Memrise application. Data were collected through observation, questionnaires, and speaking performance assessments, and analyzed qualitatively. The results reveal that AI-driven role-playing significantly increases students' motivation and oral proficiency. Crucially, the MemBot feature facilitates a student-centered environment by providing adaptive, real-time feedback and personalized pronunciation correction, allowing learners to engage in authentic conversational contexts without the anxiety often found in traditional settings. This finding confirms that integrating AI with Communicative Language Teaching (CLT) principles creates an interactive, responsive, and transformative pedagogical framework for modern Arabic language education.

Keywords: Arabic Speaking Skills, AI-Driven Learning, MemBot, Role-Playing, Communicative Language Teaching.

مستخلص البحث

تهدف هذه الدراسة إلى تعزيز مهارات الطلاب في التحدث باللغة العربية من خلال تطوير وتنفيذ نموذج تعليمي تفاعلي قائم على لعب الأدوار ومدعوم بالذكاء الاصطناعي (AI). أُجريت الدراسة باستخدام بحث الفعل الصفي بمشاركة أربعين طالبًا جامعيًا في جامعة زين الحسن قنقون الإسلامية، حيث قامت بدمج أنشطة لعب الأدوار المدعومة بالذكاء الاصطناعي عبر ميزة "ميمبوت" في تطبيق "ميمرايز". وتم جمع البيانات من خلال الملاحظة والاستبيانات وتقييمات الأداء في التحدث، ثم تم تحليلها تحليلاً نوعيًا. وتكشف النتائج أن لعب الأدوار المدعوم بالذكاء الاصطناعي يزيد بشكل كبير من دافع الطلاب وكفاءتهم الشفوية. والأهم من ذلك، أن ميزة "ميمبوت" تيسر بيئة تركز على الطالب من خلال توفير ملاحظات تكييفية في الوقت الفعلي وتصحيح النطق المخصص، مما يسمح للمتعلمين بالانخراط في سياقات محادثة حقيقية دون القلق الذي غالبًا ما يوجد في البيئات التقليدية. وتؤكد هذه النتيجة أن دمج الذكاء الاصطناعي مع مبادئ تدريس اللغة التواصلي (CLT) يخلق إطارًا تعليميًا تفاعليًا وسريع الاستجابة وتحوّليًا لتعليم اللغة العربية الحديثة.

الكلمات المفتاحية: الذكاء الاصطناعي؛ تعليم اللغة التواصلي؛ لعب الأدوار؛ مهارات التحدث؛ تعلم اللغة العربية.

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INTRODUCTION

In the ever-evolving landscape of language learning, the integration of artificial intelligence has transformed how students interact, communicate, and construct knowledge. While methodologies like role-playing within Communicative Language Teaching (CLT) aim to encourage meaningful language use (Sayahi et al., 2025; Cahyo & Ristiani, 2024; Kao et al., 2025), their implementation in Arabic learning faces critical hurdles. Limited exposure to real-world communication remains a significant barrier; since successful language acquisition relies heavily on practicing in authentic contexts, a lack of such opportunities can stifle students' proficiency (Suhendry et al., 2025; Sadat, 2018; Aflisia & Hazuar, 2020). Furthermore, the absence of personalized feedback hinders progress, as constructive, real-time guidance is essential for helping learners identify specific areas for improvement (Puspitaningrum et al., 2019; Zulfa et al., 2023).

Addressing these hurdles is vital because speaking is a macro skill central to effective communication (Peng et al., 2025; Samal, 2020; Boonkit, 2010). The CLT approach emphasizes that the primary function of language is interaction (Zainudin, 2024; Rahmawati, 2021), and role-playing has long been recognized as a way to engage students in such active communication (Yen et al., 2013; Varalakshmi et al., 2023). However, traditional classroom implementations of CLT and role-play often fail to provide the authentic exposure and personalized feedback mentioned earlier (Pemberton, 2024; Amin, 2022). While previous studies have utilized role-playing to improve engagement (Hidayat, 2023), few have integrated Artificial Intelligence (AI) to support the necessary personalization and adaptability (Ouyang & Zhang, 2024).

The integration of AI in education has evolved from simple automation tools to intelligent systems capable of understanding, analyzing, and assessing human behavior. Education is guiding and enabling the learner to acquire knowledge and skills (Edi Kurniawan, 2022). In language learning, AI applications such as chatbots and GPT-based systems have been shown to personalize instruction, simulate real-world communication, and provide real-time feedback (Grab, 2025; Ulla et al., 2024). The use of AI in the learning process aligns with the Education 5.0 framework outlined by Agarwal et al. (2025), which advocates a student-centered, innovation-driven ecosystem that leverages technology to enhance human creativity, collaboration, and adaptability. In Arabic language learning, this alignment has the potential to shift pedagogy from a

teacher-centered to an AI-powered, collaborative communication approach, thereby enhancing language competency and digital literacy (Wiboolyasarin et al., 2025; Satrio, 2025; Wang et al., 2024). AI in this study has improved students' motivation and speaking skills (Fathi et al., 2024).

The rapid development of AI technology, such as innovative learning platforms, chatbots, and personalized learning systems, can be utilized to overcome these limitations. AI systems can simulate realistic conversational contexts, provide adaptive feedback, and analyze students' language proficiency levels (Gambhir et al., 2025; Hicham et al., 2025). By integrating AI technology and role-playing communication strategies, immersive, dynamic, and student centered learning can be created. Furthermore, integrating AI in communicative language learning through role-playing methods aligns with the principles of Education 5.0, which emphasizes personalization, collaboration, and innovation through technology-based learning (Nafisah, 2023; Razilu, 2025; Edi, 2017). This paradigm encourages educators to shift from conventional learning to experience- and data-driven learning models. In the context of Arabic language learning, this also aligns with the opinions of Patriasih et al. (2025) and Shruthi et al. (2025), and Moya & Camacho (2024), who argued that this shift is not merely a technological adaptation but also a pedagogical transformation that impacts the learning process and outcomes. Therefore, a learning model is needed that focuses on mastering language structures and communication skills supported by intelligent technology, and the digitalization of Arabic has had a broad and significant impact on various aspect of life and the development of society (Faedurrahman, 2023).

Therefore, this study proposes an AI-based communicative role-playing learning model as a transformative approach to Arabic language pedagogy. Consistent with the opinions of Nasihuddin (2024) and Heidari-Shahreza (2024), this study explores the role of AI in enhancing communication competency, engagement, and learning autonomy for students, while addressing the instructional challenges educators face. By combining a communicative approach with AI technology, this study seeks to contribute to the development of a collaborative, adaptive, and student centered learning paradigm, in line with the principles of Education 5.0. In addition to enriching theoretical studies on the application of CLT in the digital era, this research also provides practical implications for increasing the effectiveness of technology-based Arabic language pedagogy.

The main objective of this study is to design and evaluate an AI-based role-playing learning model to improve students' communication competency in Arabic language learning. Specifically, this research situates itself within the broader context of Arabic digitalization, which has significantly impacted social, cultural, and professional spheres. In an era where digital communication dominates global interaction, the digitalization of Arabic has had a broad impact on various aspects of life and societal development (Faedurrohman, 2023). Consequently, language learning is no longer confined to traditional classrooms but must interact with broader socio-cultural shifts. This study explores how artificial intelligence can address these challenges by providing adaptive, personalized, and student-centered learning that mirrors real-world digital demands. By leveraging AI-driven simulations, students can engage in authentic linguistic experiences necessary for navigating today's digitalized society. Based on the above explanation, the objectives of this study are: (1) to examine the integration of AI-based pedagogical and technological approaches in role-play communicative learning for Arabic language learning, (2) to test AI-based role-play communicative approach strategies to improve students' communication competencies, and (3) to develop and propose an AI-based communicative learning model for Arabic language learning. Thus, a learning model is needed that focuses on mastering language structures and communication skills supported by intelligent technology.

RESEARCH METHOD

This research is a Classroom Action Research (CAR). The subjects were 40 students enrolled in the Nursing Study Program at Zainul Hasan Genggong Islamic University who were studying Arabic. These students were in the even semester of the 2024-2025 academic years, with an average age of 18-19 years, and were familiar and fluent in using internet-based technology. The research was conducted from February to April 2025. In line with Dalle et al. (2019), this research is categorized as participatory CAR because the researcher, a lecturer, was directly involved in the research process from the beginning to the end, including the compilation of the report. The researcher was a participatory researcher who taught the course directly.

This research was conducted in 14 meetings and two CAR cycles. The cycles ended when the student pass rate for the Arabic course exceeded 90%. The minimum passing

grade for this course is 55 (a C), based on the grading standards at Zainul Hasan Genggong Islamic University. The first cycle covered learning materials on daily activities, including vocabulary, sentence structure, and cultural introductions, delivered through conventional teaching media. In the initial phase, all participants were given a pre-test to assess their listening and speaking skills in Arabic. In the second cycle, students studied and practiced Arabic communication using the Memrise application. Each cycle consisted of seven meetings. Syaifudin (2021) explained that this CAR has four main stages in each cycle: (1) planning; (2) implementation; (3) observation; and (4) reflection, referring to the Spiral Model of Kemmis, McTaggart, and Nixon (2014).

Data were analysed qualitatively. Data collection techniques included participant observation, questionnaires, and assessment of student work using an assessment rubric. The descriptive-qualitative data analysis method adopted from Miles, Huberman, and Saldana (2014) included: (1) data reduction; (2) systematic and logical descriptive presentation; (3) drawing conclusions based on the presented results; and (4) verification. Data on student learning ethics were collected from a questionnaire used to measure the learning ethics index in AI-Driven Role-Playing Communicative Learning, and data on dialogue quality were collected from student worksheets and Arabic communication practice assessments at the end of the cycle. Data analysis was conducted throughout the CAR activities. Data generated from these activities were processed and analysed qualitatively. This study also used comparative descriptive techniques for quantitative data. This was done by comparing results and data from each cycle in a student score table.

This study consisted of two cycles, each with four steps. In the first step, the researcher created a plan consisting of: (1) designing a syllabus; (2) developing a lesson plan for AI-Driven Role-Playing Communicative Learning; (3) preparing materials in the form of images, videos, or AI-based applications; (4) creating student worksheets; (5) creating observation sheets for the implementation of AI-Driven Role-Playing Communicative Learning; (6) designing a rubric to measure student learning ethics and the quality of their Arabic communication skills; and (7) designing assessment indicators and rubrics.

The second and third steps consist of implementation and observation, executed through seven distinct meetings in each cycle. Especially in the second cycle, the

integration of AI-based technology is structured into three phases: (1) Pre-communicative, where students use the Memrise application to master foundational vocabulary and correct Arabic pronunciation independently; (2) Controlled Practice, where AI-generated prompts or chatbots provide initial interaction simulations to build confidence; and (3) Authentic Role-Play, where students perform themed dialogues based on real-life nursing scenarios while being recorded for AI-assisted linguistic analysis. This structured integration ensures that technology does not merely replace traditional media but actively scaffolds the students' transition from vocabulary recognition to active speaking fluency. Observations are conducted simultaneously to monitor: (1) introductory activities and theme-setting; (2) the core AI-Driven Role-Playing activities; and (3) the concluding review and meeting closure.

The fourth step is reflection, which serves as the critical evaluation point for pedagogical improvement. Following the Spiral Model of Kemmis, McTaggart, and Nixon, the results from the first cycle—such as data on common pronunciation errors and levels of student engagement with the digital tools—are meticulously analyzed. If the 90% pass rate is not achieved, these reflections directly inform the 'Revised Plan' for the second cycle. For instance, if Cycle I reveals a lack of personalized feedback during role-play, the second cycle is adjusted to include more intensive AI-driven diagnostic feedback or refined role-play rubrics. This iterative process ensures that each cycle is not a mere repetition, but a targeted refinement aimed at overcoming the specific communicative barriers identified in the previous stage. The final data from both cycles are then compared to conclude the effectiveness of the AI-integrated communicative model.

RESULT AND DISCUSSION

Result

Enhancing Students' Motivation

Based on research data, the results of this study indicate that the AI-driven Role-Playing Communicative Learning method can increase learning motivation and improve students' speaking skills, aligns with the research of Ramadhan et al. (2025) entitled "The Evolution of Multimodal AI in Education: Innovations in GPT-5, Gemini Ultra, and the Transformation of Digital Learning," which found that multimodal AI can not only

improve learning accessibility and effectiveness but also facilitate the creation of more inclusive and contextual learning experiences. Suharyani et al. (2025) also explained that integrating technology-based pedagogical approaches can create an inclusive, adaptive, and effective learning environment. This is evidenced by the systematic tracking of student engagement through two cycles of intervention. The data reveal a clear progression in student motivation when transitioning from the conventional approach in Cycle I to the AI-integrated approach in Cycle II.

In the first cycle, while students demonstrated adequate attention, their active participation remained limited. Many students expressed hesitation during role-play activities due to a lack of immediate feedback and low confidence in their Arabic pronunciation. Observations indicated that conventional media did not provide sufficient interactive stimulation, resulting in a passive learning atmosphere where only a small portion of the class initiated dialogue.

In contrast, the second cycle showed a significant transformation. The introduction of the Memrise application and AI-based role-playing prompts significantly lowered student anxiety. Data from the assessment matrix showed that students' level of confidence increased as they received personalized, real-time feedback from the AI tools. This shift was characterized by a higher frequency of students volunteering to express opinions and a notable enthusiasm for completing role-play tasks. Students reported a higher level of satisfaction because they felt more prepared and supported by the technology, leading to a more inclusive and dynamic classroom environment.

The implementation of AI-driven Role-Playing Communicative Learning in this Kalam (speaking) course was conducted in two cycles, guided by the learning motivation assessment matrix, as described in Table 1.

Table 1.
Student Learning Motivation Assessment Matrix

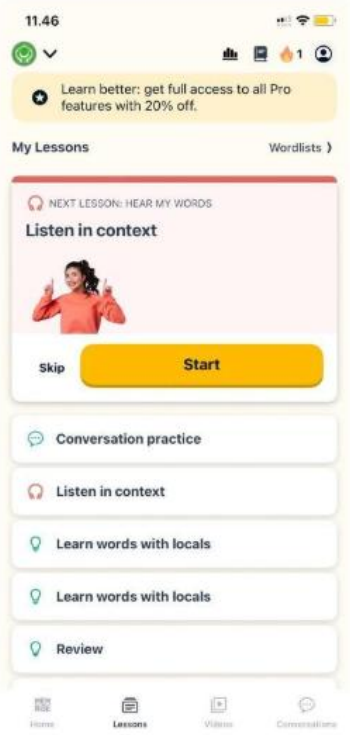
No.	Motivation Aspect	Indicator
1.	The student's level of attention during the learning process	Demonstrating enthusiasm for learning
2.	The student's level of need or desire for learning	Active participation in learning activities
3.	Student's level of confidence	Having the courage to express opinions or answer questions
4.	Student's level of satisfaction with the learning process	Be able to complete assigned tasks

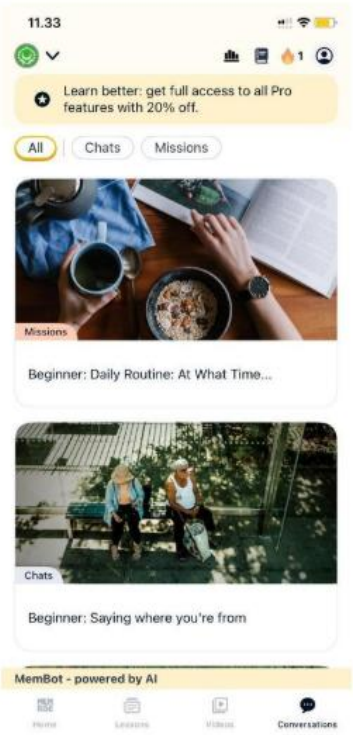
Table 2.
Comparison of Student Learning Motivation Results in Cycle 1 and Cycle 2

No.	Categories	Number of Students	
		Cycle 1	Cycle 2
1.	High	7	12
2.	Medium	21	24
3.	Low	12	4
TOTAL		40	40

Based on the data obtained in Table 2, the study's results indicate a significant increase in student learning motivation between cycles 1 and 2. This increase can be observed from the distribution of student learning motivation categories, which experienced positive changes. In cycle 1, 7 students (17.5%) were in the High category, 21 students (52.5%) were in the Medium category, and 12 students (30%) were in the Low category. After the learning interventions in cycle 2, the number of students with High motivation increased to 12 (30%), and the number in the medium category increased to 24 (60%). The Low category decreased to only four students (10%). These changes indicate that the learning approach successfully increased students' motivation to learn and encouraged them to be more enthusiastic, actively participate, and feel more confident and satisfied with the learning process.

Enhancing Students' Speaking Skills

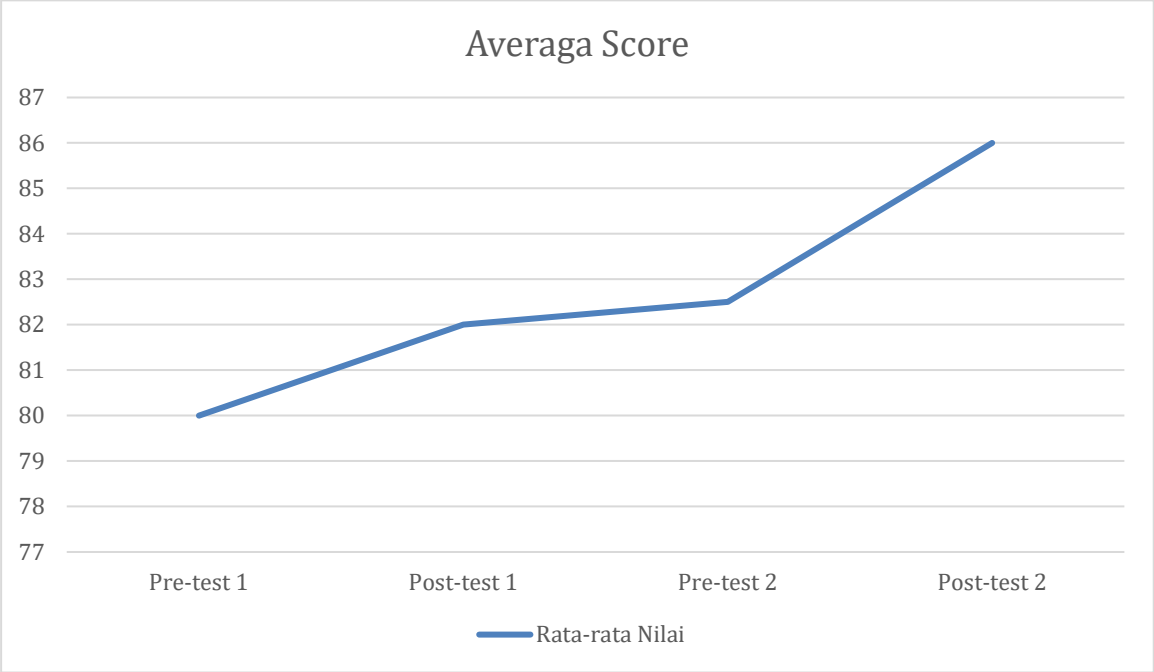






Picture 1. Lesson Menu **Picture 2. Conversation Topic** **Picture 3. Conversation Practice**

Implementing AI-Driven Role-Playing Communicative Learning through the Memrise application has shown significant improvements in students' speaking skills. The learning process is carried out interactively using the MemBot feature (Beta version), which allows students to practice Arabic conversations directly with an artificial intelligence-based virtual assistant. As shown in Figure 3, students engage in various role-playing simulations in different contexts, such as introducing themselves, ordering coffee, or conversing with a stranger at a bus stop. Each scenario requires students to provide structurally correct and pronunciation-correct responses in Arabic. The Memrise application provides automatic feedback in the form of pronunciation corrections, translations, and suggestions for improving sentence structure in real time.



Graph 1. Graph of Student Speaking Ability Improvement

Graph 1 shows an improvement in students' speaking ability, as indicated by pre-test and post-test results collected during the research process. The significant increase in scores from pre-test 2 to post-test 2 indicates that implementing the AI-Driven Role-Playing Communicative Learning strategy can improve student learning outcomes. The average student score increased by 2 points from 80 to 82 in cycle 1 and 3.5 points from 82.5 to 86 in cycle 2. Consistent with Shanahan et al. (2023), this upward trend indicates that students experienced consistent development in their Arabic speaking skills after participating in role-playing-based learning combined with artificial intelligence technology. These results reinforce the finding that the AI-Driven Role-Playing Communicative Learning strategy can improve pronunciation and sentence structure accuracy, as well as students' confidence in oral communication in Arabic.

Discussion

Integrating AI and communicative role-playing-based learning activities through the Memrise application has transformed conventional learning patterns into an immersive digital learning environment. Unlike traditional methods emphasizing memorization and repetition, this AI-based learning model provides a contextual, interactive, and meaningful learning experience (Hehsan, 2022).

In this study, students can use Arabic in real-life situations that mirror their future

professional environments, making learning more natural and communicative. For instance, specifically designed role-play scenarios required nursing students to practice clinical interactions in Arabic, such as conducting an initial patient assessment (Anamnesis), explaining nursing care procedures, or providing health instructions to Arabic-speaking patients. By using AI-driven prompts, students could simulate these high-stakes professional encounters in a safe, digital environment before performing them in class. This direct link between classroom simulation and professional nursing practice demonstrates that the skills learned are not merely theoretical but are highly applicable in daily interactions within a medical context. Consequently, this approach bridges the gap between classroom instruction and the practical demands of the globalized healthcare industry, where digital and linguistic competencies are increasingly intertwined.

The results of this study align with previous research findings demonstrating the effectiveness of role-playing methods in improving foreign language speaking skills. Amin's (2021) study increased the average speaking ability of grade IXE students at MTsN 1 Serang. The findings indicated that applying role-playing methods to grade IXE students at MTsN 1 Serang increased the average speaking ability from 71.88% in the first cycle to 88.28% in the second cycle. Similar results were also obtained in the study by Zulpianto et al. (2024) at MAS Mamba'ul Ulum Jambi, which showed an increase in speaking scores from 62.77 to 84.72 after implementing the role-playing method in Arabic language learning. This comparison reinforces that role-playing-based learning strategies effectively develop students' communicative skills and self-confidence. However, this study makes a new contribution by integrating artificial intelligence technology through the MemBot feature in the Memrise application, which provides adaptive interaction and automated feedback. Thus, this AI-driven role-playing Communicative Learning approach can replicate the success of conventional role-based models. Furthermore, in line with research by Lyu and Salam (2025) that describes AI-based personalized learning, this approach is proven effective through technological support that enables independent, personalized, and more immersive learning.

Implementing the AI-Driven Role-Playing Communicative Learning strategy through the Memrise application can also be reviewed for its relevance to Communicative Language Teaching (CLT) theory. Based on the principles of CLT, which

emphasize meaningful communication (Taridi et al., 2024; Ho, 2020; Xiaoshan, 2011), this study's results indicate that the theory can be effectively applied in the context of artificial intelligence-based learning. The MemBot feature in the Memrise application provides an interactive space that resembles honest communication, where students can practice speaking adaptively, receive direct feedback, and construct meaning through functional language use. Furthermore, AI-based interactions have also been shown to help reduce speaking anxiety that students often experience when learning a foreign language (Ding & Xue, 2025; Taufik et al., 2024). By practicing with a virtual assistant, students can try, make mistakes, and correct them without fear of negative judgment from peers (Ding & Yusof, 2025; Pituxcoosuvarn et al., 2024). This condition positively affects students' fluency, accuracy, and confidence in speaking Arabic.

Overall, the results of this study demonstrate that AI-Driven Role-Playing Communicative Learning supported by the memBot feature in the MemRise application effectively improves students' speaking skills, strengthening their communicative competence and digital literacy. Therefore, this model is recommended as an innovative approach to teaching Arabic in higher education, notably to support active, technology-based learning.

However, this study still has several limitations. First, the model's application was limited to an online learning context with relatively few participants, so generalization of the results requires caution. Second, the short implementation duration does not fully reflect the long-term sustainability of the MemBot feature's effects on speaking skills. Therefore, further research involving a larger sample size, longer learning duration, and a mixed-methods approach is recommended to obtain a more comprehensive picture of the effectiveness of the AI-Driven Role-Playing Communicative Learning model.

CONCLUSION

This research aims to design and evaluate the AI-Driven Role-Playing Communicative Learning model as an innovation in Arabic language learning to improve communication competency, engagement, and learning autonomy. The results reveal three main findings. First, integrating role-playing with artificial intelligence (AI) through applications like Memrise can create an immersive, context-rich learning experience, significantly improving students' speaking skills. Second, this approach

strengthens the relevance of Communicative Language Teaching (CLT) theory in the digital age by emphasizing learning through meaningful interactions, adaptive feedback, and active participation. Third, this model encourages the development of dual competencies in communicative skills and digital literacy, a key requirement of Education 5.0.

From a theoretical perspective, this research expands the application of CLT in the context of innovative technology-based learning. Arabic language educators can apply the results in developing more innovative, personalized, and collaborative learning strategies. Further research is recommended to expand the application of the AI-Driven Role-Playing Communicative Learning model to other language skills —such as reading, writing, and listening —to provide a more comprehensive picture of its effectiveness in developing students' communicative competence. Furthermore, further research can integrate more adaptive and multimodal artificial intelligence technologies to provide a learning experience that is increasingly realistic and responsive to individual needs. Longitudinal studies are also needed to examine the long-term impact of AI-based learning on motivation, learning independence, and language skill retention, thereby informing the design of an innovative, inclusive, and sustainable Arabic language learning ecosystem. Thus, the results of this study confirm that the integration of AI and a communicative approach transforms the way Arabic is learned and prepares students to become independent, creative, and adaptive learners in the 21st-century learning ecosystem.

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