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Improving Arabic Literacy with ChatGPT and Gamification: A Case Study at Alif Laam Miim Islamic School

[1]Ahmad Shofiyyul Mubarok Asikin*, [2]Umi Hanifah, [3]Abdullah Baihaqi, [4]Riza Rifia, [5]Qurrota A'yun

[1]baroktowil0@gmail.com, [2]umihanifah@uinsa.ac.id, [3]abdullohbaihaki@gmail.com, [4]rizarifia17@gmail.com, [5]qurrotaayunaja4@gmail.com
[1-4]Universitas Islam Negeri Sunan Ampel Surabaya, Indonesia, [5]Universitas Islam Negeri Maulana Malik Ibrahim Malang, Indonesia

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*Corresponding Author

ABSTRACT

In the digital era, Arabic language education faces challenges in remaining relevant and engaging for digital-native learners. One promising solution is the integration of technologies such as ChatGPT and gamification into the learning process. This study investigates the effectiveness of these tools in improving Qira'ah (reading) and Kitabah (writing) skills among eighth-grade students at Islamic Secondary School Alif Laam Miim Surabaya. A mixed-methods approach was employed, combining quantitative and qualitative techniques. The study involved 30 students selected from a population of 60. Data collection methods included classroom observation, teacher and student interviews, and performance-based tests in reading and writing. Students completed tasks involving writing and reading simple sentences on the theme of "sports," focusing on correct structure, pronunciation, and intonation. Data were analyzed using descriptive and inferential statistics, including paired sample t-tests. The results revealed a significant improvement in student performance, reading scores increased from 55.5 to 84.1 and writing from 53.5 to 83.4 ($p < 0.001$). ChatGPT contributed to improved grammatical accuracy and vocabulary development, while gamified platforms like Quizizz and Kahoot! enhanced student motivation and engagement. This study concludes that the integration of ChatGPT and gamification offers a practical, modern approach to Arabic instruction. It aligns with learners' digital tendencies and encourages active, autonomous language use, suggesting a valuable model for 21st-century school education.

1. Introduction

In today's digital era, Arabic language education in Indonesian Islamic schools faces significant challenges in adapting to the learning needs of 21st-century students. Conventional

teaching approaches that rely heavily on memorization and one-way lectures often lead to low student engagement and hinder the development of essential Arabic literacy skills, particularly in reading and writing (Azizah et al., 2024).

Arabic literacy, in the context of this study, refers to two productive language skills, *Qira'ah jaliyyah* (oral reading) and *Kitabah* (writing). Oral reading is defined as the ability to read Arabic texts aloud clearly and fluently, with accurate pronunciation, proper tajwid, *makharij al-ḥuruf* (correct articulation), and adherence to punctuation and pauses. Writing refers to the ability to construct grammatically accurate and well-structured Arabic texts, conforming to the rules of *nahwu* (Arabic syntax), *sharaf* (morphology), and *imla'* (spelling). These skills are fundamental for students to comprehend and express Islamic knowledge through the Arabic language, both orally and in writing (Taufik, 2020).

Recent technological advancements have introduced innovative tools for enhancing Arabic language instruction. One such tool is ChatGPT, a text-based artificial intelligence (AI) language model capable of providing real-time grammatical feedback, generating contextual responses, and assisting with reading and writing tasks. Previous studies have found that ChatGPT can support learners in improving their Arabic writing skills and understanding of sentence structure, making it a useful writing and reading assistant (Nasaruddin, 2024; Tamam et al., 2024).

In parallel, gamification integrating game-like elements into non-game educational contexts has proven effective in boosting student motivation and engagement in Arabic language learning. Platforms such as Quizizz and Kahoot! create enjoyable and competitive learning environments that reinforce vocabulary, sentence structure, and comprehension skills. Leunard (2023) reported that gamification significantly improved student enthusiasm and participation in Arabic classes (Leunard et al., 2023).

However, most existing studies have examined ChatGPT and gamification separately and focus more on receptive skills such as listening and speaking. There is still a lack of empirical research that combines both ChatGPT and gamification in a single instructional model targeting productive Arabic literacy, especially in the areas of reading and writing, within the school context (Robbani et al., 2023).

This study aims to fill that gap by developing a hybrid instructional model integrating ChatGPT as an AI assistant and gamification as a motivational strategy to improve Arabic literacy. The focus is on students in Grade VIII at Islamic Secondary School Alif Laam Miim Surabaya. The central research problem addressed in this study is, how can integrating ChatGPT and gamification enhance Arabic literacy among school students?

To answer this problem, the study explores the following research questions, 1) How effective is ChatGPT in supporting students' understanding of Arabic texts and improving their writing

skills? 2) How does gamification influence students' motivation and outcomes in Arabic literacy? 3) What are students' perceptions of using ChatGPT and gamification in learning reading and writing?

This study proposes an integrated instructional approach that combines AI-powered writing and reading support with gamified activities. The novelty of this research lies in its simultaneous application of ChatGPT and gamification to improve productive Arabic literacy, an approach rarely explored in the context of Islamic secondary education in Indonesia. If proven effective, the model can be an innovative instructional alternative that enhances student engagement and performance while aligning with Islamic educational values. It offers a practical solution for schools seeking to modernize Arabic language instruction in an interactive, motivational, and pedagogically sound way.

2. Method

This study adopts a mixed methods approach, combining quantitative and qualitative research methods to evaluate the effectiveness of integrating ChatGPT and gamification in enhancing students' reading and writing skills in Arabic language learning. The mixed methods design was chosen to provide a comprehensive understanding of both the measurable learning outcomes and the subjective experiences of students and teachers during the learning process. The research was conducted at Islamic Secondary School Alif Laam Miim Surabaya, involving 30 eighth-grade students selected from a total population of 60 students using purposive sampling.

The participants in this study were selected using purposive sampling, based on three specific criteria to ensure suitability with the research objectives. First, students were required to have basic digital literacy, including the ability to operate a browser or mobile device, as the intervention involved digital platforms like ChatGPT and gamified tools. Second, participants needed to demonstrate minimum foundational knowledge in Arabic, particularly basic vocabulary and sentence structure, assessed through a diagnostic pre-test and teacher recommendation. Third, only students whose teachers were willing and prepared to facilitate AI-integrated instruction were included, to ensure smooth implementation of the intervention. These criteria ensured that the selected participants could meaningfully engage with both the technological tools and the Arabic literacy tasks involved in the study.

To assess student progress, quantitative data were collected through reading and writing ability tests administered before and after the intervention. The test required students to write simple Arabic sentences based on the sports theme and read them aloud with correct structure, pronunciation, and intonation. Scores were assigned using a rubric validated by three Arabic language education experts. In parallel, qualitative data were gathered through in-depth interviews with teachers and students and classroom observations recorded through field notes

and video documentation. These qualitative methods aimed to capture classroom dynamics, student engagement, and interaction with the technology.

To assess students' performance in Arabic literacy, the researcher developed two analytical rubrics, one for reading and one for writing. These rubrics were designed to evaluate the specific competencies targeted by the intervention and were adapted from relevant pedagogical frameworks in Arabic language instruction.

The rubric for reading assesses four key aspects, 1) Pronunciation the accuracy and clarity of letter articulation, 2) Application of tajwid rules, the correct use of recitation principles such as idgham and waqf, 3) Pausing and waqf, whether students pause appropriately in accordance with punctuation and meaning, 4) Intonation and fluency, the naturalness, rhythm, and expressiveness of reading aloud.

Each criterion is scored on a 4-point scale, 1 (Poor) to 4 (Excellent), with descriptors specifying the level of performance. The writing rubric consists of four parallel components, 1) Grammar (Arabic Syntax and Morphology), accuracy in sentence structure and morphological use, 2) Spelling and legibility, correctness of orthography and neatness of handwriting, 3) Vocabulary and sentence clarity, appropriate word choice and sentence construction, 4) Content relevance and coherence, logical flow and relevance to the assigned topic. This rubric also uses a 4-level scale to ensure objective, consistent evaluation of writing quality.

The instructional materials employed in the study consisted of two primary components: ChatGPT and gamified learning modules. ChatGPT was an interactive writing assistant that helped students generate and revise Arabic sentences. At the same time, gamification was implemented using platforms such as Quizizz, Kahoot!, and Wordwall, which featured game-based activities aligned with the "sports" theme. Subject matter experts reviewed and validated all materials to ensure alignment with students' skill levels and curricular objectives.

The research protocol comprised four main stages, 1) instrument development and validation, 2) administration of a pre-test to assess baseline competence, 3) implementation of the learning intervention over two weeks using ChatGPT and gamified content, and 4) administration of a post-test followed by interviews and data analysis. Throughout the intervention, the classroom teacher acted as a facilitator to ensure the proper and ethical use of technology and to encourage active participation.

Quantitative data were analyzed using SPSS, applying descriptive statistics (mean, standard deviation) and the paired sample t-test to identify significant differences between pre-test and post-test scores. Qualitative data were analyzed through thematic analysis, which involved coding and categorizing data to identify emerging themes such as motivation, engagement, and perceptions of technology use in Arabic learning.

3. Results and Discussion

3.1. General Description of Data

A purposive sample of 30 students was drawn from a population of 60 eighth graders at Islamic Secondary School Alif Laam Miim Surabaya, based on specific inclusion criteria. Selection criteria included students' access to technology, their prior exposure to basic Arabic materials, and the readiness of the Arabic teacher to implement technology-integrated instruction. Specifically, the basic Arabic knowledge referred to students' familiarity with the Arabic alphabet, essential vocabulary related to daily themes such as family, school, and sports, and the ability to construct simple nominal and verbal sentences. In addition, students were introduced to elementary grammar, including pronouns, present tense verbs, and plural forms.

Based on initial documentation and a preliminary survey, most students were between 13 and 14, with a relatively balanced distribution. Most came from middle-income Muslim families and demonstrated moderate digital literacy. This is consistent with the findings of Dahlan et al. (2024), who noted that Islamic Secondary School students are increasingly adaptive to digital learning environments, particularly when supported by mobile or web-based platforms (Dahlan et al., 2024).

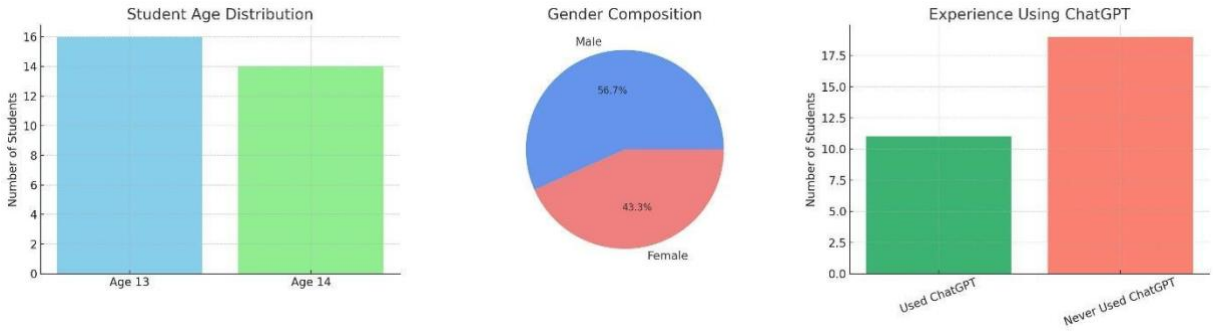

Figure 1. Distribution of Student Age, Gender Composition of Participants, and Student Experience Using ChatGPT

Figure 1 shows that of the 30 students, 17 were male and 13 were female. Preliminary surveys revealed that 63% of the students had never used AI tools such as ChatGPT, while 80% expressed interest in learning through interactive games and digital quizzes. These findings reinforce the conclusions of Fahiroh et al. (2021), who found that Islamic Secondary School students respond more positively to engaging, interactive learning methods, especially when studying foreign languages like Arabic (Fahiroh et al., 2021).

Regarding their baseline Arabic skills, the average pre-test score for writing was 5.3, while reading averaged 5.8. These scores suggest that most students began with below-average proficiency. This is aligned with the results of Sabarudin et al. (2023), who highlighted that the key challenges in Arabic language learning at the junior secondary level lie in productive language

skills, often due to repetitive and teacher-centered methods.

Initial classroom observations further revealed high levels of student interest in technology-based learning. Integrating tools such as Quizizz and ChatGPT generated noticeably greater engagement, echoing findings from Kosim et al. (2025), who reported increased motivation among students when contextual and digital resources were embedded in Arabic instruction (Kosim et al., 2025).

In conclusion, this descriptive profile provides critical context for interpreting student performance changes following the intervention. The demographic data and learners' initial conditions offer a realistic foundation for assessing the effects of AI and gamification on enhancing Arabic literacy skills.

3.2. Reading and Writing Test Results

This study evaluated the effectiveness of integrating ChatGPT and gamification in improving two key productive skills in Arabic language learning, reading and writing. Pre-test and post-test scores from 30 eighth-grade students at Islamic Secondary School Alif Laam Miim Surabaya revealed significant improvements. For reading, the average score increased from 55.5 to 84.1, while for writing, it rose from 53.5 to 83.4. An increase of nearly 30 points in both skills indicates a substantial positive impact of this technology-assisted learning intervention on students' Arabic literacy.

Table 1. Average Pre-Test and Post-Test Scores

Ability	Pre-Test	Post-Test
Reading	55,5	84,1
Writing	53,5	83,4

Table 1 illustrates a comparison of average pre-test and post-test scores for two core skills in Arabic language learning, reading and writing, following the implementation of a ChatGPT and gamification-based instructional model.

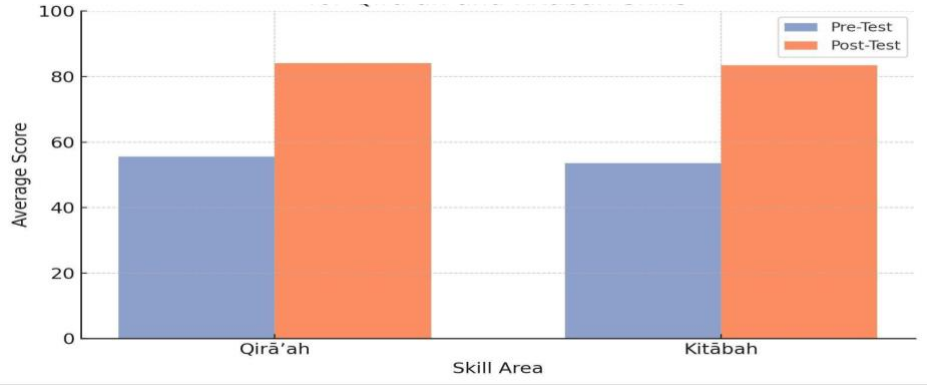

Figure 2. Comparison of Pre-Test and Post-Test Scores for Reading and Writing Skills

Figure 2 shows that in the reading skill, the average score increased from 55.5 in the pre-test to 84.1 in the post-test. This significant improvement indicates that students made substantial

progress in comprehending and reading Arabic texts after participating in technology-assisted learning. The interactivity provided by ChatGPT, combined with game-based quiz platforms like Kahoot! and Quizizz, has enhanced reading interest and comprehension.

For the writing skill, the average score rose from 53.5 to 83.4. This suggests that students gained confidence in writing in Arabic and improved sentence structure, vocabulary, and grammar usage. The automatic correction features and contextual feedback offered by ChatGPT greatly supported students in revising their writing independently.

Overall, the chart reflects the success of a technology-integrated learning strategy in significantly enhancing students' productive competencies. The consistent score increases across both skill areas demonstrate the effectiveness of combining technology with pedagogy in Arabic language instruction at the school level.

Students' direct interactions with ChatGPT supported selection The significant improvement in reading scores during the learning process. ChatGPT provided sentence models and instant corrections that helped students understand proper structures and improve pronunciation, enhancing their fluency and confidence in reading. This shows that the statistical gains were closely linked to students' deeper comprehension facilitated by ChatGPT. This finding aligns with the work of Habib (2025), who reported that interactive digital tools such as gamification and AI-based assistants increase reading interest and comprehension among school students through contextual and engaging activities (Habib, 2025).

However, this result differs from the findings of Maghfurin et al. (2025), who employed mobile applications like Duolingo and Memrise for Arabic language learning. Their study observed improvements primarily in phonological and morphological competencies, but not in productive skills such as reading comprehension. One possible factor contributing to this difference is the interactive nature of ChatGPT, which allows students to pose questions and receive contextual responses, as opposed to the more rigid, repetitive structure of mobile applications (Maghfurin et al., 2025).

Similarly, the increased writing scores were numerical and reflected students' improved ability to construct grammatically accurate sentences with ChatGPT's support. The tool offered real-time feedback and vocabulary suggestions, enabling students to revise their sentences independently, for example, correcting *huwa talʿabu kurratul qadami* into *huwa yalʿabu kurratul qadami*. These interactions demonstrate that ChatGPT directly supported students' understanding of Arabic grammar and writing skills. The technology provided a non-judgmental and exploratory space, allowing students to use trial and error without fear.

These findings are consistent with those of Khusni et al. (2024), who found that AI-powered chatbots enhanced students' vocabulary and grammatical accuracy in Arabic writing by simulating

interactive dialogue (Khusni et al., 2024).

Nonetheless, technology-based approaches do not always yield better outcomes compared to conventional methods. For example, Sabarudin et al. (2023) demonstrated that the SAVI model (Somatic, Auditory, Visual, Intellectual), which emphasizes multi-sensory learning experiences, significantly improved students' Arabic writing skills. This model proved more effective in some learning contexts than digital platforms, particularly due to its hands-on and immersive characteristics (Sabarudin et al., 2023).

These contrasting findings suggest that the effectiveness of instructional strategies is influenced by several contextual factors, including student characteristics, levels of digital literacy, instructional design, and the teacher's role in facilitating technology use. In this study, the success of ChatGPT and gamification was not solely due to the technology itself but also to a carefully planned instructional approach. Contributing factors included familiar and engaging topics, active teacher facilitation, and a blend of instant feedback with competitive, game-based learning activities.

Overall, the results of this study contribute valuable insights into the development of Arabic language teaching models that are adaptive to technological advancements. While prior studies often positioned technology as a supplementary tool, this research presents it as the central component of a structured and interactive learning process. When implemented with appropriate pedagogical strategies, tools such as ChatGPT and gamification can serve as enhancements and as the foundation of effective Arabic instruction in the digital age.

3.3. Statistical Analysis

To evaluate the effectiveness of integrating ChatGPT and gamification in improving students' reading and writing skills, the researcher employed a paired sample t-test. This statistical test is commonly used in educational research to measure the significance of changes in learning outcomes before and after an intervention using two related datasets (Fatoni & Ainiyah, 2024).

3.3.1. Reading Ability

The results of the paired sample t-test for reading showed a mean difference of -27.40, with a standard deviation of 12.99 and a p-value (Sig. 2-tailed) of 0.000. The t-score was -11.549, with 29 degrees of freedom, and the 95% confidence interval ranged from -32.25 to -22.54.

Table 2. Statistical test results paired sample T-Test reading ability

Paired Samples Test Reading Ability									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test and Post-Test Reading	-27.40000	12.99496	2.37254	-32.25240	-22.54760	-11.549	29	.000

Table 2 shows that since the significance value is less than 0.05, it can be concluded that there is a statistically significant difference between the pre-test and post-test scores for reading ability. This indicates that the implementation of ChatGPT and gamification had a real and measurable impact on enhancing students' reading abilities. In other words, students demonstrated improved comprehension of Arabic texts, better pronunciation, and increased confidence in reading after participating in the technology-based learning intervention. This conclusion is based on the principles of statistical testing, where a p-value < 0.05 signifies that the treatment had a significant effect on learning outcomes.

The paired sample t-test showed a mean score improvement of 27.40 points, with a t-value of -11.549 and a p-value of 0.000, indicating a statistically significant difference between the pre-test and post-test scores. This suggests that students were reading more fluently and applying correct tajwīd rules and articulating sounds with greater precision. Several factors may explain this result,

- Immediate AI-generated feedback: ChatGPT likely helped students recognize misread structures and correct pronunciation by offering real-time responses or modelled examples of proper Arabic sentences.
- Increased exposure and autonomy: Students could practice reading independently without waiting for teacher correction, encouraging more frequent engagement.
- Reduced anxiety through gamification: Game elements likely lowered students' affective filter, enabling them to read aloud more confidently and motivated.

These findings are consistent with those of Tamam et al. (2024), who observed that ChatGPT's Arabic grammar processing support enhanced students' fluency and reading accuracy. In addition, Hariansah & Rasyid (2023) also demonstrated that card-sort-based learning improved reading and writing skills among junior high school students by promoting learner engagement and contextual reinforcement (Hariansah & Al Rasyid, 2023).

3.3.2. Writing Ability

For writing, the paired sample t-test showed a mean difference of -29.93, with a standard deviation of 10.68, a t-value of -15.337, and a p-value of 0.000. The 95% confidence interval ranged from -33.92 to -25.94, indicating that the post-test scores were significantly higher than the pre-

test.

Table 3. Statistical Test Results Paired Sample T-Test Writing Ability

Paired Samples Test Writing Ability									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test and Post-Test Writing	-29.93333	10.68977	1.95168	-33.92496	-25.94171	-15.337	29	.000

Table 2 shows that the significance value, well below 0.05, indicates that the difference between pre-test and post-test scores for writing is also highly significant. Therefore, it can be concluded that the integrated use of ChatGPT and gamification meaningfully enhanced students' writing abilities. Students could construct grammatically accurate Arabic sentences, enrich their vocabulary, and express their ideas more confidently in written form. Similar to the findings in reading, this conclusion was drawn based on the criteria of the paired sample t-test, where a p-value less than 0.05 indicates that the observed improvement is not due to chance but rather a direct result of the applied intervention.

For writing, the t-test showed an even larger mean improvement of 29.93 points, with a t-value of -15.337 and a p-value of 0.000. This gain indicates significant development in grammar, spelling, structure, and expressive clarity. Key factors supporting this outcome include,

- Grammar sensitive language modeling by ChatGPT, helped students observe and replicate correct structures in their writing.
- Vocabulary expansion and sentence diversity, made possible by ChatGPT's contextual suggestions.
- Gamified writing challenges that increased motivation, creativity, and output, especially in students who previously struggled with conventional writing instruction.

These results align with findings by Nasaruddin (2024), who noted that AI-based writing assistance fosters more confident composition among learners (Nasaruddin, 2024). Moreover, Fuadah (2020) demonstrated that visual and interactive tools like Instagram content enhanced student engagement and improved writing and reading outcomes (Fuadah, 2020).

However, challenges must be acknowledged. Robbani et al. (2023) warned of overreliance on AI and underutilization of its language-enhancing functions among Arabic students (Robbani et al., 2023). In contrast, this study intentionally integrated ChatGPT with guided teacher support and gamification, which may have created the optimal balance between technology and pedagogy.

The findings of this study indicate a significant improvement in students' oral reading and

writing skills following the implementation of ChatGPT and gamification-based instruction. These results do not stand in isolation but align with a growing body of research demonstrating that innovative technology-driven approaches can effectively enhance students' Arabic literacy competencies.

In a study by Hariansah & Rasyid (2023), the Card Sort method was shown to significantly improve students' writing and reading skills through an active learning approach involving the contextual categorization and organization of information (Hariansah & Al Rasyid, 2023). This aligns with the present study's findings, where the gamification component encouraged active engagement and enhanced retention of language structures practiced through ChatGPT.

Meanwhile, Fuadah (2020) demonstrated that the use of social media, specifically the Instagram account @Nahwu_Pedia can support students' development in both reading and writing by presenting materials in a structured and visually engaging manner (Fuadah, 2020). This supports the notion that visualization, interactivity, and flexible access to digital content play a significant role in fostering productive Arabic language skills, especially for digital-native learners.

However, highlighted that persistent challenges in writing include poor grammatical understanding, limited vocabulary, and low writing motivation. In this context, ChatGPT served as a facilitator by providing model sentences, accurate syntactic structures (Arabic syntax and morphology), and contextual vocabulary enrichment, offering a concrete solution to these common obstacles.

Additionally, Najah & Maulana (2019), in their study on the use of mind mapping strategies, found that writing proficiency could be improved through visual association, idea structuring, and creativity (Najah & Maulana, 2019). In this respect, ChatGPT provides an alternative cognitive pathway that helps students organize their thoughts and develop structured writing functionally similar to traditional mind mapping techniques.

Nevertheless, Robbani et al. (2023) caution that using ChatGPT can be less effective without proper teacher guidance (Robbani et al., 2023). In the current study, the combination of AI, structured teacher support, and gamification proved to be a stronger and more reliable instructional model than the use of AI alone.

3.3.3. Interpretation and Comparative Analysis of Findings

The statistical analysis clearly demonstrated that the integration of ChatGPT and gamification significantly enhanced students' Arabic literacy, specifically in reading and writing skills. This section interprets the results in light of existing literature and explores potential pedagogical, cognitive, and technological factors contributing to these improvements.

3.4. Findings from Class Observations

Classroom observations conducted during the implementation of ChatGPT and gamification

in reading and writing instruction revealed a significant improvement in student engagement, self-directed learning behaviour, and learning enthusiasm. The data Habib gathered using a structured observation sheet covering six key indicators: active participation, use of technology, gamification response, collaboration, focus, and linguistic behaviour development. Each indicator was assessed on a scale from 1 (very poor) to 4 (excellent).

The indicator for active participation scored 3, indicating that most students were actively involved in the learning process, especially in composing and reading Arabic sentences using ChatGPT assistance. The use of technology (ChatGPT) received the highest score of 4, showing that students quickly adapted to its features, such as grammar correction, sentence generation, and contextual Arabic support. One notable moment involved a student entering the prompt *uktub jumlatan ʿanir riyāḍah*, which means, "Write a sentence about sports" and self-correcting based on ChatGPT's feedback.

Student enthusiasm toward gamified activities also earned a score of 4, demonstrated through their engagement in interactive quizzes via platforms like Quizizz and Kahoot!. After winning a quiz round, one student exclaimed, "I want to keep learning so I can win again!" This indicates intrinsic motivation driven by game-based learning. The indicator for student collaboration also scored 4, as learners were frequently observed helping one another with technological instructions and discussing quiz answers cooperatively.

The student focus and attention indicator received a score of 3, reflecting generally consistent engagement with occasional distractions due to visual or audio elements within the gamified platforms. Meanwhile, the indicator for linguistic behavior development received a score of 4, marked by students demonstrating increased accuracy in grammar and pronunciation. For instance, one student revised their sentence from *huwa talʿabu kurratul qadami* to the correct form *huwa yalʿabu kurratul qadami* independently, indicating an improved grammatical understanding.

These findings align with Fatoni & Ainiyah (2024), who reported that gamified digital learning platforms significantly enhance students' cognitive and affective engagement in Arabic language instruction (Fatoni & Ainiyah, 2024). Nufus & Wijaya (2024) similarly found that ChatGPT-based questioning techniques improved literacy through responsive and contextual feedback (Nufus & Wijaya, 2024).

These classroom observation findings confirm that combining AI-driven tools with gamified strategies in Arabic instruction promotes active learning, peer collaboration, and measurable linguistic growth, representing a responsive and transformative shift in language pedagogy for the digital era.

3.5. Findings from Student and Teacher Interviews

In-depth interviews with the Arabic language teacher and six Grade VIII students at Islamic Secondary School Alif Laam Miim Surabaya revealed positive responses regarding integrating technology in reading and writing instruction. Overall, both students and the teacher agreed that ChatGPT and gamified platforms such as Quizizz significantly enhanced students' motivation, engagement, and literacy skills in Arabic.

3.5.1. Student Responses to Technology Integration

Participants were selected using purposive sampling, which allowed the researcher to deliberately choose individuals who met predetermined characteristics aligned with the study's aims. These included: 1) regular access to digital devices and the internet, 2) basic literacy in Arabic language structure, and 3) enrollment in a class where the Arabic teacher was prepared to integrate ChatGPT and gamification into instruction.

> *"I feel more excited because learning is no longer boring like before. With games, it feels like playing while learning,"* one student shared.

These findings align with the study which showed that Technology-Assisted Project-Based Language Learning significantly fosters a sense of achievement and intrinsic motivation among students in Arabic-speaking contexts such as Libya and Lebanon. Similarly, found that using E-learning tools supported Arab students in building confidence and autonomy, especially in remote language learning settings.

3.5.2. Student Responses to Technology Integration

The Arabic teacher highlighted that ChatGPT was highly beneficial in assisting students in improving sentence structure and receiving immediate, non-threatening feedback. The integration of gamification in the classroom also resulted in higher student participation.

> *"Gamification makes students more active and interested not just because of the rewards, but because they feel a sense of accomplishment,"* the teacher noted.

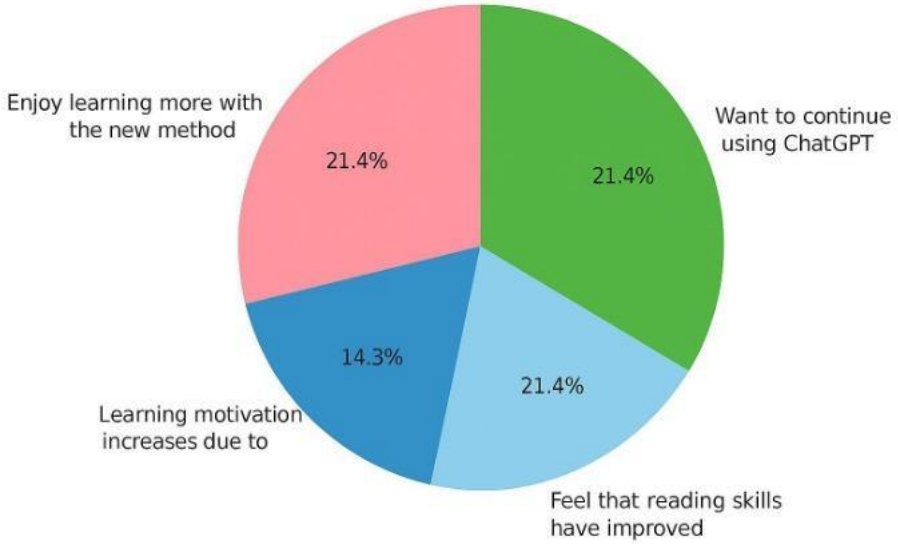

Figure 3. Percentage of Student Responses to the Use of Technology

Figure 3 shows that 21.4% of students reported that they enjoy learning more with the new method and wish to continue using ChatGPT, while 14.3% indicated that their motivation to learn has increased and their reading skills have improved. These findings suggest that the integration of ChatGPT and gamification positively impacts student motivation and Arabic literacy outcomes in this educational context. These observations are supported by Tafazoli (2025), who emphasised that teachers' technological literacy is critical in successfully implementing AI-enhanced learning. Educators who balance technological tools with humanistic approaches tend to foster more holistic and engaging learning environments (Tafazoli & Tafazoli, 2025).

Moreover, Narayana & Himni (2024), through a qualitative study in West Nusa Tenggara, demonstrated that technology-based learning in EFL classrooms improves interactivity, contextual understanding, and reading proficiency. This aligns with the teacher's account that Quizizz trained students in reading comprehension and recognizing grammatical structures through engaging, time-bound tasks (Narayana & Himni, 2024).

3.5.3. Visualization of Student Responses

Interview data from six students showed that 100% of them, 1) Felt supported in writing Arabic sentences using ChatGPT, 2) were more enthusiastic due to interactive quizzes and games, and 3) preferred this new learning approach over traditional methods. Additionally, 67% reported noticeable improvement in their reading abilities after using these tools.

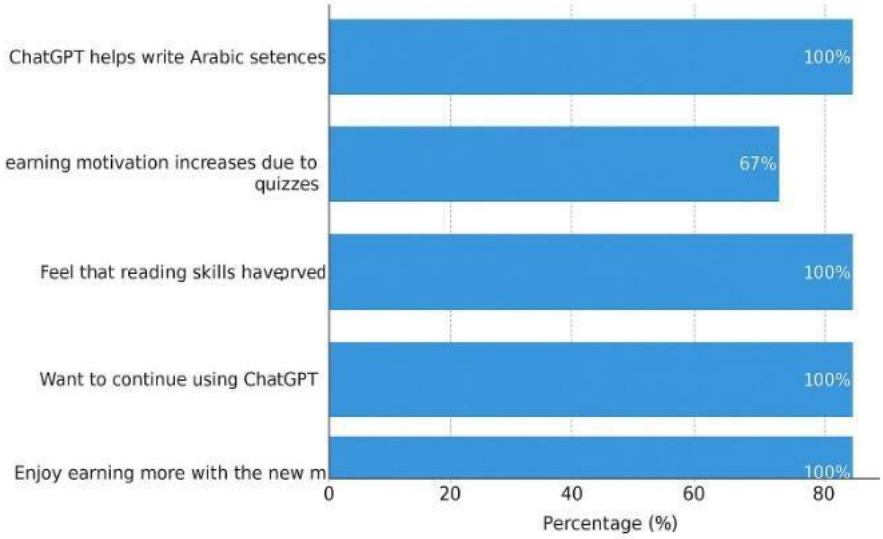

Figure 4. Comparison of Student Responses to the Use of Technology

Figure 4 shows that 100% of students expressed an increased motivation to learn due to gamified quizzes, felt that their reading skills had improved, and wished to continue using ChatGPT; additionally, 67% reported that ChatGPT helped them write Arabic sentences. These results highlight the significant positive effects of integrating ChatGPT and gamification on Arabic literacy and student engagement in the classroom. The findings reflect those of Al-Seghayer (2022), who concluded that students' positive perceptions of educational technologies are closely linked to increased self-efficacy and active participation in language learning (Al-Seghayer, 2022). Both teachers and students acknowledged the benefits of adaptive, visual, and interactive learning tools. However, the teacher also cautioned that gamified elements must be strategically designed to support, not distract from, the intended learning objectives.

3.6. Scientific Discussion

This section presents an in-depth interpretation of the research findings regarding the significant influence of ChatGPT and gamification on students' reading) and writing ability. The discussion includes theoretical perspectives, comparative insights from previous studies, and critical evaluations of both the potential and limitations of using AI-driven technology and gamification in Arabic language education.

3.6.1. The Scientific Basis of ChatGPT in Supporting Writing Skills

The significant improvement observed in students' writing scores after the intervention with ChatGPT can be scientifically explained through AI's function as a language scaffolding facilitator. ChatGPT offers real-time feedback, corrects grammatical structures, suggests vocabulary, and helps students organize sentences into coherent paragraphs. According to Pandey & Bhusal (2024), ChatGPT literacy enables learners to acquire key rhetorical competencies, including prompt literacy, sentence construction, genre recognition, and effective message delivery (Pandey

& Bhusal, 2024).

The cognitive mechanism behind this lies in how ChatGPT functions as a dynamic scaffolder, helping students transition from potential understanding to actual performance. This aligns with Vygotsky's Zone of Proximal Development (ZPD), wherein learners achieve more complex tasks by assisting a more capable "other." In this case, ChatGPT plays the role of that "other," delivering adaptive, context-sensitive support that bridges students' linguistic gaps.

Duong et al. (2024) found that postgraduate students using ChatGPT in academic writing courses significantly improved grammatical accuracy and cohesion while experiencing reduced cognitive load during writing processes (Duong et al., 2024). Similarly, Xu et al. (2024) noted that ChatGPT enhanced EFL students' writing coherence and vocabulary precision, especially in logically structuring arguments and organizing ideas (Xu et al., 2024).

However, not all findings are without caution warned of an overreliance on AI tools like ChatGPT, as students may develop passive learning habits and reduce engagement in creative thinking and independent problem-solving. Therefore, while ChatGPT presents a powerful tool for enhancing writing, its integration must be pedagogically managed to encourage active learning and critical reflection.

3.6.2. Gamification and Its Influence on Learning Motivation

The role of gamification in this study was found to be particularly influential in enhancing student motivation and engagement in Arabic language learning. This is in line with gamification theory, which posits that applying game elements such as points, rewards, competition, and visual progression in non-game contexts can increase user motivation and improve performance (Paixão & Cordeiro, 2021).

Gamified tools like Quizizz and Kahoot! were employed alongside ChatGPT to create a dynamic and interactive learning environment. According to Murgayah et al. (2025), AI-driven gamification significantly improves vocabulary retention and expressive language use by making learning more engaging and personalized. In this study, students displayed higher levels of enthusiasm and active participation, which likely contributed to the observed improvements in both reading and writing scores (Murgayah et al., 2025).

Theoretically, this can be explained using Self-Determination Theory (SDT), which asserts that intrinsic motivation increases when learners feel a sense of autonomy, competence, and relatedness (Sanchez-De Miguel et al., 2023). Gamification supports all three components by giving students control over their pace, clear feedback on performance, and opportunities for social interaction through competitive learning formats.

Nevertheless, it is crucial to note findings from Hidayatullah (2024), who cautioned that while gamification may boost engagement initially, its effects can diminish without meaningful content and reflective learning strategies (Hidayatullah, 2024). This underscores the importance of pairing gamification with structured pedagogy to sustain long-term motivation and learning gains.

3.6.3. Comparative Analysis with Previous Studies

The findings of this study are broadly consistent with prior research affirming the value of technology-enhanced language instruction. For example, Pham (2025) conducted a literature review on ChatGPT-assisted writing in EFL contexts, concluding that students benefit from real-time feedback, personalized learning, and reduced anxiety during writing tasks (Pham, 2025).

Conversely, Boudouaia et al. (2024) found that while ChatGPT significantly enhanced writing performance in controlled experimental conditions, some students demonstrated surface-level learning behaviors, such as copying AI outputs without internalizing linguistic structures (Boudouaia et al., 2024). This suggests a tension between convenience and cognitive depth, necessitating further study on promoting active engagement with AI tools.

Regarding reading, studies on digital reading comprehension platforms mirror the outcomes of this research. Çobanoğulları (2024) observed that students using ChatGPT for reading exercises demonstrated higher retention and better inference-making skills compared to those using traditional methods (Çobanoğulları, 2024). However, the same study highlighted concerns about factual accuracy and the importance of guiding students in verifying AI-generated content.

3.6.4. Synthesis and Implications

Synthesizing these findings, it becomes clear that integrating ChatGPT and gamification, when grounded in sound pedagogical frameworks, can significantly enrich language learning experiences. The improvements in reading and writing observed in this study affirm the role of AI and gamified learning in supporting language acquisition. However, the literature also indicates that to harness the full benefits of these tools, educators must foster digital literacy, maintain active facilitation, and cultivate ethical and critical thinking among students.

A blended approach that combines AI assistance with peer collaboration and teacher-guided feedback may offer a more holistic learning environment in future applications. Additionally, adaptive learning systems that track student progress and provide customized challenges could further enhance the personalization offered by ChatGPT and gamified tools. This study contributes to the growing body of research that explores AI in language education, reaffirming the importance of responsible technology use while demonstrating tangible benefits in learners' productive and receptive language skills.

4. Conclusion

This study demonstrates that integrating ChatGPT and gamification into Arabic language instruction significantly enhances students' literacy skills, particularly in reading and writing. Students benefited from improved grammatical accuracy, reading fluency, and motivation, supported by both quantitative gains and qualitative feedback.

Despite these promising outcomes, the study was limited by its small sample size, single-school context, and short implementation period. Broader studies are needed to validate these findings across diverse educational settings. Nevertheless, this research contributes a novel instructional framework that blends AI-driven feedback with gamified learning. It offers practical insights for Arabic educators seeking to modernize pedagogy through technology-enhanced, learner-centered approaches.

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