

Assessing the Impact of Gamification on Academic Achievement and Student Perceptions of Learning Arabic Grammar: A Quasi-Experimental Study

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Abstract

This quasi-experimental study aims to determine the impact of integrating gamification into teaching Arabic grammar on academic achievement for second-year students at As-Sofa International Islamic College and evaluate students' impressions of incorporating gamification into learning Arabic grammar. Through a descriptive-analytical approach and quasi-experimental methodology, this study was conducted on a sample consisting of 64 students who were divided into two groups: an experimental group and a control group. The duration of the study was eight weeks. A t-test was conducted to analyse the results of the achievement pre and post-test, and the mean and standard deviation were used to analyse the questionnaire results. The study found an indirect positive effect of gamification in improving students' academic achievement in Arabic grammar, and positive impressions of students about incorporating gamification into learning Arabic grammar. The study showed that gamification could inspire poor learners struggling to become high achievers. Additionally, the present study could contribute to the usefulness of language learners by enhancing their problem-solving skills and restoring their knowledge of grammar practice during the learning process.

Keywords: Gamification, Academic Achievement, Arabic Grammar, Arabic Learning As A Foreign Language.

Introduction

Gamification is a learning approach that involves integrating game design elements and mechanics into non-game contexts to enhance motivation and engagement in the learning process. It involves using game-like features such as points, levels, badges, and leader-boards

to increase interest and engagement in the subject being taught (Abdelhamid et al., 2022; Flores, 2015).

Gamification has become a popular teaching method in recent years, particularly in language learning. By gamifying a language lesson, learners are motivated to engage with the content in a fun and interactive way. This can be especially useful for students who may find language learning to be challenging or boring (Palaniappan, 2022; Lam, 2013; Hamari, 2014; Buckley, 2017).

In the context of Arabic grammar education, gamification can help students improve their academic achievement by making the learning process more enjoyable and engaging. By incorporating game-like elements into lessons, students are encouraged to participate and collaborate with one another, which can enhance their understanding of the subject matter.

Additionally, gamification can help to develop problem-solving skills, critical thinking, and decision-making abilities. By engaging in game-like challenges, students are encouraged to think creatively and strategically, which can be beneficial for their overall academic success.

However, gamification should not be seen as a replacement for traditional teaching methods but rather as a complementary approach. It is important to strike a balance between traditional teaching methods and gamification to ensure that students are learning the necessary skills and knowledge to succeed academically (Norman, 2020; Zeriaf, 2018; Reinders, 2012).

Overall, gamification can be a valuable teaching method in Arabic grammar education, as it can help to increase motivation, engagement, and academic achievement among students.

Non-native students face several challenges when learning the Arabic language, including shyness, lack of self-confidence, and fear of making mistakes. These challenges have been identified by various researchers, such as (Faizuddin et al., 2016; Haron et al., 2016; Shafie et al., 2019). According to Abdul Hamid et al (2020), Arabic is often perceived as a difficult and boring language to learn due to the limited resources available for teaching and learning.

After reviewing relevant literature and previous studies, the researchers observed a severe lack of experimental studies that examine the impact of gamification on learning the Arabic language. Furthermore, most of the experimental studies on gamification have only focused on specific aspects of language learning, such as vocabulary and conversation. These studies often aim to increase students' motivation without addressing the impact of gamification on academic achievement.

Problem Statement

The weakness of Arabic language instruction manifests in various forms, particularly in low academic achievement, particularly in grammar. Several studies, including those conducted by (Halim, 2009; Faizuddin et al., 2016; Haron et al., 2016; Shafie et al., 2019; Abdul Hamid et al., 2020) have demonstrated the prevalence of poor academic achievement among university students in Malaysia studying the Arabic language. This phenomenon can be attributed to internal factors, such as shyness, lack of confidence, and fear of making mistakes, as well as external factors related to the traditional ways of learning that do not provide sufficient opportunities for students to practice and communicate in Arabic. These factors negatively affect the academic achievement of students.

The absence of sufficient resources in educational institutions can result in deficiencies in teaching foreign languages, especially government-mandated ones. As a result, educational

research plays a vital role in offering innovative, cost-effective alternative solutions to enhance the learning process (Rachels, 2016). While there are free or low-cost language-learning applications that incorporate gamification, more empirical research is necessary to investigate their efficacy. According to a study, identifying an effective gamification platform or learning application is one of the most challenging tasks for educators (Shuler, 2012; Mussab, 2015; Debbita et al., 2018).

In recent years, gamification has gained widespread recognition and has been successful in increasing motivation, engagement, and interaction among students in some educational aspects (Palaniappan & Noor, 2022; Lam, 2013; Siham, 2016; Buckley & Doyle, 2017). However, the efficacy of gamification in improving students' academic achievement in learning grammar has not been explored yet. Therefore, this study is a preliminary step to determine the effect of incorporating canonization on academic achievement in learning Arabic grammar.

Study Questions

1. What is the effect of integrating gamification into learning Arabic on the academic achievement of second-semester students at As-Sofa International Islamic College in Arabic grammar?
2. What are the students' opinions on integrating gamification into their Arabic grammar learning at As-Sofa International Islamic College?

Objectives of the Study

1. To determine the effect of integrating gamification into learning Arabic on the academic achievement of second-semester students at As-Sofa International Islamic College in Arabic grammar.
2. To identify the students' opinions on integrating gamification into their Arabic grammar learning at As-Sofa International Islamic College.

Theoretical Framework of the Study

The researchers utilized two theories to underpin the use of gamification: Siemens' (2005) connectivism theory, and Vygotsky's (1978) zone of proximal development and scaffolding theory. According to the connectivism theory, knowledge is not solely contained within an individual's mind, but is also present in the surrounding world, and accessed through participation in various activities. This theory highlights the relationship between learning and technology, with learning only occurring when individuals exchange knowledge and opinions with one another (Siemens, 2005; Flores, 2015; Mussab, 2015). Based on this theory, the researchers aim to leverage gamification to guide students in searching, reviewing, analyzing, and synthesizing information, in order to acquire knowledge. By utilizing cooperative and group learning strategies, students can improve their collaboration skills, boost their self-confidence, and overcome negative emotions such as anxiety, fear, and shyness. Thus, the researchers have adopted these strategies to implement gamification in their study.

Vygotsky's (1978) theory suggests that during challenging tasks, there exists a zone of proximal development that provides an appropriate level of difficulty for the learner. This zone is the primary area of learning, and it evolves as the student progresses in their learning. The student may require support or scaffolding from a peer, teacher, or more knowledgeable individual to successfully complete the learning task. As the student gains more experience with the learning task, the scaffolding can be removed. Flores (2015) added that accomplished

students can act as scaffolders for their weaker peers, especially during challenging stages. Technological tools can also serve as scaffolding, where educational game systems can be designed as adaptive learning systems (Rachels, 2016; Valencia, 2016). With this in mind, the researchers sought to leverage technological tools to provide scaffolding for the students in this study.

The researchers utilized the gamification framework model (ADDIE), which consists of five main stages: 1) Analysis, 2) Description of players (learners), 3) Development of gamification activities and tools, 4) Implementation of gamification sessions, and 5) Evaluation and modification based on data and observations collected during the gamification sessions (Abdelhamid et al., 2018). The gamification activities were modified to achieve the study's objectives.

The independent variable in this study is the type of education (gamification versus traditional education), while the dependent variable is academic achievement in Arabic grammar for second-semester students at As-Sofa International Islamic College. Chart A illustrates the theoretical framework for this study.

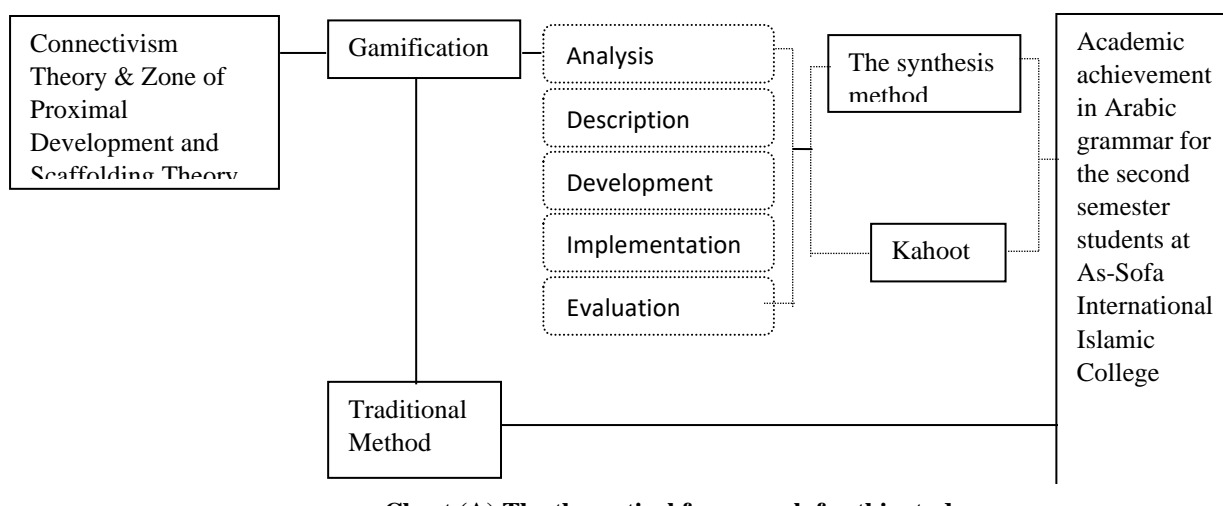


Chart (A) The theoretical framework for this study

Study Methodology and Procedures

The researchers utilized both the descriptive analytical and quasi-experimental methods for their appropriateness to achieve the objectives of the study. The sample for the study was purposefully selected and consisted of 64 students enrolled in the Arabic language course during the second semester at As-Sofa International Islamic College. The participants were divided into two groups, the experimental and control groups, each consisting of 32 students.

To determine the students' attitudes towards and willingness to integrate gamification into their education, an analytical descriptive study was conducted using a questionnaire comprising 10 items. The questionnaire was adapted from previous studies (Saleh et al., 2016; Azmi et al., 2018; Yahaya et al., 2019) with necessary modifications. The questionnaire's reliability and validity were tested using Cronbach's alpha, which yielded a score of 0.75, indicating acceptable reliability (Yahaya et al., 2019). The mean and standard deviation of the students' responses to the questionnaire items were analyzed and presented in Table 1.

Table 1

Students' Needs and Willingness to Integrate Gamification

	<i>Items</i>	1	2	3	4	5	<i>Mean</i>	<i>SD</i>			
1	I have prior knowledge about gamification.	-	3	8	42	11	3.95	.700			
2	I have a positive feeling about using gamification in learning.	-	-	11	42	11	4.00	.591			
3	I think gamification can increase my academic achievement.	-	5	13	39	7	3.98	.722			
4	Gamification can make the learning environment more active and effective.	-	-	7	33	24	4.28	.654			
5	I am ready to learn through gamification if the lecturers incorporate it into the teaching.	-	-	-	17	47	4.72	.453			
6	I want my teachers to integrate gamification into their education	-	-	-	15	49	4.77	.427			
7	I prefer competitive gamification activities individually and collectively	-	-	13	41	10	4.65	.492			
8	I think using gamification will make learning more fun	-	-	-	52	12	4.19	.393			
9	Gamification will encourage me to participate in the learning	-	-	9	28	27	4.33	.668			
10	Some of the lecturers have incorporated gamification into their teaching	-	-	3	22	39	4.56	.588			
		<i>1- I totally disagree.</i>		<i>2- I do not agree.</i>		<i>3- Not sure.</i>		<i>4- I agree.</i>		<i>5- I totally agree</i>	

The data in Table 1 shows that the students have some prior knowledge about gamification (M=3.95) and hold positive attitudes towards it (M=4.00). They express a strong willingness to learn through gamification (M=4.72) and are ready to adopt this approach (M=4.53). They believe that gamification can make learning more enjoyable and foster interaction and participation in educational activities. These findings highlight the students' perceived need and readiness to incorporate gamification into their learning process, in order to enhance their academic achievement in Arabic grammar.

The researchers followed a systematic approach in developing the gamification activities, which included defining the gamification elements and tools required for its implementation. The experts were consulted to evaluate the proposed activities, and modifications were made based on their feedback. The researchers also created pre and post-tests to assess the impact of gamification on the students' academic achievement.

A pilot study was conducted on a sample of 15 students, and the reliability of the tests was determined by calculating the correlation coefficient between the two tests, which was found to be 0.84. The gamification sessions were implemented in two stages for the experimental group. The first stage involved cooperative learning strategies without the

gamification platform, and the second stage included the use of the Kahoot gamification platform. Three lectures were conducted in a hall, covering the first three topics of the Arabic grammar book. Both the experimental and control groups were taught in a traditional manner using the textbook. A pre-test was conducted for both groups before the gamification sessions began.

Finally, the performance of the experimental group was evaluated using a t-test, and the results were compared with the control group to determine the impact of gamification on academic achievement. The findings of this study were aimed at achieving the research objectives.

Results

To answer the first question in this study; What is the effect of integrating gamification into learning Arabic on the academic achievement of second-semester students at As-Sofa International Islamic College in Arabic grammar? The quasi-experimental approach was adopted using the pre-test and post-test tool (Campbell & Stanley, 1963), and the study sample was divided into two equal groups, one of which is an experimental group that uses gamification in learning, and a control group that learns in the traditional way (Rachels, 2016). The researchers conducted a t-test for two independent samples to analyse the results of the pre-test for the two groups, and the results were as shown in the following table (2):

Table (2)

T-test results for pre-test

Group	N	T value	Sig. (2-tailed)
Experimental group	32		
Control group	32	0.494	0.623

From the table of results of the t-test for two independent samples, the pre-test results show that the value of (t) = 0.494, P-value = 0.623 which is greater than 0.05. Therefore, the null hypothesis is accepted, indicating that there are no significant differences between the experimental and control groups (Rachels, 2016).

Post-test Results Analysis

The two groups were allocated to separate classrooms for the remainder of the study, where the control group received traditional instruction and the experimental group received instruction integrated with Kahoot gamification for six weeks covering six grammar topics. Afterwards, the researchers conducted a t-test for two independent samples to compare the post-test results of the experimental and control groups.

Null Hypothesis: The integration of gamification has no impact on academic achievement in Arabic grammar for second-semester students at As-Sofa International Islamic College.

Alternative Hypothesis: The integration of gamification has an impact on academic achievement in Arabic grammar for second-semester students at As-Sofa International Islamic College.

The researchers conducted a t-test for two independent samples for the results of the post-test between the experimental group and the control group. The results of the t-test were as shown in the following table (3):

Table (3)

T-test results for post-test

Group	N	T value	Sig. (2-tailed)
Experimental group	32		
Control group	32	3.01	0.01

The results shows that the value of (t) = 3.01, P-value = .001 which is less than 0.05. Which indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis that there is a statistically significant difference in the level of academic achievement of the Arabic language for non-native speakers in Arabic grammar from the second semester students at Al-Safa International Islamic College who were taught by gamification, as opposed to those who were taught in the traditional way.

Comparison of the Results of The Pre and Post-test for the Control Group

The researchers conducted a Paired Samples T-test to compare the results of the pre-test and post-test for the control group, to determine the direction of the influence of the independent variable. The results for the control group were as shown in the following table (4)

Table (4)

Paired Samples T-test for the results of the pre-test and post-test of the control group

Test	N	Mean	T value	Sig. (2-tailed)
Pre-test	32	24.8125		
Post-test	32	23.000	3.092	0.004

The comparison table between the pre- and post-test for the control group indicates that the t-value = 3.092 and that the P-value = (0.004) which is less than (0.05), which indicates the rejection of the null hypothesis and acceptance of the alternative hypothesis that there are statistically significant differences between the two pre- and post-tests of the group Controller. As for the direction of influence, we deduce it from the mean of the pre-test = 24.8125, which is higher than the mean of the post-test = 23.000, with a difference in the mean = 1.8125 in favour of the pre-test.

Comparison of the Results of the Pre and Post-test for the Experimental Group

As for the results of the paired samples T-test to compare the results of the pre and post-test for the experimental group, the results were as in the following table (5)

Table (5)

Paired Samples T-test for the results of the pre-test and post-test of the control group

Test	N	Mean	T value	Sig. (2-tailed)
Pre-test	32	24.2813		
Post-test	32	26.1250	4.278	0.001

The comparison table between the pre and post-test for the experimental group indicates that the T value = 4.827 and P value = 0.001 which is less than 0.05. Which indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis that there is a statistically significant difference between the pre and post-tests of the experimental group. As for the direction of influence, we deduce it from the mean of the pre-

test to = 24.2813 which is higher than the mean of the post-test = 26.1250, with a difference in the mean of 1.84375 in favour of the post-test.

Upon comparing the results, it was found that integrating gamification led to a noticeable improvement in the academic achievement of students in learning Arabic grammar, as evidenced by the higher average scores in the post-test compared to the pre-test. In contrast, comparing the pre- and post-test results for the control group suggests that traditional education had a negative impact on the students' grammar proficiency, with the average score in the post-test being lower than the pre-test. Refer to Chart B below for visualization:

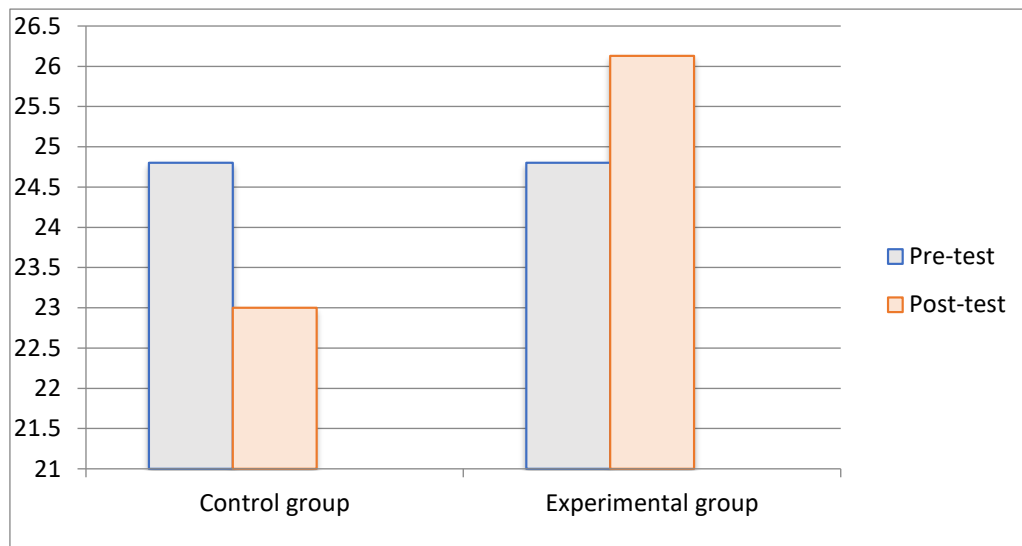


Chart B: comparison of the results of the two groups in the pre- and post-test

To answer the second question in this study; What are the students' opinions on integrating gamification into their Arabic grammar learning at As-Sofa International Islamic College? The researchers distributed a questionnaire to the students of the experimental group that implemented gamification to survey and evaluate their perceptions about the impact of integrating gamification in learning Arabic grammar. The results came as in table (6):

Table (6)

Assessment of students' impressions about incorporating gamification into learning Arabic grammar

Items	1	2	3	4	5	Mean	SD
7 Gamification activities increase my interest in grammar lessons	-	-	5	9	23	4.21	0.756
8 Incorporating gamification in learning grammar makes it more effective	-	2	3	9	18	4.11	0.397
9 Incorporating gamification helped me better understand the grammar lessons	-	-	-	8	24	4.75	0.440
10 Incorporating gamification increases the ease of learning grammar	-	-	-	9	23	4.72	0.440
11 Gamification activities encourage me to participate and interact	-	-	-	10	22	4.69	0.471
12 Gamification activities increase my ambition towards progress and achievement	-	-	-	10	22	4.69	0.471
13 Incorporating gamification improves reasoning abilities	-	-	9	15	8	3.97	0.740
14 Gamification increases my diligence in learning with a desire to win	-	-	-	15	17	4.53	0.507
15 Gamification activities helped me improve time management	-	-	10	8	14	3.97	0.861
16 Incorporating gamification helps me increase my academic achievement in grammar	-	-	12	9	11	4.75	0.440
17 I want to use gamification activities to learn other lessons	-	-	-	18	14	4.44	0.507

1- I totally disagree. 2- I do not agree. 3- Not sure. 4- I agree. 5- I totally agree

The analysis of the results of the questionnaire showed that gamification activities increased the students' interest in grammar lessons SD = 0.756 and M = 4.21. Incorporating gamification in learning grammar has made it more effective SD= 0.397 and M= 4.11. Gamification also helped them better understand the grammar lessons SD= 0.440 ,M= 4.75. Gamification has made it easy for them to learn grammar SD= 0.440 ,M= 4.72. Gamification activities encouraged them to participate and interact SD= 0.471 ,M= 4.69. Gamification activities increased their ambition towards progress and achievement SD= 0.471 ,M= 4.69. The students believe that incorporating gamification helped them increase their academic achievement in grammar SD= 0.440, M= 4.75. And they want to use gamification activities to learn the other lessons of grammar SD= 0.507, M= 4.44.

According to the results, the researchers observed a positive inclination among students towards integrating gamification into the learning of Arabic grammar. This is indicated by the highest recorded mean values, which reflect the students' belief that gamification has helped

them in improving their academic achievement and understanding of the lessons taught through this approach.

Findings and Conclusion

After analyzing the results of the study, the researchers confidently affirm that gamification is a powerful tool in enhancing the academic achievement of non-Arabic speaking students in Arabic grammar. This finding aligns with the positive outcomes discovered in previous studies, such as the research by (Tamjid, 2013; Imad et al., 2017) on gamification's positive effects on Arabic vocabulary acquisition and the study by (Belkhouche et al., 2014) that proved gamification's benefits in improving Arabic language skills.

Moreover, the results of this study agree with the study conducted by Al-Hadithy (2018) that employed Kahoot as a gamification platform in teaching English vocabulary. The Kahoot platform was found to be effective in English vocabulary acquisition for non-native students, corroborating earlier studies by (Reinders, 2012; Baierschmidt, 2013; Debita et al., 2018) that underscored the difficulty of finding effective gamification platforms. Therefore, the findings of the current study highlight Kahoot as one of the most effective gamification platforms for learning foreign languages.

Upon comparing the results of the pre-test and post-test of the control group, it was observed that the post-test scores were lower than the pre-test scores. This suggests that traditional teaching methods might contribute to poor academic achievement in Arabic grammar among students, as discussed in a previous study by (Faizuddin et al., 2016; Othman et al., 2022). This aligns with the findings of El-Shemy (2017), which indicate that traditional teaching methods can lead to disengagement and boredom among students, hindering their progress in language learning due to a lack of participation and interaction.

Based on the findings, the researchers suggest that the issue of poor academic performance among students in Arabic grammar does not solely stem from the Arabic language itself, but rather from several other factors, such as the use of traditional teaching methods and strategies in teaching Arabic. Thus, employing suitable techniques and tools that foster students' engagement and interaction during the learning process, such as gamification, could potentially enhance students' performance in Arabic grammar.

The findings of this study present a contradiction to the results of Dehaan et al.'s (2010) study, which suggested that traditional teaching methods were more effective than gamification. However, this discrepancy may be attributed to the difficulty of the gamification platform utilized in their study, which was noted by both (Dehaan et al., 2010; Baierschmidt, 2013) as having high cognitive demands that may distract students.

Not all gamification platforms are effective in achieving learning goals. A crucial factor for an appropriate gamification platform is its simplicity and clarity in the rules of play. This aligns with Vygotsky's (1978) concept of the zone of proximal development, where learners encounter challenges that require effort to understand and master. This zone is a critical component of learning and evolves as learners progress to higher stages of learning. Therefore, gamification platforms should be designed to facilitate rather than distract from the achievement of learning goals.

The use of gamification has a positive impact on students' motivation to learn Arabic grammar by increasing their interest in Arabic grammar lessons and encouraging them to strive and exert more effort to achieve success. This positive impact on motivation subsequently leads to improved academic achievement, as noted in previous studies (Wan et al., 2015; Andrea, 2014; Turan, 2016) that have emphasized the importance of students' willingness and desire to learn for academic success. The researchers conclude that the role of gamification in improving academic achievement is indirect, which is consistent with the findings of other studies (Kapp, 2016; Landers, 2015) that have highlighted the role of gamification in removing psychological barriers for students and enhancing their motivation. Specifically, the current study found that students who identified suitable learning strategies through gamification felt more confident in their understanding of the language. This positive impact on learning Arabic grammar motivated them to engage in language tasks and adapt their learning strategies according to the language context or when necessary.

Recommendations

The researchers recommend that official authorities responsible for teaching Arabic to non-native speakers incorporate gamification into the educational curricula, using interactive platforms such as Kahoot, which are both interesting and enjoyable for students. However, the researchers emphasize that caution should be exercised when selecting gamification platforms, and that only those that have proven to be effective and have led to positive results in achieving learning objectives should be chosen.

Additionally, the researchers suggest further quasi-experimental studies to investigate the impact of gamification on other aspects of language learning, such as morphology, rhetoric, literature, and texts. They also suggest conducting quasi-experimental studies on other gamification platforms to determine their usefulness in language learning for learners and teachers.

The present study focuses on the Arabic language, and this type of applied language study may differ from other studies of the Arabic language. The gamification approach could provide helpful resources to assist language learners in understanding the language more easily. It also motivated struggling learners to become high achievers. Based on the findings of the present study, one of the benefits of gamification for language learners is their ability to comprehend grammar lessons better and improve their problem-solving skills during the learning process.

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