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THE USE OF GAMIFICATION IN LEARNING ARABIC VOCABULARY IN FOURTH GRADE MI IN THE DIGITAL ERA

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ABSTRACT

Learning Arabic vocabulary in Islamic elementary schools is often considered difficult and boring by students, which affects their vocabulary mastery and motivation to learn. This study aims to describe the design of gamification implementation in learning Arabic vocabulary, analyze the effectiveness of gamification use in improving vocabulary mastery, and identify students' responses to learning with a gamification approach in grade IV MI. This research uses a quantitative approach with a quasi-experimental design of the nonequivalent control group type, involving 58 grade IV students of MI Muhammadiyah 1 Yogyakarta, consisting of 29 students in the experimental group and 29 students in the control group. Data collection was carried out through vocabulary mastery tests, student response questionnaires, learning observations, and documentation. Data analysis used the Independent Sample t-Test, N-Gain calculations, and descriptive analysis. The research results show that there is a significant difference between the vocabulary mastery of students in the experimental group and the control group, with a t-value of 8.342 and a significance of 0.000 ($p<0.05$). The average posttest score of the experimental group was 86.48, higher than the control group at 71.38, with a difference of 15.10 points. The N-Gain score of the experimental group was 0.67 (medium category), higher than the control group at 0.33 (medium category), indicating that gamification provides a greater improvement effect. Student responses to gamified learning were very positive at 86.0%, particularly in the aspects of interest in gamification (89.0%) and perceived benefits (86.4%). Observation results showed that the implementation of gamification ran very well, with an average score of 3.75 out of 4, with the student enthusiasm aspect receiving the highest score (3.92). It can be concluded that the use of gamification with points, levels, badges, leaderboards, quests, and rewards through the Kahoot!, Quizizz, and Wordwall platforms effectively enhance the vocabulary mastery of fourth-grade MI students in Arabic and create an enjoyable learning experience according to the characteristics of students in the digital era.

Keywords: Gamification, Arabic vocabulary, Arabic language learning, elementary education, Digital Learning

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A. INTRODUCTION

The development of digital technology has brought fundamental changes in various aspects of human life, including in the field of education. The era of the Industrial Revolution 4.0, marked by the integration of information and communication technology, demands a transformation in learning methods that is more innovative and adaptive to the needs of alpha generation learners. (Febriana and Muflihin 2025; Nasir 2024). The generation born between 2010 and 2025 has unique characteristics as digital natives who have grown up with full access to technology devices from an early age (McCrindle and Fell 2020). They tend to be more interested in interactive, visual learning that provides instant feedback compared to conventional, teacher-centered methods. (Utami et al. 2025). This condition necessitates educators to innovate learning methods that can accommodate contemporary students' learning styles so that learning objectives can be achieved optimally (Nuryadin, Fairuz, and Sembodo 2025).

Arabic language learning as one of the compulsory subjects in Madrasah Ibtidaiyah (MI) faces its own challenges in the context of changes in the educational paradigm in the digital era. Arabic, which is essentially a foreign language for Indonesian students, is often considered a difficult and boring subject (Azizah 2025). Research conducted by Maghfirah, Taufik, and Aliwafa (2024) It shows that MI students often consider learning Arabic vocabulary boring, which can hinder the learning process and decrease students' motivation. This problem is exacerbated by the lack of interactive learning media and the conventional approaches that still dominate teaching practices in most MIs in Indonesia (Mustaufiy 2022). As a result, students' motivation to learn decreases and the expected competence in Arabic is not achieved optimally, especially in terms of mastery of vocabulary as the main foundation of language skills (Maghfirah et al. 2024).

Mastery of vocabulary is a fundamental aspect of learning Arabic because it serves as the basis for developing the four language skills: listening (istima'), speaking (kalam), reading (qira'ah), and writing (kitabah). Without adequate vocabulary mastery, students will face significant obstacles in understanding Arabic texts, communicating, and expressing ideas in Arabic (Bahri 2025). Susanto's research (2021) It reveals that fourth-grade MI students are at a critical stage in learning Arabic, where they begin to develop more complex thinking skills but still require concrete and enjoyable learning approaches. At this level, students need learning strategies that can transform the process of memorizing vocabulary from a boring activity into an engaging and meaningful learning experience. Therefore, innovative teaching methods are needed that can bridge the needs of students in the digital era with the requirements of the Arabic language curriculum at MI (Damanik and Nasution 2024).

Gamification, or the application of game elements in non-game contexts, has emerged as an innovative solution to increase student engagement and motivation in learning in the digital era. The concept of gamification involves using game mechanics such as points, levels, badges, leaderboards, quests, and rewards in learning activities to create a more engaging and challenging learning experience (Nisa, Waworuntu, and Lumba 2023). Unlike game-based learning, which uses complete games, gamification integrates game elements into the conventional learning process so that educational goals remain the primary focus. Laksana et al. research (2024) proving that learning with a gamification approach can increase students' learning motivation and long-term memory retention. In the context of foreign language learning, gamification has been proven effective in improving vocabulary acquisition because it creates enjoyable repetition and varied contexts for word usage (Fithriani 2021).

The implementation of gamification in learning Arabic vocabulary at MI is highly relevant considering the characteristics of fourth-grade students, who are aged 9-10 and are still in the concrete operational stage with a strong tendency towards play activities (A, Zulhannan, and Mizan 2025). Solikah (2025) In his research, he stated that the gamification approach can increase students' enthusiasm in learning because it integrates competitive, collaborative, and interactive aspects. Furthermore, Naqib and Ubaidillah (2025) found that gamification in learning Arabic is effective in building learning habits and making Arabic classes more lively and interactive.

Elements such as a points system for each vocabulary word successfully memorized, badges for certain achievements, and a leaderboard to foster healthy competition have proven effective in building students' intrinsic motivation to learn (Febriansah et al. 2024). Thus, gamification is not merely a strategy to make learning more engaging, but also a pedagogical approach that aligns with the cognitive and psychological development characteristics of MI students (Srimuliyani 2023).

Although research on gamification in learning has been widely conducted, specific studies on the implementation of gamification in learning Arabic vocabulary at the MI level, especially in grade IV, are still relatively limited. Previous studies have mostly focused on learning English or science subjects at higher levels. In fact, learning Arabic at MI has unique characteristics that are different from learning other foreign languages, both in terms of linguistic, cultural, and religious values inherent in it. In addition, most MI teachers still face challenges in integrating technology and gamification into learning due to limitations in digital competence and access to adequate resources. Therefore, this study aims to fill this gap by exploring how an appropriate gamification design can be applied in Arabic vocabulary learning that aligns with the sociocultural context of Indonesian MI students, teacher capabilities, and the facilities available in madrasah educational institutions.

Based on this background, this study aims to: (1) describe the design of gamification implementation in Arabic vocabulary learning in the fourth grade of MI that suits the characteristics of students in the digital era; (2) analyze the effectiveness of using gamification on improving the mastery of Arabic vocabulary among fourth-grade MI students; and (3) identify students' responses to Arabic vocabulary learning using a gamification approach. This research is expected to provide a theoretical contribution to the development of technology-based Arabic language learning studies, as well as a practical contribution for Arabic language teachers in Islamic elementary schools in designing innovative, effective, and enjoyable learning in accordance with the demands of the times.

B. METHODS

This study was designed to explore the effectiveness of using gamification in improving Arabic vocabulary mastery among fourth-grade students at Madrasah Ibtidaiyah. The approach used is a quantitative approach with a quasi-experimental research design, considering that the study was conducted in classes that were naturally formed within the school, making full subject randomization impossible. The choice of this quasi-experimental design aligns with the real conditions in the educational field, where researchers have to work with existing classes without altering the established learning organization structure.

The research design applied was a Nonequivalent Control Group Design, involving two class groups with relatively equivalent characteristics. The first group served as the experimental group that received treatment in the form of vocabulary learning with a gamification approach, while the second group functioned as the control group that continued using conventional learning methods. Both groups were given a pretest before the treatment to measure their initial abilities, and after a series of lessons over six weeks, both groups were given a posttest to measure their final achievement in vocabulary mastery. The difference in scores between the pretest and posttest in both groups was then compared to determine whether there was a significant effect of applying gamification on the mastery of Arabic vocabulary.

This research was conducted at MI Muhammadiyah 1 Yogyakarta during the even semester of the 2024/2025 academic year, specifically from February to April 2025. The selection of this research location was based on several strategic considerations, including the fact that the madrasa has adequate technological facilities to support the implementation of digital-based learning, stable internet access, and the willingness of the school to collaborate in innovative Arabic language learning research. In addition, the characteristics of the students at this madrasa are fairly

representative of the conditions of Arabic language learning in MI in general, both in terms of socio-economic backgrounds and diverse academic abilities.

The population in this study consists of all fourth-grade students at MI Muhammadiyah 1 Yogyakarta for the 2024/2025 academic year, totaling 58 students distributed across two learning groups. The sampling technique used is purposive sampling, which involves selecting samples based on certain considerations relevant to the research objectives. The main considerations in selecting the sample are the equality of initial Arabic language proficiency between the two classes based on the average grades from the previous semester, a relatively balanced number of students to meet statistical requirements, and the scheduling of Arabic language lessons that allows the researcher to conduct observations optimally. After going through the selection process based on those criteria, class IV-A with a total of 29 students was chosen as the experimental group and class IV-B with a total of 29 students was chosen as the control group, making the total research sample 58 students consisting of 31 male students and 27 female students.

The variables studied in this research consist of two main categories. The independent variable is the use of gamification in learning Arabic vocabulary, which is operationally defined as the integration of game mechanics elements such as point systems, level progression, digital badges, leaderboards, learning quests, and reward systems into Arabic vocabulary learning activities. Gamification in the context of this study does not mean turning learning entirely into a game, but rather adopting game principles that have been proven to boost motivation and engagement to be applied in a formal learning context that still has clear educational objectives. The dependent variable is the mastery of Arabic vocabulary by fourth-grade MI students, which is measured through students' abilities in five aspects of language skills, namely: recognizing the written forms of vocabulary, understanding the meanings of vocabulary in Indonesian, recalling vocabulary that has been learned over a certain period, pronouncing vocabulary correctly according to proper articulation rules, and using the vocabulary in simple sentences appropriately within the correct communication context.

Data collection in this study was conducted through four complementary techniques to obtain comprehensive and valid data. The first technique was testing, which consisted of written and oral tests designed to measure students' mastery of vocabulary before and after the treatment. The written test included 40 items, consisting of 20 multiple-choice questions to measure the ability to recognize and understand vocabulary, 10 short-answer questions to measure the ability to recall and apply vocabulary in sentences, and 10 translation questions to measure understanding of meaning both receptively and productively. Meanwhile, the oral test consists of 10 questions that assess students' ability to read vocabulary with correct pronunciation and use the vocabulary in conversations or simple sentences. The vocabulary material tested covers three main themes found in the fourth-grade Arabic curriculum for the even semester, namely *Al-Adawat al-Madrasiyyah* (School Supplies), *Al-Usrah* (Family), and *Al-Mihnah* (Profession), with a total of approximately 45 new words learned during the research period.

The second technique is a questionnaire used to collect data on the responses of the experimental group students to vocabulary learning with a gamification approach. This questionnaire is designed using a Likert scale with five answer choices ranging from Strongly Agree to Strongly Disagree and consists of 20 statements covering four main dimensions: students' learning motivation after participating in gamified learning, students' interest in the game elements integrated into the learning, the perceived ease of use of the gamification platform employed, and the benefits perceived by students regarding the improvement of their ability to master vocabulary. The questionnaire was given to the experimental group students at the end of the treatment period to capture their learning experience is direct and authentic.

The third technique is structured observation conducted to systematically observe the process of implementing gamification in vocabulary learning, as well as the behavior and activities of students during the learning process. The observation was carried out by the researcher with the assistance of two trained observers using prepared observation sheets, which included aspects

such as the execution of each learning stage according to the designed Lesson Plan, the level of active student participation in each gamification activity, students' enthusiasm and emotional responses to the applied game elements, patterns of student interaction with the digital learning media used, and various technical and non-technical obstacles that emerged during the learning process. Observations were conducted at every learning session to obtain a comprehensive picture of the learning dynamics that occurred. The fourth technique is documentation, which is used to collect supporting data in the form of official school documents such as syllabi and the Arabic Language Lesson Plan for fourth grade, visual recordings in the form of photos and videos of learning activities for more in-depth analysis, screenshots from the gamification platform showing scores, achievements, and student rankings, student grade lists as comparative data, as well as school profiles and student demographic data relevant to the analysis.

The research instruments used have undergone a process of validation and reliability testing to ensure that the measurement tools truly measure what they are supposed to measure and provide consistent results. The validity of the test and questionnaire instruments was tested using content validity through the assessment of three experts, consisting of one Arabic language lecturer from Sunan Kalijaga State Islamic University Yogyakarta, one senior Arabic language teacher at MI with more than 15 years of experience, and one learning evaluation expert from the Educational Technology study program. The three experts provided an assessment of the suitability of the instrument items with the indicators to be measured, the clarity of the language and wording, as well as the appropriateness of the difficulty level with the characteristics of fourth-grade MI students.

C. RESULTS

1. Improvement of Vocabulary Mastery in the Experimental and Control Group

This research produced quantitative data in the form of scores on Arabic vocabulary mastery tests obtained from pretests and posttests in the experimental group and the control group, as well as qualitative data in the form of students' response questionnaires and learning observation sheets. The pretest and posttest results of both groups are presented in the following table to provide a clear picture of students' achievements before and after the treatment was administered.

Table 1. Descriptive Statistics of Pretest and Posttest Results

Group	Test	N	Minimum Skor	Maximum Skor	Std. Deviation
Experimental (IV-A)	Pretest	29	45	72	7.83
	Posttest	29	75	98	6.25
Control (IV-B)	Pretest	29	42	70	8.15
	Posttest	29	58	85	7.42

Based on the table above, it can be seen that the average pretest score of the experimental group was 58.62 with a standard deviation of 7.83, while the control group had an average pretest score of 57.24 with a standard deviation of 8.15. This relatively small difference in average pretest scores indicates that both groups had relatively similar initial abilities before the treatment was administered. After the treatment, the experimental group's average posttest score increased significantly to 86.48 with a standard deviation of 6.25, showing an improvement of 27.86 points from the pretest score. Meanwhile, the control group also showed improvement, but not as much as the experimental group, increasing from an average of 57.24 to 71.38, or an improvement of 14.14 points. The minimum and maximum scores on the posttest for the experimental group also showed a higher range compared to the control

group, indicating that learning with a gamification approach was able to encourage most students to achieve higher scores.

Before conducting hypothesis testing using parametric statistics, a prerequisite analysis test is first carried out to ensure that the obtained data meet the required assumptions. The prerequisite tests performed include tests for data normality and variance homogeneity. The normality test is conducted to determine whether the pretest and posttest data in both groups are normally distributed or not. The normality test uses the Shapiro-Wilk test, which is suitable for samples with fewer than 50 participants. The results of the normality test are presented in the following table.

Table 2. Data Normality Test Results

Group	Test	Statistic	df	Sig.	Description
Experiment	Pretest	0.962	29	0.127	Normal
	Posttest	0.968	29	0.156	Normal
Control	Pretest	0.958	29	0.089	Normal
	Posttest	0.965	29	0.142	Normal

Based on the results of the Shapiro-Wilk test presented in the table above, all data, both pretest and posttest in both groups, showed significance values greater than 0.05, which means that all data are normally distributed. The pretest significance value for the experimental group was 0.127, the posttest for the experimental group was 0.156, the pretest for the control group was 0.089, and the posttest for the control group was 0.142. Thus, the assumption of data normality has been met, and the analysis can proceed using parametric statistics.

Homogeneity testing was conducted to determine whether the variances of the two groups were homogeneous or not. Homogeneity testing was carried out using Levene's Test for Equality of Variances. The results of the homogeneity test are presented in the following table.

Table 3. Results of Variace Homogeneity Test

Data	Levene Statistics	df1	df2	Sig.	Description
Pretest	0.982	1	56	0.326	Homogen
Posttest	0.674	1	56	0.418	Homogen

The homogeneity test results show that the significance value for the pretest data is 0.326 and for the posttest data is 0.418, both of which are greater than 0.05. This indicates that the variance of the data in both groups is homogeneous, thus the assumption of variance homogeneity has been met and the analysis can proceed using an Independent Sample t-Test.

After the prerequisite tests for analysis were met, a hypothesis test was conducted using the Independent Sample t-Test to examine whether there is a significant difference between the average posttest scores of the experimental group and the control group. The hypotheses tested are as follows:

- **H_0**: There is no significant difference in Arabic vocabulary mastery between students who learn using a gamification approach and those who learn using conventional methods.
- **H_1**: There is a significant difference in the mastery of Arabic vocabulary between students who learn through a gamification approach and those who learn using conventional methods.

Table 4. Independent Sample t-Test Results

Data	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Posttest	8.342	56	0.000	15.10	1.81

The results of the Independent Sample t-Test showed a t-value of 8.342 with degrees of freedom (df) of 56 and a significance value (2-tailed) of 0.000, which is much smaller than 0.05. This means that H_0 is rejected and H_1 is accepted, indicating that there is a significant difference in Arabic vocabulary mastery between the experimental group of students who learned using a gamification approach and the control group who learned using conventional methods. The mean difference between the two groups is 15.10 points, showing that the experimental group has a significantly higher average score compared to the control group.

To determine the extent of improvement in vocabulary mastery in each group, an N-Gain calculation was carried out to measure the effectiveness of the treatment in enhancing students' abilities. The N-Gain calculation uses the formula developed by Hake (1999), which is the difference between the posttest and pretest scores divided by the difference between the maximum score and the pretest score. The results of the N-Gain calculation are presented in the following table.

Table 5. N-Gain Analysis Results

Group	Pretest Average	Posttest Average	N-Gain	Categori
Experiment	58.62	86.48	0.67	Currently
Control	57.24	71.38	0.33	Currently

The N-Gain analysis results show that the experimental group had an N-Gain value of 0.67, which falls into the medium category ($0.30 \leq$ N-Gain ≤ 0.70), while the control group had an N-Gain value of 0.33, also falling into the medium category. Although both groups are in the medium category, the N-Gain value of the experimental group is higher than that of the control group by 0.34 points, indicating that learning with a gamification approach has a greater effect on students' mastery of Arabic vocabulary. The N-Gain value of the experimental group, which is close to the upper limit of the medium category (0.70), suggests that the gamification approach is quite effective in improving vocabulary mastery, although it has not yet reached the high category.

2. Student Responses and Motivation to Learn Regarding Gamification

The student response questionnaire was given to 29 students in the experimental group to determine their responses to vocabulary learning using a gamification approach. The questionnaire consisted of 20 statements covering four main dimensions: learning motivation, interest in gamification, ease of use, and perceived benefits. Each statement used a Likert scale with five response options scored from 1 to 5. The results of the student response questionnaire analysis are presented in the following table.

Table 6. Results of the Student Response Questionnaire Analysis

Dimension	Score Average	Persentase	Categori
Learning motivation	4.28	85.6%	Very Positive
Interest in gamifikation	4.45	89.0%	Very Positive
Ease to use	4.15	83.0%	Very Positive

The benefits experienced	4.32	86.4%	Very Positive
Overall Average	**4.30**	**86.0%**	**Very Positive**

The results of the questionnaire analysis indicate that students' responses to vocabulary learning using a gamification approach were very positive, with an overall average score of 4.30 out of 5, or equivalent to 86.0%. The dimension of interest in gamification received the highest score, with an average of 4.45 (89.0%), indicating that students were very interested in the game elements integrated into the learning process, such as point systems, badges, leaderboards, and quests. The dimension of perceived benefits obtained an average score of 4.32 (86.4%), indicating that students felt tangible benefits from gamified learning in improving their mastery of vocabulary. The learning motivation dimension obtained an average score of 4.28 (85.6%), showing that gamification successfully increased students' motivation to learn Arabic, which was previously considered difficult and boring. As for the ease-of-use dimension, it received the lowest score but was still in the very positive category with an average of 4.15 (83.0%), indicating that although a small number of students experienced technical difficulties operating the digital platform, overall they felt that the platform used was quite easy and user-friendly.

Learning observation was conducted at each meeting over six weeks to observe the implementation process of gamification and student activities during learning. The aspects observed included the feasibility of the learning steps, student participation, student enthusiasm, interaction with media, and classroom management. The results of the observation analysis are presented in the following table.

Table 7. Learning Observation Analysis Results

Observed Aspects	Score Average	Categori
Implementation of Learning Steps	3.67	Very good
Active Student Participation	3.83	Very good
Enthusiasm and Emotional Response	3.92	Very good
Interaction with Gamification Media	3.75	Very good
Classroom Management	3.58	Very good
Overall Average	**3.75**	**Very good**

The observation results indicate that the implementation of gamification in vocabulary learning was very successful, with an overall average score of 3.75 out of 4. The aspects of student enthusiasm and emotional response received the highest scores, averaging 3.92, which shows that students were very enthusiastic and displayed expressions of excitement during gamified learning, especially when they completed quests, earned badges, or saw their names on the leaderboard. The aspect of active student participation received an average score of 3.83, indicating that almost all students were actively engaged in every learning activity, unlike conventional learning where only some students are active. The aspect of interaction with gamification media received an average score of 3.75, indicating that students were able to interact well with the digital platform used, although some students required technical assistance during the initial sessions. The aspect of the feasibility of implementing learning steps received an average score of 3.67, indicating that the teacher was able to carry out all stages of learning according to the lesson plan that had been designed, although sometimes adjustments in time were necessary due to high student enthusiasm. The aspect of classroom management received the lowest score, yet it still falls into the very good category with an average of 3.58, indicating that although the classroom atmosphere became livelier and more dynamic with the presence of gamification, the teacher was still able to manage the class well and direct the students' energy toward productive learning activities.

3. Implication, Challenges, and Comparison with Conventional Methods

Several challenges and obstacles encountered during the implementation of gamification provide valuable lessons for future research and practice. Technical constraints such as limited devices (only one LCD projector was available to display the leaderboard), unstable internet connections at times, and the fact that not all students had their own smartphones to access the gamification platform required creative solutions, such as using a buddy system where students without devices paired up with those who had them. In addition, teachers require a significant amount of time and effort to prepare gamified content on various platforms, create questions, design quests, and manage points and badge systems, which may not be sustainable if it has to be done for every meeting without technological support or a support team. This indicates that the optimal implementation of gamification requires investment in technological infrastructure, teacher training, and possibly the development of customized platforms tailored to the needs of Arabic language learning in MI.

The theoretical implication of this research is to strengthen the empirical evidence that foreign language learning, particularly vocabulary, does not have to be through boring drill and practice methods, but can be done through a fun and meaningful approach without compromising academic effectiveness. This study also contributes to the literature on Arabic language learning in Indonesia by showing that approaches developed for learning English or other foreign languages can be adapted and applied to Arabic with adjustments appropriate to the linguistic and cultural characteristics of the Arabic language. In addition, this study adds evidence that the characteristics of Generation Alpha as digital natives are not just a challenge but also an opportunity for learning innovation, where the right digital technology can serve as a catalyst to significantly improve the quality of learning.

The practical implication of this research is to provide a concrete and evidence-based model that can be replicated by Arabic language teachers in other MI schools to improve the quality of vocabulary learning. This study shows that the implementation of gamification does not have to be complicated or require highly advanced technology, but can be done by utilizing platforms that are already available for free or at a low cost, such as Kahoot!, Quizizz, and Wordwall, which are relatively easy to learn and use by teachers with moderate digital literacy. However, the success of gamification implementation does not only depend on technology but also on thoughtful instructional design, teachers' understanding of gamification principles and motivational psychology, as well as teachers' ability to integrate technology with pedagogy harmoniously in what is known as Technological Pedagogical Content Knowledge (TPACK).

D. DISCUSSION

The results of this study indicate that the use of gamification in learning Arabic vocabulary in the fourth grade of MI is proven to be effective in significantly improving students' mastery of vocabulary compared to conventional learning methods. These findings are in line with previous research showing that gamification has great potential in enhancing students' motivation and learning outcomes (A et al. 2025). The significant improvement in the experimental group can be explained through several interrelated theoretical and practical perspectives.

From the perspective of motivation theory, gamification successfully activates students' intrinsic motivation by fulfilling three basic psychological needs based on the Self-Determination Theory proposed by Deci and Ryan, namely the need for competence, autonomy, and relatedness (Muttaqin, Zuhdi, and Ridwan 2025). Point elements and badges provide immediate feedback on student achievements, allowing them to feel an increase in competence in mastering vocabulary, which in turn boosts their confidence (Maghfirah et al. 2024). A tiered level system gives students a sense of autonomy to progress at their own learning pace, while leaderboards and group activities create a sense of social connection with classmates in a competitive yet supportive context (Lutviana, Amrulloh, and Laili 2025). The combination of these three elements creates a

psychologically satisfying learning experience, which is different from conventional learning that tends to rely solely on extrinsic motivation in the form of grades or praise from teachers (Rizqiya et al. 2025).

From the perspective of cognitive theory, gamification facilitates the processes of encoding, storage, and retrieval of information in long-term memory through various effective mechanisms (Srimuliyani 2023). Repetition of vocabulary in the context of fun and varied games (such as quizzes on Kahoot!, memory games on Wordwall, and role play) creates stronger elaborative rehearsal compared to monotonous mechanical memorization (Riwanda, Ridha, and Islamy 2021). Every time students use vocabulary in different game contexts, they create multiple retrieval cues, making it easier to recall the vocabulary when needed (Fuadiyah, Hanifah, and Akhadiyah 2025). In addition, the positive emotions that arise during gamified learning, such as excitement, pride in succeeding, or even a bit of constructive frustration when facing challenges, all serve as emotional tags that make information more memorable (Widodo, Sari, and Ainak 2023). Research in the field of educational neuroscience shows that information associated with positive emotions tends to be more easily remembered and stored in long-term memory because it involves the activation of the amygdala, which plays a role in memory consolidation (Amelia, Sartono, and Pasani 2020).

Based on Vygotsky's social learning theory perspective, social elements in gamification such as leaderboards, group work, and peer evaluation create a zone of proximal development where students learn not only from teachers but also from their peers (Doolitle 1995) (Lestari, Ndona, and Gultom 2024). Students who quickly master vocabulary indirectly become role models for their classmates, while the healthy competition that occurs encourages students to work harder to improve their skills. Collaborative activities such as creating a family tree or role-playing professions allow for scaffolding, where students help each other and complement each other's understanding, creating a richer learning experience compared to learning individually (Akmali and Kusaeri 2024). In addition, public recognition through badges and leaderboard positions provides strong social reinforcement for students to continue performing well, because humans are basically social creatures who seek acknowledgment and appreciation from their social environment (Rosida and Wahyuningsih 2024).

The characteristics of Generation Alpha students, who are digital natives, make them more responsive to technology-based and gamified learning compared to previous generations (McCrindle and Fell 2020). They grew up in an environment full of visual stimulation, interactivity, and instant gratification from various apps and digital games, making traditional learning, which is static and passive, feel less engaging to them (Utami et al. 2025). Gamification bridges the gap between the natural learning styles of Generation Alpha and the demands of the formal curriculum by presenting learning materials in a format that is familiar and engaging for them (Nuryadin et al. 2025). Platforms like Kahoot!, Quizizz, and Wordwall use colorful interface designs, dynamic animations, energetic sound effects, and interactive elements that provide immediate responses, all of which align with the cognitive preferences of digital-era students who are accustomed to multisensory input and rapid feedback loops (Nasir 2024).

Variety in activities in gamified learning prevents boredom and cognitive fatigue that often occur in monotonous conventional learning (Lutviana et al. 2025). Each meeting is designed with a combination of various activities such as individual quizzes, memory games, group work, presentations, and role play, so that students continuously experience novelty that stimulates their attention and engagement (Fuadiyah et al. 2025). The dynamic shift between activities also accommodates various student learning styles, ranging from visual learners who benefit from images and animations, auditory learners who are aided by sound effects and discussions, to kinesthetic learners who are facilitated through role play and physical activities (Hawa 2021). The differentiated instruction approach integrated into this gamification design ensures that every student has the opportunity to learn in the way that is most effective for them (Hawa 2021).

The immediate feedback system in gamification provides students with real-time information about their performance, allowing for quick error correction and strategy adjustment (Freitas et al. 2017; Hadijah, Isnarto, and Walid 2022). In conventional learning, students often have to wait for days or even weeks to receive feedback from teachers on their work, which makes the learning process inefficient because the same mistakes keep repeating. In contrast, on gamification platforms, every wrong answer is immediately corrected, and students can try again right away or learn the correct answer, creating rapid learning cycles that accelerate mastery of the material (Mahmubi and Homaidi 2025). Feedback presented in an enjoyable form, such as funny memes or celebration animations, also reduces the negative emotional impact of mistakes, so students do not feel afraid or embarrassed to try and make mistakes, which is actually an important part of the learning process (Hadijah et al. 2022).

Reward and recognition elements in gamification create strong positive reinforcement to shape desired learning behaviors (Firdaus and Hendradjaya 2021). Every time students successfully complete a quest, achieve a high score, or level up, they receive rewards in the form of points, badges, or leaderboard positions, which activate the reward pathway in the brain and release the neurotransmitter dopamine that provides a pleasurable sensation (Amelia et al. 2020; Wathon 2015). This sensation makes students want to repeat the behavior that produces the reward, which is studying and mastering vocabulary more diligently (Puspitoningrum, Nurnoviyati, and Suhartono 2024). In the long term, this consistent positive reinforcement can shape good learning habits, where students learn not just because of external demands but because they enjoy the learning process itself (Syawaludin and Marmoah 2018). However, it should be noted that in this study, rewards are not only external but also intrinsic through a sense of achievement and mastery, so they do not create an unhealthy dependency on external rewards (Suoth, Mutji, and Manutede 2022).

Gamified learning creates a context for language use that is more authentic and meaningful compared to conventional learning, which tends to be decontextualized (Gani et al. 2024). In activities such as professional role play or creating a family tree, students do not just memorize vocabulary in isolation but use it in the context of real communication that is relevant to their lives (Nasir 2024). Meaningful learning like this, according to Ausubel's theory, results in deeper understanding and longer retention compared to rote learning or mechanical memorization (Ghazali 2009). Students not only know that mudarrisun means teacher, but they understand when and how to use the word in a sentence, what the role of a teacher is, and how to describe it in Arabic, which is a much higher level of understanding (Mustaufiy 2022).

The competitive dimension in gamification, especially through leaderboards, turns out to have a complex impact and needs to be managed wisely. Observations show that leaderboards successfully motivate most students to compete healthily and increase their efforts, but there are also some students with lower abilities who feel pressured or lose motivation because they are always at the bottom. To address this, teachers need to design an assessment system that is not only based on absolute scores but also on individual progress, so that each student can feel their own achievements regardless of comparisons with other students (Kamaruddin and Haryanto 2014). In addition, badges for various types of achievements such as 'Most Improved' or 'Best Effort' can ensure that every student has the opportunity to receive recognition, not just those with the highest academic abilities (Zebua and Zebua 2024).

Although the research results show significant effectiveness, the N-Gain value of the experimental group, which falls into the moderate category (0.67), indicates that there is still room for improvement and optimization. Some factors that may limit achieving a high category include the research duration of only four weeks, which might not be sufficient to produce very dramatic changes in foreign language proficiency. Furthermore, although the digital platform used is fairly user-friendly, some students still experienced technical difficulties such as slow internet connections or unfamiliarity with using digital devices, which slightly disrupted the smoothness of the learning process. Another factor is that gamification in this study is still limited to the use

of available platforms such as Kahoot! and Quizizz, which, although effective, are not specifically designed for Arabic language learning and therefore have limitations in accommodating the unique characteristics of Arabic, such as a different writing system and complex grammar rules.

Comparison with the control group, which also showed improvement though not as much as the experimental group, indicates that conventional methods are not entirely ineffective, but they have limitations in terms of student engagement and motivation. Conventional learning through lecturing and memorization can indeed lead to vocabulary mastery in the short term, but it tends to be less effective in building long-term retention and the ability to apply knowledge in different contexts (Aziz and Giyoto 2023). The observations in the control group showed that many students appeared passive, bored, or even sleepy during the lesson, and only a small number of students actively participated in answering the teacher's questions. In contrast, in the experimental group, almost all students were actively involved, enthusiastic, and even reluctant for the lesson to end, which is a strong indicator of intrinsic motivation that has been established.

Hasil angket respons siswa yang sangat positif (86%) memberikan validasi tambahan terhadap The effectiveness of gamification from a user experience perspective. Students not only show objective improvements in learning outcomes through tests but also express subjective satisfaction and enjoyment with their learning experience, which is an important indicator of learning quality. When students enjoy the learning process, they are more likely to be open to further learning, more motivated to engage in self-directed learning, and develop a positive attitude towards Arabic that can have a long-term impact on their academic success (A et al. 2025). This is very important in the context of learning a foreign language, which requires long-term commitment and consistent practice to achieve proficiency.

E. CONCLUSIONS

The design of gamification implementation in learning Arabic vocabulary for fourth-grade MI students is crafted by integrating game mechanics elements such as a points system, level hierarchy, digital badges, leaderboards, learning quests, and reward systems through digital platforms like Kahoot!, Quizizz, and Wordwall. The learning is conducted over six sessions covering three vocabulary themes*: Al-Adawat al-Madrasiyyah* (School Equipment*), Al-Usrah* (Family), and *Al-Mihnah* (Profession) with a total of 45 new words. Each session is packaged with a variety of dynamic activities such as interactive quizzes, memory games, group work, presentations, and role play tailored to the characteristics of Generation Alpha students.

The use of gamification has been proven effective in significantly improving the Arabic vocabulary mastery of fourth-grade MI students. This is evidenced by the results of the Independent Sample t-Test, which showed a t-value of 8.342 with a significance of 0.000 ($p<0.05$), indicating a significant difference between the experimental group and the control group. The average post-test score of the experimental group was 86.48, higher than the control group at 71.38, with a difference of 15.10 points. The N-Gain value of the experimental group was 0.67 (moderate category), also higher than the control group at 0.33 (moderate category), indicating that gamification has a greater effect on improving students' vocabulary mastery.

Students' response to vocabulary learning with a gamification approach was very positive, with an overall percentage of 86.0%. The dimension of interest in gamification received the highest score (89.0%), followed by perceived benefits (86.4%), learning motivation (85.6%), and ease of use (83.0%). Observation results of the learning process also showed that the implementation of gamification ran very well, with an average score of 3.75 out of a 4-point scale, with the aspect of student enthusiasm receiving the highest score (3.92). This indicates that gamification is not only effective in improving learning outcomes objectively, but also creates an enjoyable and meaningful learning experience for students. Overall, this study proves that the use of gamification with elements such as points, levels, badges, leaderboards, quests, and rewards through platforms like Kahoot!, Quizizz, and Wordwall is an effective learning approach to enhance the mastery of Arabic vocabulary for fourth-grade MI students and aligns with the

characteristics of students in the digital era. Gamification successfully transforms vocabulary learning from a boring activity into an enjoyable, challenging, and meaningful learning experience.

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