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The Effect of Game-Based Learning Strategies on Arabic Vocabulary Acquisition and Speaking Skills among Male Undergraduate Students

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Abstract:
This study investigates the effectiveness of game-based learning strategies in improving Arabic vocabulary acquisition and speaking skills among undergraduate learners. The research aimed to examine how crossword puzzles, Quizizz-based formative assessment, and word-guessing games influence vocabulary mastery, speaking performance, and learner engagement. A Classroom Action Research design was employed involving 30 male undergraduate students aged 18–22 years, using two iterative cycles of planning, action, observation, and reflection. Data were collected through vocabulary tests, speaking assessments, Quizizz performance records, observation sheets, and questionnaires. The findings revealed significant improvement in vocabulary scores from 52.4 to 78.6 ($p < 0.001$) and speaking performance from 5.2 to 7.8, with engagement rising from 40% to 75%. The study contributes to language pedagogy by demonstrating the synergistic effect of integrated game-based strategies in enhancing linguistic competence and reducing speaking anxiety. It implies that structured game-based instruction can be effectively applied in Arabic language classrooms to improve learning outcomes and student motivation.
Keywords: *Game-Based Learning; Arabic Vocabulary; Speaking Skills; Classroom Action Research*

Abstrak:
Penelitian ini mengkaji efektivitas strategi pembelajaran berbasis permainan dalam meningkatkan penguasaan kosakata dan keterampilan berbicara bahasa Arab pada mahasiswa sarjana. Tujuan penelitian adalah untuk menganalisis pengaruh crossword puzzle, evaluasi berbasis Quizizz, dan permainan tebak kata terhadap peningkatan kosakata, kemampuan berbicara, dan keterlibatan belajar mahasiswa. Penelitian ini menggunakan desain Classroom Action Research yang melibatkan 30 mahasiswa laki-laki usia 18–22 tahun melalui dua siklus pembelajaran yang terdiri dari perencanaan, tindakan, observasi, dan refleksi. Data dikumpulkan melalui tes kosakata, tes berbicara, hasil Quizizz, lembar observasi, dan angket. Hasil penelitian menunjukkan peningkatan signifikan skor kosakata dari 52,4 menjadi 78,6 ($p < 0,001$) serta keterampilan berbicara dari 5,2 menjadi 7,8, dengan peningkatan keterlibatan dari 40% menjadi 75%. Penelitian ini berkontribusi pada pengembangan pembelajaran bahasa dengan menunjukkan efektivitas integrasi strategi permainan dalam meningkatkan kemampuan linguistik dan menurunkan kecemasan berbicara.
Kata Kunci: *Pembelajaran Berbasis Permainan; Kosakata Bahasa Arab; Keterampilan Berbicara; Penelitian Tindakan Kelas*

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INTRODUCTION

Arabic language instruction in non-Arabic-speaking contexts continues to face persistent challenges, particularly in developing vocabulary mastery and oral communication. University students often encounter difficulties in retaining newly learned lexical items and using them spontaneously in spoken interaction (Alderbashi et al., 2020; Lee et al., 2021; Solimando, 2022). These difficulties are frequently associated with limited authentic language exposure, low opportunities for meaningful practice, and the continued dominance of teacher-centered instructional approaches. Such conditions may reduce learner engagement, increase speaking anxiety, and produce passive classroom participation, ultimately limiting language development (Alahmadi et al., 2020; Ouardi, 2022).

Recent developments in language pedagogy have emphasized the importance of interactive and student-centered learning environments that promote active participation and meaningful language use. Within this perspective, game-based learning has gained increasing attention as a pedagogical strategy capable of integrating cognitive engagement, social interaction, and intrinsic motivation (Altakhaineh et al., 2025; Chen & Wu, 2023; Parvez et al., 2023). By transforming learning activities into purposeful and enjoyable tasks, game-based instruction can create a low-pressure atmosphere that encourages students to experiment with language, take risks, and participate more confidently in classroom communication (Nadolny et al., 2020; Rulyansah et al., 2023).

Previous studies have reported positive effects of game-based learning on Arabic language instruction. Crossword puzzle activities have been shown to strengthen vocabulary retention through active recall, contextual problem-solving, and repeated lexical exposure (Crosswell, 2020; Slater et al., 2022). Likewise, digital platforms such as Quizizz have been found to provide interactive formative assessment, immediate feedback, and greater learner engagement during vocabulary review (Coa et al., 2023; Pham, 2022). In speaking instruction, word-guessing games have demonstrated potential to reduce anxiety, stimulate spontaneous oral production, and improve learners' fluency in communicative tasks (Dextre et al., 2022; Handoko et al., 2021; Ordu et al., 2023). These findings indicate that game-oriented activities may support both receptive and productive dimensions of Arabic learning.

Although previous studies have confirmed the pedagogical value of game-based learning, much of the existing literature has focused primarily on school-level learners and has often examined single instructional techniques in relatively short-term interventions (Hursen, 2021; Nuraini et al., 2020). Limited attention has been given to the implementation of integrated game-based strategies in higher education settings, particularly among undergraduate learners who possess prior exposure to Arabic but continue to experience challenges in vocabulary consolidation and spoken performance. Moreover, there remains a need for classroom-based inquiry that not only measures learning outcomes but also allows systematic refinement of instructional practices through cycles of reflection and improvement (Alajaji et al., 2021; Tomczyk et al., 2022).

To address this gap, the present study employed a Classroom Action Research (CAR) design based on the reflective spiral model of Kemmis and McTaggart. The study was conducted through two instructional cycles consisting of planning, acting, observing, and

reflecting. This cyclical design was considered appropriate because it enabled continuous adjustment of teaching strategies based on classroom observations, learner responses, and emerging learning needs. Three game-based strategies were integrated into the intervention: Arabic crossword puzzles for vocabulary development, Quizizz-based quizzes for formative evaluation and reinforcement, and word-guessing games for speaking practice. Across the two cycles, these strategies were systematically implemented to promote greater learner participation, reduce speaking anxiety, and improve classroom interaction.

The study focused on male undergraduate students enrolled in a second-year Arabic language course. This group was selected because, despite several years of prior Arabic study, many students continued to demonstrate difficulties in active vocabulary use and oral fluency. Accordingly, this research aimed to examine how iterative game-based interventions could improve both vocabulary acquisition and speaking performance in a formal higher education classroom. Specifically, the objectives of this study were: (1) to examine the effect of crossword puzzle activities and Quizizz-based formative assessment on students' Arabic vocabulary acquisition; (2) to investigate the impact of word-guessing games on students' speaking fluency, vocabulary use, and pronunciation; and (3) to evaluate changes in learner participation, engagement, and perceptions across two cycles of classroom action research.

RESEARCH METHOD

Research Design

This study employed a Classroom Action Research (CAR) design based on the reflective spiral model proposed by Stephen Kemmis and Robin McTaggart at Nurhasanah et al. (2020)'s research. The model consists of four recursive stages: planning, acting, observing, and reflecting. Classroom Action Research was selected because it enables instructional strategies to be implemented, monitored, evaluated, and refined in response to classroom dynamics and learner needs. The intervention was conducted over two cycles, each lasting four weeks. This cyclical design allowed progressive modification of the game-based instructional activities based on observations, interim assessment results, and student feedback collected during implementation.

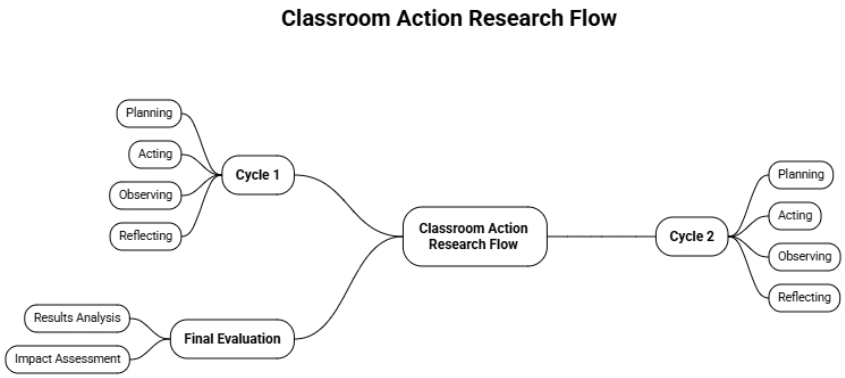


Figure 1. Classroom Action Research Flow

Participants

The participants consisted of 30 male undergraduate students aged between 18 and 22 years who were enrolled in a second-year Arabic language course in the Department of Arabic at a college in Chennai. Purposive sampling was used to select this intact class

because the students shared comparable academic backgrounds and prior exposure to Arabic language learning. All participants had studied Arabic for approximately three to five years prior to the study and had regular access to smartphones and internet connectivity. This technological access was considered essential because one component of the intervention involved digital formative assessment using the mobile application Quizizz.

Table 1. Participant Demographic Profile

Category	Details	Number (n=30)	Percentage (%)
Gender	Male	30	100
Age Range	18–22 years	30	100
Year of Study	Second Year, BA Arabic	30	100
Prior Arabic Study	3–5 years	30	100
Technology Access	Smartphone with internet	30	100

Instructional Intervention

The intervention integrated three game-based learning strategies designed to support vocabulary development, formative assessment, and oral (Lee et al., 2020; Zhang, 2022). First, Arabic crossword puzzles were used to reinforce lexical recognition, spelling, and contextual recall. The puzzles were developed based on weekly thematic vocabulary sets such as family, food, professions, and daily activities. Second, Quizizz-based formative quizzes were administered weekly to review vocabulary and grammar points introduced during classroom instruction. The quizzes provided immediate feedback and allowed students to monitor their progress in a low-stakes assessment environment. Third, word-guessing speaking games were implemented in pairs or small groups. In these activities, one student described a target word in Arabic without explicitly mentioning it, while peers attempted to guess the word. This format was intended to stimulate spontaneous oral production, descriptive ability, and interactional confidence.

Table 2. Game-Based Instructional Framework

Game-Based Strategy	Implementation	Expected Learning Outcome
Arabic Crossword Puzzles	Weekly vocabulary-based puzzle activities	Improved vocabulary retention and spelling accuracy
Quizizz-Based Quizzes	Weekly interactive vocabulary and grammar review	Immediate feedback, engagement, and revision support
Word-Guessing Games	Pair and small-group oral interaction tasks	Improved speaking fluency, confidence, and lexical retrieval

Procedure

Before the intervention, students completed a baseline vocabulary test and a speaking pre-assessment to determine initial performance levels. During Cycle 1 (Weeks 1–4), two sessions were conducted each week. The first weekly session focused on vocabulary development using crossword puzzle activities and Quizizz-based review tasks. The second session emphasized speaking practice through word-guessing games. Observation sheets were used during all sessions to record learner participation, interaction patterns, and emerging classroom issues.

Following the reflective stage of Cycle 1, instructional materials and activity procedures were revised. Greater lexical complexity, broader thematic vocabulary, and increased interactional demands were introduced. During Cycle 2 (Weeks 5–8), the revised activities were implemented using the same weekly instructional structure. At the end of

the intervention, post-tests, post-speaking assessments, and student perception questionnaires were administered.

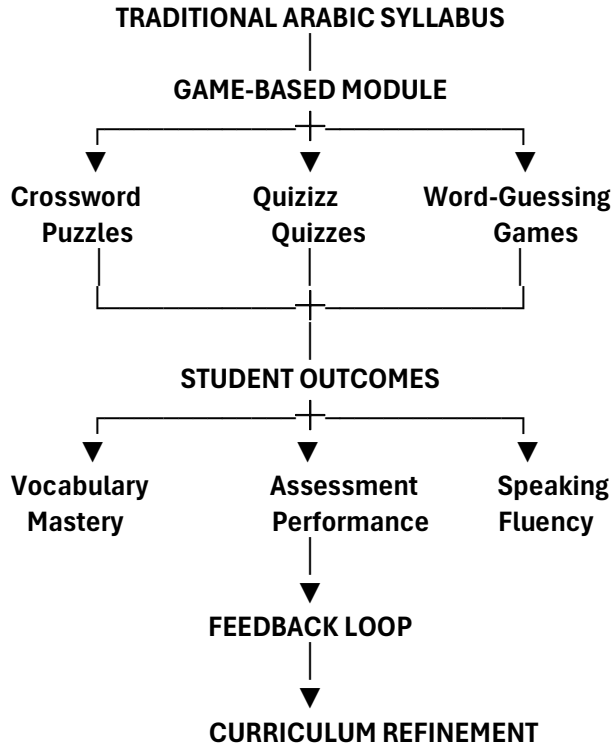


Figure 2. Integrated Game-Based Learning Model

Instruments and Data Collection

To strengthen methodological triangulation, multiple instruments were employed (Ersozlu et al., 2024).

Vocabulary Tests

Pre-test and post-test instruments were administered to measure vocabulary acquisition. The tests consisted of multiple-choice and fill-in-the-blank items aligned with lexical targets introduced during the intervention.

Speaking Assessment

Students completed structured role-play tasks before and after the intervention. Performance was rated using a ten-point analytic rubric covering fluency, vocabulary use, and pronunciation.

Quizizz Performance Records

The Quizizz platform was used to administer weekly quizzes. The system automatically generated records of student scores and completion rates.

Observation Sheets

Observation sheets were used during each session to document both quantitative indicators (e.g., percentage of active participation) and qualitative field notes concerning classroom engagement and interactional behavior.

Student Questionnaire

At the end of the study, students completed a five-point Likert-scale questionnaire examining perceived motivation, enjoyment, speaking confidence, and perceived usefulness of the game-based activities.

Data Analysis

The study employed a mixed-methods analytic approach (Y. S. Lee, 2024). Quantitative data derived from vocabulary tests, speaking assessments, and weekly Quizizz records were analyzed using descriptive statistics (means and standard deviations). To determine whether differences between pre-test and post-test scores were statistically significant, paired-sample t-tests were conducted using IBM SPSS Statistics version 26. Qualitative data obtained from classroom observations and open-ended questionnaire responses were analyzed through thematic analysis, involving coding, categorization, and interpretation of recurring patterns related to learner engagement, participation, confidence, and perceived learning benefits.

Research Trustworthiness

To enhance the credibility of the findings, the study employed methodological triangulation by combining achievement tests, speaking assessments, platform-generated learning records, classroom observations, and student self-report data (Abnar et al., 2020). In addition, the cyclical nature of Classroom Action Research enabled continuous reflection and instructional refinement, thereby strengthening contextual validity and pedagogical relevance.

Figures for Documentation

The following visual materials were retained as part of the original research documentation and should be presented in the results or appendix section (Musyafaah et al., 2021).

Diagram 1: Student Engagement Growth

Week	: 1	2	3	4	5	6	7	8
Engagement (%):	40 →	45 →	55 →	60 →	64 →	68 →	72 →	75

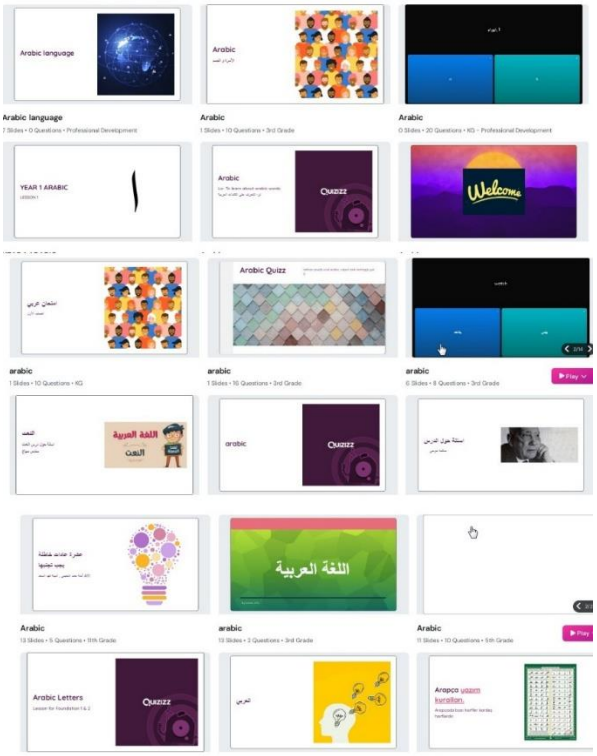
Diagram 2: Three-Strategy Impact Comparison

Horizontal Bar Chart Data:

Strategy	Impact Score (1-10)
Crossword Puzzles	8.7
Quizizz Application	9.2
Word-Guessing Games	7.8

Diagram 3: Quizizz-Based Quizzes-1

Diagram 4: Quizizz Based Quizzes-2



FINDINGS AND DISCUSSION

Results

The findings are presented in two complementary strands: quantitative outcomes, which evaluate changes in vocabulary acquisition and speaking performance, and qualitative findings, which explain how classroom interaction and learner perceptions shaped those improvements. Because this study adopted a Classroom Action Research design, the results are interpreted not merely as outcome indicators but also as evidence of pedagogical refinement across two iterative instructional cycles.

Participant Profile

The demographic profile of the participants provides contextual information for

interpreting the intervention outcomes. All participants were male second-year undergraduate students aged 18–22 years with prior exposure to Arabic for three to five years. The relative homogeneity of the sample reduced background variability and allowed closer examination of instructional effects across the two cycles.

Table 3. Participant Demographic Profile

Category	Details	Number (n=30)	Percentage (%)
Gender	Male	30	100
Age Range	18–22 years	30	100
Year of Study	Second Year, BA Arabic	30	100
Prior Arabic Study	3–5 years	30	100
Technology Access	Smartphone with internet	30	100

Quantitative Findings

Vocabulary Development

The vocabulary test results indicate a substantial improvement between pre-intervention and post-intervention performance. The comparison of scores shows that students achieved better results after the instructional treatment than before it. This improvement suggests that the learning activities contributed positively to the development of students' vocabulary mastery. The increase in post-intervention scores also reflects that students became more familiar with target vocabulary items and were able to demonstrate better understanding and use of the vocabulary during the assessment process.

Table 4. Pre-Test and Post-Test Vocabulary Scores (n = 30)

Assessment	Mean Score (/100)	Standard Deviation	Mean Difference	t-value	p-value
Pre-Test	52.4	8.7	26.2	9.87	< 0.001
Post-Test	78.6	6.3			

The mean vocabulary score increased from 52.4 to 78.6, producing a gain of 26.2 points. The paired-sample t-test revealed that this difference was statistically significant ($t = 9.87$, $p < 0.001$). Beyond statistical significance, the reduction in standard deviation from 8.7 to 6.3 suggests that the intervention not only improved average performance but also reduced variability across learners, indicating greater consistency in vocabulary mastery.

From an instructional perspective, this finding suggests that the combination of crossword puzzles and repeated formative retrieval through Quizizz facilitated sustained lexical reinforcement. The improvement appears to be linked to repeated exposure, contextual retrieval, and immediate corrective feedback. These mechanisms are consistent with previous studies showing that active recall and problem-solving tasks strengthen lexical retention more effectively than passive memorization.

Table 5. Paired-Sample t-Test Results (Vocabulary)

Test Pair	Mean Difference	t-value	df	p-value
Pre-test vs. Post-test	26.2	9.87	29	< 0.001

The strong t-value indicates that the observed gain is unlikely to be attributable to random variation or chance. This suggests that the improvement in students' performance is statistically meaningful rather than incidental. In the context of classroom-based

intervention research, such a result provides empirical support for the pedagogical effectiveness of the instructional approach used. Specifically, the findings suggest that iterative game-based vocabulary instruction contributed positively to students' learning outcomes. Therefore, the intervention can be considered an effective strategy for enhancing vocabulary acquisition in the learning environment examined in this study.

Speaking Performance

Although vocabulary gains were more pronounced, the speaking assessment also demonstrated meaningful improvement in students' performance. The results show that students were able to express ideas more clearly and use vocabulary more appropriately after the instructional treatment. This indicates that the learning activities not only enhanced vocabulary knowledge but also contributed to the development of speaking skills. The improvement in speaking performance suggests that students became more confident in using the target language during oral communication tasks. Overall, the findings reflect positive progress in both vocabulary mastery and speaking ability, with vocabulary showing the strongest development.

Table 6. Speaking Assessment Scores (Pre vs. Post)

Criteria	Pre-Test (Avg/10)	Post-Test (Avg/10)	Improvement
Fluency	4.8	7.9	+3.1
Vocabulary Use	5.1	7.7	+2.6
Pronunciation	5.0	7.5	+2.5
Overall Score	5.2	7.8	+2.6

The largest increase was observed in fluency (+3.1), followed by vocabulary use (+2.6) and pronunciation (+2.5). The greater improvement in fluency may indicate that word-guessing activities primarily enhanced spontaneous oral production rather than formal linguistic accuracy. In communicative language learning, this distinction is important because increased willingness to speak often precedes more refined pronunciation and grammatical control.

The results also suggest that speaking gains emerged through increased interactional opportunities rather than isolated language drilling. The repeated use of collaborative oral tasks created conditions in which students had to retrieve vocabulary rapidly, negotiate meaning, and respond under mild communicative pressure. Such processes likely contributed to improved speaking confidence and greater oral participation.

Weekly Formative Assessment Trends

Weekly performance data from Quizizz further illustrate the gradual consolidation of learning across the two cycles. The trend of scores shows a steady improvement from week to week, indicating that students were continuously building and reinforcing their understanding of the material. This pattern suggests that repeated exposure to learning activities and regular formative assessments helped strengthen students' retention of vocabulary. In addition, the weekly quizzes provided ongoing feedback that allowed both students and the teacher to monitor progress and address learning difficulties early. Overall, the data demonstrate that learning outcomes improved progressively throughout the instructional cycles.

Table 7. Weekly Quizizz Performance Trend

Week	Average Score (%)	Completion Rate (%)
1	68	93
2	72	97
3	75	100
4	81	100
5	84	100
6	86	100
7	88	100
8	89	100

The progressive rise in weekly scores from 68% in Week 1 to 89% in Week 8 indicates cumulative learning rather than isolated short-term gains. Particularly noteworthy is the rapid achievement of 100% completion rates from Week 3 onward. This pattern suggests not only improved academic performance but also increasing behavioral engagement and task commitment. From a pedagogical perspective, the weekly formative assessment served both evaluative and motivational functions. Immediate feedback, low-stakes repetition, and gamified participation likely contributed to sustained involvement throughout the intervention period.

Qualitative Findings and Student Perceptions

Quantitative improvements were reinforced by qualitative evidence obtained from classroom observations and end-of-study questionnaires. The observational data indicated that students showed higher levels of engagement, participation, and enthusiasm during the learning activities, particularly when game-based elements were used. In addition, questionnaire responses revealed generally positive perceptions of the instructional approach, with many students reporting that the learning process was more enjoyable and easier to understand. These qualitative findings complement the quantitative results by providing contextual insights into how and why the improvement occurred. Overall, the combination of both data sources strengthens the interpretation that the intervention had a positive impact on student learning outcomes.

Table 8. Student Feedback Survey Results (n = 30)

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Games made learning Arabic more enjoyable	20 (67%)	8 (27%)	2 (7%)	0	0
I felt less anxious speaking Arabic during games	18 (60%)	9 (30%)	3 (10%)	0	0
Crossword puzzles helped me remember words better	22 (73%)	6 (20%)	2 (7%)	0	0
Quizizz quizzes were helpful for revision	24 (80%)	5 (17%)	1 (3%)	0	0
I would like more game-based lessons in future	25 (83%)	4 (13%)	1 (3%)	0	0

Thematic analysis revealed three dominant themes: increased motivation, reduced speaking anxiety, and peer collaboration. First, 93% of students agreed or strongly agreed that game-based activities made Arabic learning more enjoyable. This finding indicates that motivational engagement was not merely incidental but constituted an important mechanism supporting sustained participation.

Second, 90% reported feeling less anxious during speaking activities. Observation

notes showed that students appeared more willing to attempt lexical production, self-correct, and continue speaking even after making mistakes. This suggests that the game-based environment lowered affective barriers and promoted communicative risk-taking. Third, classroom observations consistently documented peer-to-peer scaffolding. During crossword tasks and small-group speaking activities, students frequently explained vocabulary meanings, offered prompts, and negotiated answers collaboratively. Such collaborative interaction appears to have functioned as a mediating factor between task design and learning outcomes.

Comparative Contribution of the Three Strategies

The comparative contribution of the three strategies was analyzed to determine their relative effectiveness in supporting students' learning outcomes. Each strategy demonstrated a positive role in improving students' vocabulary mastery, although the degree of contribution varied. The findings suggest that certain strategies were more effective in enhancing engagement and retention, while others provided additional support in reinforcing understanding. By comparing the results across the three strategies, it is evident that the differences in their impact are meaningful in explaining variations in student performance. Overall, this comparative analysis highlights that the combined use of instructional strategies can contribute to more optimal learning outcomes.

Table 9. Comparative Effect of Each Game-Based Strategy

Game Strategy	Primary Skill Targeted	Average Score Improvement	Student Preference (%)
Crossword Puzzles	Vocabulary Retention	+26.2 points	87
Quizizz Application	Assessment and Recall	+21.0 points	92
Word-Guessing Game	Speaking Fluency	+2.6 points	78

The comparative pattern suggests that each strategy contributed differently to learning outcomes. Crossword puzzles produced the strongest direct effect on vocabulary retention, likely because they required repeated lexical retrieval and contextual matching. Quizizz received the highest preference ratings, indicating that students valued its immediate feedback and interactive assessment format. Word-guessing games produced smaller numerical gains, yet they appeared particularly influential in developing communicative confidence and oral spontaneity. These differentiated effects indicate that the pedagogical value of game-based learning lies not in a single technique but in the complementary integration of multiple activity types targeting distinct dimensions of language development.

Discussion

The findings of this study indicate that the integration of game-based learning strategies within a Classroom Action Research framework produced substantial improvements in both vocabulary acquisition and speaking performance. The quantitative results show a significant increase in vocabulary scores from a mean of 52.4 (pre-test) to 78.6 (post-test), with a gain of 26.2 points ($t = 9.87$, $p < 0.001$), while speaking performance improved from an overall mean of 5.2 to 7.8. These results are consistent with previous studies such as Azani et al. (2020) and Elnily et al. (2022), which reported that crossword-based learning significantly enhances vocabulary mastery through active recall. However, the magnitude of improvement in this study is relatively higher, suggesting that the integration of multiple game formats (crossword, Quizizz, and word-guessing games) may

produce stronger cumulative effects than single-strategy interventions commonly reported in earlier research.

When compared with Ariyarit et al. (2023) and Pham (2022), who emphasized the effectiveness of Quizizz as a formative assessment tool, the present findings further extend this conclusion by demonstrating not only improved engagement but also measurable cognitive gains in vocabulary retention, with weekly Quizizz scores increasing steadily from 68% to 89% across eight weeks. Similarly, Dhika et al. (2023) and Tallas et al. (2024) found that word-guessing games reduce speaking anxiety in secondary school learners; this study confirms and extends those findings in a higher education context, where 90% of students reported reduced speaking anxiety and speaking participation increased from 40% in Cycle 1 to 75% in Cycle 2. The difference in setting is important, as it suggests that game-based affective support is not limited to adolescent learners but remains effective among adult university students in more formal academic environments.

From a theoretical perspective, these findings contribute to constructivist and sociocultural views of language learning, particularly the idea that knowledge is actively constructed through interaction, scaffolding, and meaningful use of language. The significant improvement in vocabulary and speaking outcomes supports the notion that repeated retrieval (as observed in crossword and Quizizz activities) strengthens lexical consolidation, while socially interactive tasks (such as word-guessing games) facilitate communicative competence (Altakhaineh et al., 2025; Lai, 2024). The observed reduction in performance variability evidenced by the decrease in vocabulary standard deviation from 8.7 to 6.3 further suggests that game-based learning may also contribute to more equitable learning outcomes among students with different initial proficiency levels.

Practically, the study demonstrates that integrating structured game-based strategies into regular Arabic instruction can transform classroom dynamics from passive reception to active participation. The progressive increase in engagement levels from 40% in Week 1 to 75% in Week 8 indicates that sustained implementation within a cyclical CAR framework enhances learner involvement over time (Brown et al., 2021; Chow et al., 2023). The findings imply that teachers can effectively use low-cost and accessible tools such as crossword puzzles and mobile-based platforms like Quizizz to create interactive and feedback-rich learning environments. Moreover, the strong student preference ratings 92% favoring Quizizz and 87% favoring crossword activities suggest that acceptability and usability are critical factors in the successful implementation of such strategies in higher education contexts.

In terms of contribution, this study offers both methodological and pedagogical advancements. Methodologically, it demonstrates the value of Classroom Action Research as a reflective model for optimizing game-based instruction through iterative cycles, rather than treating intervention as a one-time treatment. Pedagogically, it provides empirical evidence that combining multiple game-based strategies yields synergistic effects on both linguistic competence and learner affect. Unlike previous studies that typically examine single interventions in isolation, this research shows that integrated game-based learning can simultaneously address vocabulary acquisition, speaking fluency, learner motivation, and anxiety reduction within a unified instructional design.

Overall, the study confirms that game-based learning is not merely a motivational supplement but a structured pedagogical approach capable of producing measurable linguistic and affective gains. The convergence of statistical improvement ($p < 0.001$ in vocabulary gains), behavioral engagement (increase to 75% participation), and positive learner perceptions (93% enjoyment rate) demonstrates that its effectiveness is

multidimensional. These findings reinforce the need for further research on scalable models of game-based Arabic instruction in higher education, particularly in non-Arabic speaking contexts where opportunities for authentic language use remain limited.

CONCLUSION

This study demonstrates that the integration of game-based learning strategies namely crossword puzzles, Quizizz-based formative assessment, and word-guessing games significantly enhances Arabic vocabulary acquisition and speaking skills among male undergraduate students. The most important finding is that students showed a substantial improvement in vocabulary performance, increasing from a mean score of 52.4 to 78.6 ($\Delta = 26.2$; $p < 0.001$), alongside notable gains in speaking ability from 5.2 to 7.8. The key pedagogical insight is that learning becomes more effective when lexical retrieval, interaction, and repetition are embedded in enjoyable and low-anxiety activities. The study contributes theoretically by strengthening evidence for constructivist and sociocultural perspectives in Arabic language learning, showing that structured game-based instruction can integrate cognitive, affective, and social dimensions of learning. However, the study is limited by its small sample size, single-institution context, and focus on male learners only, which restricts generalisability. Future research should involve mixed-gender participants, multi-site studies, and long-term experimental designs to validate sustainability and scalability of game-based Arabic instruction in diverse higher education contexts.

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