Alibbaa': Jurnal Pendidikan Bahasa Arab
Vol. 7 No. 1, January 2026
P-ISSN: 2721-1606 | E-ISSN: 2716-4985
doi: https://doi.org/10.19105/ajpba.v7i1.22619

AI-Augmented Game-Based Learning for Enhancing Arabic Speaking Skills: Evidence from a Quasi-Experimental Study

Mustaghfirin[1], **Masrun**[2], **Rusdi**[3]
[1,2,3]*Universitas Islam Negeri Sultan Syarif Kasim Riau, Indonesia*
Corresponding E-mail: firinfr2@gmail.com

Abstract

This study investigates the effectiveness of *AI-augmented game-based learning* in enhancing Arabic speaking skills (*maharah kalām*) among junior secondary students. Employing a quasi-experimental design with a pretest–posttest control group, the study was conducted at SMP Islam Baitul Qur'an Riau involving 40 students divided into an experimental group and a control group. The experimental group received Arabic speaking instruction through a *Truth or Dare* game designed with instructional support from artificial intelligence, while the control group followed conventional instruction. Data were collected through speaking tests and analyzed using paired-samples and independent-samples *t*-tests. The findings reveal that both groups showed improvement; however, the experimental group demonstrated a significantly higher increase in speaking performance than the control group. These results indicate that integrating game-based learning with AI-supported instructional design can create a more interactive and communicative learning environment, thereby effectively improving Arabic speaking skills.

Keywords: *Arabic speaking skills, game-based learning, artificial intelligence, quasi-experimental study*

Abstrak

Penelitian ini bertujuan untuk menguji efektivitas *AI-augmented game-based learning* dalam meningkatkan keterampilan berbicara bahasa Arab (*maharah kalām*) peserta didik sekolah menengah pertama. Penelitian menggunakan desain kuasi-eksperimen dengan pretest–posttest kelompok kontrol dan dilaksanakan di SMP Islam Baitul Qur'an Riau dengan melibatkan 40 peserta didik yang dibagi ke dalam kelompok eksperimen dan kelompok kontrol. Kelompok eksperimen mengikuti pembelajaran berbicara bahasa Arab melalui permainan *Truth or Dare* yang dirancang dengan dukungan kecerdasan buatan, sedangkan kelompok kontrol mengikuti pembelajaran konvensional. Data dikumpulkan melalui tes keterampilan berbicara dan dianalisis menggunakan uji *paired-samples* dan *independent-samples t-test*. Hasil penelitian menunjukkan bahwa kedua kelompok mengalami peningkatan, namun peningkatan pada kelompok eksperimen secara signifikan lebih tinggi dibandingkan kelompok kontrol. Temuan ini menunjukkan bahwa integrasi pembelajaran berbasis permainan dengan dukungan AI efektif dalam meningkatkan keterampilan berbicara bahasa Arab.

Kata Kunci: *keterampilan berbicara bahasa Arab, pembelajaran berbasis permainan, kecerdasan buatan, kuasi-eksperimen*

Introduction

Speaking skill development constitutes one of the major challenges in foreign language education across diverse global contexts. Unlike receptive skills, speaking requires learners to produce language spontaneously,[1] manage linguistic and affective elements simultaneously, and engage directly in authentic communicative situations.[2] Numerous international studies indicate that foreign language learners frequently experience speaking anxiety,[3] low self-confidence, and limited opportunities for oral practice, which ultimately

[1] Chen, Yi-chen. "Effects of Technology-Enhanced Language Learning on Reducing EFL Learners' Public Speaking Anxiety." *Computer Assisted Language Learning* 37, no. 4 (May 2024): 789–813. https://doi.org/10.1080/09588221.2022.2055083.

[2] Hadi, Nurul, Nuri Alvina, and Khaled Radhouani. "Ta'zîzu Dâfi'iyyati Thullâbi Riyâdh al-Athfâl Li Tathwîri Mahârât al-Lughah al-'Arabiyyah al-Syafawiyyah Min Khilâli Barâmiji al-Ta'lîm al-Mukatstsaf." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 5, no. 2 (July 2024): 189–214. https://doi.org/10.19105/ajpba.v5i2.12195.

[3] Icha Gilang Permata, Icha Gilang Permata, and Machrup Eko Cahyono. "Implications of Social Anxiety Disorder on the Improvement of Maharah Al-Kalam Arabic Students." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 4, no. 2 (July 2023): 124–47. https://doi.org/10.19105/ajpba.v4i2.8877.

result in low levels of speaking fluency and accuracy.[4] Therefore, the development of speaking skills cannot be separated from efforts to create learning environments that are communicative, participatory, and supportive of active learner engagement.[5]

These global challenges are also reflected in the teaching of Arabic as a foreign language. In many educational institutions, Arabic instruction tends to emphasize vocabulary acquisition and grammatical structures, while speaking skills often receive insufficient attention.[6] As a result, learners acquire linguistic knowledge in a passive manner but encounter difficulties in actualizing it through oral communication. This condition indicates that *maharah kalām* instruction should be understood as a pedagogical process that requires instructional designs capable of facilitating interaction, fostering speaking confidence, and promoting meaningful language use.

These issues are clearly evident in the context of Arabic language learning at SMP Islam Baitul Qur'an Riau, which serves as the research site of this study. Based on preliminary observations and existing classroom practices, students' Arabic speaking skills remain relatively low despite their formal exposure to Arabic instruction. Students tend to be passive during speaking activities, hesitate to express ideas orally, and frequently rely on their first language during classroom interactions. Teacher-centered instructional approaches further limit students' opportunities to practice speaking spontaneously and communicatively. Consequently, these conditions negatively affect students' confidence and fluency in Arabic oral communication.

A number of previous studies have examined the development of speaking skills in foreign language learning from the perspectives of

---

[4] Hasanah, Mamluatul, Ahmad Mubaligh, Risna Rianti Sari, Alfiatus Syarofah, and Agung Prasetyo. "ARABIC PERFORMANCE CURRICULLUM DEVELOPMENT: RECONSTRUCTION BASED ON ACTFL AND DOUGLAS BROWN PERSPECTIVE." *Ijaz Arabi Journal of Arabic Learning* 4, no. 3 (October 2021). https://doi.org/10.18860/ijazarabi.v4i3.11900.

[5] Nanda Siska Safitri, Mohammad Rofiqi, Muhajir, Boby Bagas Purnama, and Shosita Manrova. "TOAFL.Com: A CEFR-Based Simulation Platform for Learning Al-Arabiyah Lil Akadimiyah Among Indonesian Students." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 6, no. 1 (January 2025): 1–22. https://doi.org/10.19105/ajpba.v6i1.17201.

[6] Albantani, Azkia Muharom, and Ahmad Madkur. "Teaching Arabic in the Era of Industrial Revolution 4.0 in Indonesia: Challenges and Opportunities." *ASEAN Journal of Community Engagement* 3, no. 2 (December 2019). https://doi.org/10.7454/ajce.v3i2.1063.

educational technology, affective factors, and game-based pedagogical approaches. One relevant study investigated the impact of computer-assisted language learning (CALL) on vocabulary mastery, speaking skills, and speaking anxiety among Indonesian EFL learners. Using a pretest–posttest control group experimental design, the study demonstrated that learners who participated in technology-assisted instruction achieved significantly higher speaking performance and experienced reduced speaking anxiety compared to those in conventional learning settings. These findings confirm that the integration of technology into language learning can positively contribute to both linguistic and affective dimensions of speaking development.[7]

In the context of Arabic language learning, other studies have highlighted speaking anxiety as a critical issue among secondary school students learning Arabic as a foreign language. Using a descriptive quantitative approach with the Foreign Language Classroom Anxiety Scale (FLCAS), these studies found that speaking anxiety substantially affects students' participation and performance in Arabic language classrooms. Although such studies did not propose specific pedagogical interventions, their findings underscore the urgency of developing instructional strategies that create more supportive learning environments and reduce affective barriers in *maharah kalām* instruction.[8]

Game-based learning approaches in Arabic language education have also been explored through the development of educational game modules. These studies focus on the design and implementation of edutainment-based instructional modules to enhance students' vocabulary acquisition and speaking skills. The findings indicate that learners respond positively to game-based media and perceive benefits in supporting Arabic speaking activities.[9] However, because these

---

[7] Hanafiah, Waode, Muhammad Aswad, Harlinah Sahib, Abdul Hakim Yassi, and Movahede Sadat Mousavi. "The Impact of CALL on Vocabulary Learning, Speaking Skill, and Foreign Language Speaking Anxiety: The Case Study of Indonesian EFL Learners." *Education Research International* 2022 (January 2022): 1–13. https://doi.org/10.1155/2022/5500077.

[8] Mohamed Mokhtar, Mohd Ieruwan. "Lower Secondary Students' Arabic Speaking Anxiety: A Foreign Language Literacy Perspective." *International Journal of Education and Literacy Studies* 8, no. 4 (October 2020): 33. https://doi.org/10.7575/aiac.ijels.v.8n.4p.33.

[9] Md Noor, Mohamad Lukman Al Hakim bin, Muhamad Zamri bin Abdul Gani, Nur Shuhadak Binti Ismail, Nor Zahidah binti Ahmad, Khairunnisa Mohd, and Jamsuri Mohd. Shamsudin. "Implementing Arabic Educational Charade Game in

studies primarily adopt developmental approaches and emphasize learner perceptions, the effectiveness of speaking skill improvement has not been empirically tested through rigorous experimental designs. Nevertheless, these studies reinforce the argument that games can be pedagogically designed to support *maharah kalām* instruction.

Other research has examined the use of digital games in Arabic language learning by exploring commercial games as learning environments. Using qualitative descriptive approaches, these studies suggest that Arabic language use within game interactions has the potential to support the development of listening, speaking, and reading skills. Such findings indicate that digital games can provide authentic communicative contexts for Arabic learners.[10] However, because the games are not specifically designed for instructional purposes and learning outcomes are not measured quantitatively, their pedagogical effectiveness requires further empirical validation.

From a theoretical perspective, studies on game-based learning have analyzed gamification design in language learning applications using frameworks such as mechanics, dynamics, and aesthetics (MDA). These studies demonstrate that gamification features, such as meaningful practice, social interaction, and reward systems, play a crucial role in enhancing learner engagement and positive attitudes toward language learning.[11] Although these studies focus primarily on vocabulary learning rather than speaking skills, they provide a strong conceptual foundation for understanding how well-structured game designs can create more active and meaningful language learning experiences.

Taken together, these studies indicate that educational technology and game-based approaches possess significant pedagogical potential in supporting language learning. However, critical examination of previous research reveals several important gaps that remain to be

---

Acquiring Arabic Vocabulary and Improving Arabic Speaking Skill." *International Journal of Academic Research in Business and Social Sciences* 13, no. 6 (June 2023). https://doi.org/10.6007/IJARBSS/v13-i6/17406.

[10] Husna, Ilya, Zikrawahyuni Maiza, Suci Ramadhanti Febriani, Rahmat Satria Dinata, and Fauzul Fil Amri. "Digital Game-Based Learning: Exploring the Use of Mobile Legends in Arabic Language Skills." *Al-Ta'rib : Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya* 12, no. 1 (June 2024): 1–16. https://doi.org/10.23971/altarib.v12i1.8015.

[11] Gao, Ya, and Lin Pan. "Learning English Vocabulary through Playing Games: The Gamification Design of Vocabulary Learning Applications and Learner Evaluations." *The Language Learning Journal* 51, no. 4 (July 2023): 451–71. https://doi.org/10.1080/09571736.2023.2217828.

addressed. First, most game-based learning studies emphasize learner motivation or general learning outcomes, while empirical investigations specifically examining speaking skill development using quasi-experimental designs remain limited. Second, research on artificial intelligence in language learning has largely focused on digital tools such as chatbots, automated assessment systems, or online learning platforms, with limited attention to AI as a support for designing face-to-face instructional activities oriented toward oral interaction. Third, in the context of Arabic language learning in Islamic secondary schools—such as SMP Islam Baitul Qur'an Riau—studies integrating game-based learning with AI support to develop *maharah kalām* remain scarce, particularly those supported by classroom-based quantitative evidence.

Addressing these research gaps, the present study offers a novel contribution by integrating a game-based learning approach with AI-supported instructional design in *maharah kalām* instruction. The novelty of this study lies in the use of AI as a pedagogical support tool to design a structured *Truth or Dare* game aligned with students' proficiency levels. This approach is conceptualized as *AI-augmented game-based learning*, in which AI functions to enhance the effectiveness of game-based instructional design rather than serving as the primary research variable. In addition, from a methodological standpoint, this study contributes novelty through the application of a quasi-experimental design to examine the effectiveness of this approach within the context of Arabic language learning in an Islamic secondary school.

In line with these objectives, this study seeks to address the following research questions: (1) Is the implementation of *AI-augmented game-based learning* through the *Truth or Dare* game effective in improving students' Arabic speaking skills? (2) How does the improvement in speaking skills differ between students who participate in *Truth or Dare* game-based learning supported by AI-assisted instructional design and those who receive conventional instruction?

Method

Research Design

This study employed a quantitative approach using a quasi-experimental design, specifically a pretest-posttest control group design.[12] This design was selected to examine the effectiveness of

[12] Janssen, Jeroen, and Ingo Kollar. "Experimental and Quasi-Experimental Research in CSCL." In *International Handbook of Computer-Supported Collaborative*

implementing *AI-augmented game-based learning* through the *Truth or Dare* game in improving students' Arabic speaking skills. Two groups were involved in the study: an experimental group that received game-based instruction through the *Truth or Dare* game designed with AI support, and a control group that followed conventional Arabic language instruction. Both groups were administered a pretest and a posttest to measure changes in speaking skills following the instructional intervention.

Participants and Research Site

The study was conducted at SMP Islam Baitul Qur'an Riau. The participants were junior secondary school students enrolled in Arabic language classes during the semester in which the research was carried out. The experimental and control groups were determined based on existing classes (*intact groups*), and individual randomization was not performed. The selection of a quasi-experimental design was based on the natural classroom setting and the practical limitations of conducting full randomization within a school context.

Instructional Procedures

The research was implemented through three main stages: preparation, implementation, and evaluation. During the preparation stage, instructional materials were developed, including the design of *Truth or Dare* game activities aligned with the learning objectives of *maharah kalām*. At this stage, AI was utilized as an instructional design support tool, particularly to assist in developing and organizing *Truth* and *Dare* prompts according to students' proficiency levels and relevant communicative contexts. The use of AI was limited to the material design stage and did not involve assessment or data collection processes.

During the implementation stage, the experimental group participated in Arabic speaking instruction through the *Truth or Dare* game integrated into classroom activities. Students were required to respond to questions or perform speaking challenges orally according to the game rules, thereby encouraging active participation, speaking confidence, and peer interaction. In contrast, the control group received conventional Arabic language instruction that focused on teacher explanations and limited speaking practice without the use of game-based activities. All instructional sessions for both groups were

Learning, 497–515. Cham: Springer International Publishing, 2021. https://doi.org/10.1007/978-3-030-65291-3_27.

conducted by the Arabic language teacher in accordance with the regular class schedule.

Research Instruments

The primary instrument used in this study was an Arabic speaking skills test, administered as both the pretest and posttest. The speaking test was designed to measure students' ability to express ideas orally in Arabic, encompassing aspects such as fluency, pronunciation accuracy, vocabulary use, and grammatical accuracy. The instrument was developed based on speaking skill indicators aligned with the curriculum and learning objectives and was validated prior to its use in the study. Speaking performance was assessed manually by the teacher and the researcher using the same scoring rubric for both the pretest and posttest to ensure assessment consistency.

Data Collection and Analysis Techniques

Research data were obtained from the pretest and posttest scores of Arabic speaking skills in both the experimental and control groups. The collected data were analyzed using IBM SPSS Statistics. Data analysis began with prerequisite tests, including tests of normality and homogeneity, to ensure that the data met the required statistical assumptions. Subsequently, comparative analyses were conducted to examine improvements in speaking skills within each group and differences in improvement between the experimental and control groups. A paired-samples *t*-test was used to analyze differences between pretest and posttest scores within each group, while an independent-samples *t*-test was employed to compare posttest scores between the experimental and control groups. Hypothesis testing was conducted at a 0.05 significance level to determine whether the implementation of *AI-augmented game-based learning* through the *Truth or Dare* game had a significant effect on improving students' Arabic speaking skills.

Results and Discussion

Data on Arabic speaking skills were obtained from the pretest and posttest scores of the experimental and control groups at SMP Islam Baitul Qur'an Riau, each consisting of 20 students. Descriptive statistics were used to illustrate changes in speaking skill scores before and after the instructional intervention in both groups.

Table 1. Descriptive Statistics of Pretest and Posttest

Group	Test	Mean	Standard Deviation
Experimental	Pretest	63.85	7.04
Experimental	Posttest	79.80	2.71
Control	Pretest	65.65	7.70
Control	Posttest	77.50	4.08

The table indicates that prior to the intervention, the Arabic speaking abilities of students in the experimental and control groups were relatively comparable. After the intervention, both groups showed improvement in speaking scores, with a greater increase observed in the experimental group. The decrease in the standard deviation of the experimental group's posttest scores suggests that students' speaking performance became more evenly distributed after the intervention.

At the initial stage of instruction, most students at SMP Islam Baitul Qur'an Riau tended to be passive during Arabic speaking activities. Students appeared hesitant to respond orally and frequently relied on their first language during classroom interactions. Following the implementation of the *Truth or Dare* game-based learning approach in the experimental group, students demonstrated more active participation in speaking activities, increased willingness to speak, and greater engagement in peer interactions throughout the learning process.

To examine improvements in speaking skills within each group, a paired-samples *t*-test was conducted to compare pretest and posttest scores in both the experimental and control groups.

Table 2. Results of the Paired-Samples t-Test

Group	t	df	Sig. (2-tailed)
Experimental (Pretest–Posttest)	10.313	19	0.000
Control (Pretest–Posttest)	5.405	19	0.000

The results of the paired-samples *t*-test indicate significant differences between pretest and posttest scores in both groups. The *t* value of the experimental group is higher than that of the control group, indicating a stronger improvement in speaking skills among students who participated in the game-based learning intervention.

During the implementation of instruction in the experimental group, students became increasingly accustomed to using Arabic within the context of the game. Speaking activities occurred more naturally, with students responding orally to challenges and questions posed by their peers. In contrast, although the control group also showed improvement in speaking skills, speaking activities remained dominated

by brief responses and largely one-way interactions between the teacher and students.

Differences in speaking skills between the experimental and control groups after the intervention were analyzed using an independent-samples *t*-test based on posttest scores.

Table 3. Results of the Independent-Samples t-Test for Posttest Scores

Statistic	Value
Levene's Test (F)	4.893
Sig. Levene's Test	0.033
t	2.099
df	38
Sig. (2-tailed)	0.043
Mean Difference	2.300
95% CI	0.082 – 4.518

The results indicate a statistically significant difference between the posttest scores of the experimental and control groups. The mean score of the experimental group was higher than that of the control group, demonstrating the effectiveness of *AI-augmented game-based learning* in improving students' Arabic speaking skills.

Overall, students in the experimental group showed greater confidence and more consistent participation in speaking activities compared to those in the control group. Peer interactions were more intensive, and the use of Arabic within the learning context became more dominant. Such conditions were not observed as strongly in the control group, where student participation in speaking activities remained relatively limited.

The findings indicate that students' Arabic speaking skills at SMP Islam Baitul Qur'an Riau improved following instruction. However, the improvement among students who participated in *AI-augmented game-based learning* through the *Truth or Dare* game was statistically more significant and supported by a more active and participatory learning environment compared to the control group.

Discussion

The findings of this study demonstrate that the implementation of *AI-augmented game-based learning* through the *Truth or Dare* game had a significant impact on improving students' Arabic speaking skills at SMP Islam Baitul Qur'an Riau. This conclusion is supported by the results of the paired-samples *t*-test, which revealed significant

improvements in speaking skills within the experimental group, as well as by the independent-samples *t*-test, which confirmed a significant difference between the experimental and control groups' posttest scores. Empirically, these findings affirm that game-based learning designed in a structured manner and supported by technology is more effective than conventional instruction in developing *maharah kalām*.

These results are consistent with a growing body of research emphasizing the role of educational technology in enhancing foreign language speaking skills and reducing affective barriers among learners. When technology is positioned as a pedagogical support tool, it can foster a more interactive and supportive learning environment,[13] thereby encouraging learners to actively use the target language orally.[14] In this study, AI served as an instructional design support, enabling the development of speaking activities that were more structured and aligned with students' proficiency levels. AI was utilized to assist teachers in designing graduated, contextual, and goal-oriented speaking prompts and challenges without replacing the teacher's pedagogical role in the classroom, as AI in language learning is more effective when positioned as an instructional design aid that supports pedagogical decision-making rather than as a substitute for human interaction in teaching and learning processes.[15]

Beyond technological aspects, the findings also highlight the importance of affective factors in Arabic speaking instruction. Positive affective conditions contribute directly to students' willingness to participate and to use Arabic orally.[16] Previous studies have shown that

[13] Mubarok, Faiz Ushbah, and Atiqah Nurul Asri. "The Benefits of Android Applications for an Independent Learning in Learning English Language." *Journal of Language, Literature, and English Teaching (JULIET)* 2, no. 2 (September 2021): 8–15. https://doi.org/10.31629/juliet.v2i2.3692.

[14] Khuluq, Muchsinul, Mamluatul Hasanah, Muasshomah Muasshomah, and Nurul Imamah. "Mobile-Assisted Language Learning Apps: The Analysis of Duolingo." *Al-Ta'rib : Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya* 12, no. 2 (December 2024): 229–46. https://doi.org/10.23971/altarib.v12i2.8806.

[15] Wayne Holmes, Maya Bialik, and Maya Bialik. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston: Center for Curriculum Redesign, 2019.

[16] Huseinović, Lamija. "The Effects of Gamification On Student Motivation And Achievement In Learning English As A Foreign Language In Higher Education."

speaking anxiety is a major barrier affecting learners' oral participation and performance.[17] In the context of this study, the *Truth or Dare* game created a more relaxed, participatory, and low-pressure learning environment. Such supportive conditions enabled students to express themselves more freely and confidently, particularly when articulating ideas through speaking,[18] as reflected in the improved scores of the experimental group.

From a game-based pedagogical perspective, the findings reinforce the view that educational games can function as effective instructional strategies for developing speaking skills. Games designed with clear pedagogical objectives provide meaningful communicative contexts, promote peer interaction,[19] and facilitate spontaneous speaking practice. The systematic integration of games such as *Truth or Dare* into classroom instruction allows students to engage actively in using Arabic, resulting in a more communicative and learner-centered learning process.[20]

Nevertheless, this study has several limitations that should be acknowledged. First, the quasi-experimental design involved a relatively small sample size and was conducted in a single educational institution, which limits the generalizability of the findings to broader Arabic language learning contexts with diverse learner characteristics and environments. Second, the duration of the game-based intervention was relatively short, and thus the study did not examine the long-term effects

---

MAP Education and Humanities 4, no. 1 (July 2023): 10–36. https://doi.org/10.53880/2744-2373.2023.4.10.

[17] Li, Chengchen, and Li Wei. "Anxiety, Enjoyment, and Boredom in Language Learning amongst Junior Secondary Students in Rural China: How Do They Contribute to L2 Achievement?" *Studies in Second Language Acquisition* 45, no. 1 (March 2023): 93–108. https://doi.org/10.1017/S0272263122000031.

[18] Papi, Mostafa, and Gholam Hassan Khajavy. "Motivational Mechanisms Underlying Second Language Achievement: A Regulatory Focus Perspective." *Language Learning* 71, no. 2 (June 2021): 537–72. https://doi.org/10.1111/lang.12443.

[19] Zhang, Qi, and Zhonggen Yu. "Meta-Analysis on Investigating and Comparing the Effects on Learning Achievement and Motivation for Gamification and Game-Based Learning." *Education Research International* 2022 (August 2022): 1–19. https://doi.org/10.1155/2022/1519880.

[20] Thurairasu, Vanitha. "Gamification-Based Learning as The Future of Language Learning: An Overview." *European Journal of Humanities and Social Sciences* 2, no. 6 (November 2022): 62–69. https://doi.org/10.24018/ejsocial.2022.2.6.353.

of *AI-augmented game-based learning* on the development of speaking skills.

Third, the assessment of speaking skills focused primarily on observable speaking performance based on oral tests and did not explore other dimensions such as linguistic complexity, communication strategies, or changes in students' speaking anxiety levels. In addition, although AI was employed as a support tool in instructional design, the study did not directly compare instructional designs with and without AI support, meaning that the specific contribution of AI to learning outcomes remains inferential.

Considering these limitations, future research is recommended to involve larger and more diverse samples, apply more rigorous experimental designs, and examine the long-term impacts of AI-supported game-based learning. Further studies may also explore affective and cognitive dimensions in greater depth and compare different types of games and levels of technological integration to gain a more comprehensive understanding of *maharah kalām* development through innovative instructional approaches.

Conclusion

This study concludes that the implementation of *AI-augmented game-based learning* through the *Truth or Dare* game is effective in improving students' Arabic speaking skills at SMP Islam Baitul Qur'an Riau. This finding addresses the first research question by demonstrating a significant improvement in speaking skills among students who participated in game-based learning designed with AI support. Furthermore, the comparison between groups addresses the second research question by showing that the improvement in speaking skills in the experimental group was statistically higher than that of the control group, which followed conventional instruction. Overall, these findings confirm that systematically designed game-based learning supported by technology as a pedagogical tool can create a more communicative, participatory, and conducive learning environment for the development of *maharah kalām*, while also reinforcing students' roles as active agents in the Arabic language learning process.

Nevertheless, this study has several limitations that should be considered when interpreting the findings. The research was conducted

in a single educational institution with a relatively small sample size and a short duration of instructional implementation, which limits the generalizability of the results to broader Arabic language learning contexts. In addition, the study focused on measuring speaking performance and did not examine affective or cognitive dimensions in depth, nor did it investigate the long-term effects of *AI-augmented game-based learning*. Therefore, future research is recommended to involve more diverse samples, employ more rigorous experimental designs, and explore the role of AI more explicitly in supporting game-based instructional design. Further studies may also develop a wider range of games and examine their integration with other language skills to enrich understanding of technology-supported and innovative approaches in Arabic language education.

REFERENCES

Albantani, Azkia Muharom, and Ahmad Madkur. "Teaching Arabic in the Era of Industrial Revolution 4.0 in Indonesia: Challenges and Opportunities." *ASEAN Journal of Community Engagement* 3, no. 2 (December 2019). https://doi.org/10.7454/ajce.v3i2.1063.

Chen, Yi-chen. "Effects of Technology-Enhanced Language Learning on Reducing EFL Learners' Public Speaking Anxiety." *Computer Assisted Language Learning* 37, no. 4 (May 2024): 789–813. https://doi.org/10.1080/09588221.2022.2055083.

Gao, Ya, and Lin Pan. "Learning English Vocabulary through Playing Games: The Gamification Design of Vocabulary Learning Applications and Learner Evaluations." *The Language Learning Journal* 51, no. 4 (July 2023): 451–71. https://doi.org/10.1080/09571736.2023.2217828.

Hadi, Nurul, Nuri Alvina, and Khaled Radhouani. "Ta'zîzu Dâfi'iyyati Thullâbi Riyâdh al-Athfâl Li Tathwîri Mahârât al-Lughah al-'Arabiyyah al-Syafawiyyah Min Khilâli Barâmiji al-Ta'lîm al-Mukatstsaf." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 5, no. 2 (July 2024): 189–214. https://doi.org/10.19105/ajpba.v5i2.12195.

Hanafiah, Waode, Muhammad Aswad, Harlinah Sahib, Abdul Hakim Yassi, and Movahede Sadat Mousavi. "The Impact of CALL on Vocabulary Learning, Speaking Skill, and Foreign Language Speaking Anxiety: The Case Study of Indonesian EFL Learners." *Education Research International* 2022 (January 2022): 1–13. https://doi.org/10.1155/2022/5500077.

Hasanah, Mamluatul, Ahmad Mubaligh, Risna Rianti Sari, Alfiatus Syarofah, and Agung Prasetyo. "Arabic Performance Curriculum Development: Reconstruction Based on ACTFL and Douglas Brown Perspective." *Ijaz Arabi Journal of Arabic Learning* 4, no. 3 (October 2021). https://doi.org/10.18860/ijazarabi.v4i3.11900.

Holmes, Wayne, Maya Bialik, and Maya Fadel. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston: Center for Curriculum Redesign, 2019.

Huseinović, Lamija. "The Effects of Gamification on Student Motivation and Achievement in Learning English as a Foreign Language in Higher Education." *MAP Education and Humanities*

4, no. 1 (July 2023): 10–36. https://doi.org/10.53880/2744-2373.2023.4.10.

Husna, Ilya, Zikrawahyuni Maiza, Suci Ramadhanti Febriani, Rahmat Satria Dinata, and Fauzul Fil Amri. "Digital Game-Based Learning: Exploring the Use of Mobile Legends in Arabic Language Skills." *Al-Ta'rib: Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya* 12, no. 1 (June 2024): 1–16. https://doi.org/10.23971/altarib.v12i1.8015.

Janssen, Jeroen, and Ingo Kollar. "Experimental and Quasi-Experimental Research in CSCL." In *International Handbook of Computer-Supported Collaborative Learning*, edited by Ulrike Cress et al., 497–515. Cham: Springer International Publishing, 2021. https://doi.org/10.1007/978-3-030-65291-3_27.

Khuluq, Muchsinul, Mamluatul Hasanah, Muasshomah Muasshomah, and Nurul Imamah. "Mobile-Assisted Language Learning Apps: The Analysis of Duolingo." *Al-Ta'rib: Jurnal Ilmiah Program Studi Pendidikan Bahasa Arab IAIN Palangka Raya* 12, no. 2 (December 2024): 229–46. https://doi.org/10.23971/altarib.v12i2.8806.

Li, Chengchen, and Li Wei. "Anxiety, Enjoyment, and Boredom in Language Learning amongst Junior Secondary Students in Rural China: How Do They Contribute to L2 Achievement?" *Studies in Second Language Acquisition* 45, no. 1 (March 2023): 93–108. https://doi.org/10.1017/S0272263122000031.

Md Noor, Mohamad Lukman Al Hakim bin, Muhamad Zamri bin Abdul Gani, Nur Shuhadak Binti Ismail, Nor Zahidah binti Ahmad, Khairunnisa Mohd, and Jamsuri Mohd Shamsudin. "Implementing Arabic Educational Charade Game in Acquiring Arabic Vocabulary and Improving Arabic Speaking Skill." *International Journal of Academic Research in Business and Social Sciences* 13, no. 6 (June 2023). https://doi.org/10.6007/IJARBSS/v13-i6/17406.

Mokhtar, Mohamed, and Mohd Ieruwan. "Lower Secondary Students' Arabic Speaking Anxiety: A Foreign Language Literacy Perspective." *International Journal of Education and Literacy Studies* 8, no. 4 (October 2020): 33. https://doi.org/10.7575/aiac.ijels.v.8n.4p.33.

Mubarok, Faiz Ushbah, and Atiqah Nurul Asri. "The Benefits of Android Applications for an Independent Learning in Learning English Language." *Journal of Language, Literature, and English Teaching (JULIET)* 2, no. 2 (September 2021): 8–15. https://doi.org/10.31629/juliet.v2i2.3692.

Papi, Mostafa, and Gholam Hassan Khajavy. "Motivational Mechanisms Underlying Second Language Achievement: A Regulatory Focus Perspective." *Language Learning* 71, no. 2 (June 2021): 537–72. https://doi.org/10.1111/lang.12443.

Permata, Icha Gilang, and Machrup Eko Cahyono. "Implications of Social Anxiety Disorder on the Improvement of Maharah al-Kalam Arabic Students." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 4, no. 2 (July 2023): 124–47. https://doi.org/10.19105/ajpba.v4i2.8877.

Safitri, Nanda Siska, Mohammad Rofiqi, Muhajir, Boby Bagas Purnama, and Shosita Manrova. "TOAFL.com: A CEFR-Based Simulation Platform for Learning al-'Arabiyah lil Akadimiyah among Indonesian Students." *Alibbaa': Jurnal Pendidikan Bahasa Arab* 6, no. 1 (January 2025): 1–22. https://doi.org/10.19105/ajpba.v6i1.17201.

Thurairasu, Vanitha. "Gamification-Based Learning as the Future of Language Learning: An Overview." *European Journal of Humanities and Social Sciences* 2, no. 6 (November 2022): 62–69. https://doi.org/10.24018/ejsocial.2022.2.6.353.

Zhang, Qi, and Zhonggen Yu. "Meta-Analysis on Investigating and Comparing the Effects on Learning Achievement and Motivation for Gamification and Game-Based Learning." *Education Research International* 2022 (August 2022): 1–19. https://doi.org/10.1155/2022/1519880.