

# THE EFFECT OF GAMIFICATION ON LEARNING AND MEMORIZATION OF ENGLISH LANGUAGE CONCEPTS IN 8TH GRADE FEMALE STUDENTS OF RUMESHKAN CITY

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## Abstract

The present study was conducted with the aim of investigating the effect of gamification on the learning and memorization of the English lesson of eighth grade female students in Rumeshgan. The research method is quasi-experimental and the research approach is pre-test-post-test with a control group. Thirty of them were selected as available samples and randomly divided into two groups of 15 people, control and test. Students in the experimental group were given gamification-based training for 8 sessions, while in the control group; the training method was the usual way. To collect the data, a learning and memorization test made by the researcher and with the opinion of the professors and experts of the English language course was used. The validity and reliability of this test was confirmed by course instructors and experts in the field of education. To calculate the reliability of the test, Coder Richardson 20 method was used, and its value was reported as 0.84. Paired t and independent t tests were used to analyze the data. The findings of the research indicate that education using gamification had positive effect on students' learning and memory ( $p < 0.000$ ). According to the results of the research, it is suggested that the principles of gamification be used in the teaching of English language concepts.

**Keywords:** Gamification, Learning, Memorization, English Language Teaching, Concepts.

## 1. INTRODUCTION

An important role of education is to develop people's academic and social skills, goals that are difficult to achieve with traditional methods. It should be accepted that in the traditional approach of education, the focus is always on short-term goals, which are generally forgotten after they are achieved.

Therefore, the basis of new educational approaches should be a long-term and forward-looking view so that the development of social skills, attitude and learning also increases (Kepp, 2012). Studies have shown that the use of non-traditional teaching methods due to the use of technology can increase the rate of people's involvement in the learning process; Although the presence of technology is not a neutral phenomenon in the education process, the influence of learning environment design methods for its effectiveness should not be neglected (Tsai, Kafinas & Leo, 2018). Among the methods that teachers can use to make the classroom more active and attractive is the use of gamification. Gamification is a strategy to increase interaction and combine game elements in an educational environment, meaning that its main goal is to

strengthen predetermined abilities, introduce goals that give purpose to learning, engage students, provide optimal learning, support behavioral and social change. Is becoming (Smidrel et al., 2020). It should be noted that basically, games have existed in human culture for a long time and have a great impact on social life and leisure time (Boz Kurt & Dorak, 2018). herefore, gamification is a strategic effort to strengthen the services of organizations and activities by creating experiences similar to reality in the form of games with the aim of motivating and engaging users (Hamari, 2019). Relying on the induction of effects that game elements can create, many researchers have focused on the effect of gamification in the educational field and obtaining desirable results such as increasing interaction, user retention, knowledge and collaboration, learning and memory.

Equipping an educational program with game elements, such as points, badges, or progress bars, can increase transparency and competition in an educational goal or similar matters and thus have benefits similar to those of real games (Cordas & Ponce, 2023). Some authors have tried to explain the relationship between gamification and learning and memorization by presenting frameworks such as gamified learning theory (Landers, 2014). This theory defines four components: educational content, behaviors and attitudes, game characteristics and learning outcomes. Learning can be briefly defined as a predominantly positive change in the individual in the cognitive, affective and psychomotor domains, because once a person learns a certain subject, they are expected to think in a different way from then on. And behave slowly and maintain their values (Bander, 2023). Learning is a continuous set of attitudes/moods and actions of individuals and groups that are used to maintain new/new, ambiguous and repetitive events (Dulak-Arnold et al., 2021).

With this definition of learning, gamified learning theory believes that educational content directly affects learning outcomes as well as learner behavior. Because gamification is typically not used to replace education, but rather to enhance it, effective educational content is a prerequisite for successful gamification (Landers, 2014). Gamified learning theory suggests a positive and indirect effect of gamification on learning outcomes. However, it should be noted that this theory does not provide any information about the effective learning mechanisms created by game design elements (Siller & Hamner, 2020). García and colleagues point out that learning is usually more about passing exams than long-term learning, and this stimulates extrinsic motivation instead of intrinsic motivation (Garcia, 2019). Gamification seeks active learning and increasing internal motivation (Golfman & Wool, 2022).

Therefore, if we have already concluded that gamification is a technique that can support us in our learning goals, we need to think carefully about how to recognize and implement it (Rincón Flores et al., 2023). In addition to learning, memorization is also an important factor in measuring the effectiveness of educational methods, including gamification. Remembering means recalling and recalling information learned during the learning process that is stored in long-term memory. In other words, memory is the memory that is based on two parts of short-term memory and long-term memory. Which often refers to long-term memory (Oxmedona et al., 2019). With the help of memory, we know who we are and how we interact with our environment. In humans, the part of the brain that appears to be most important for memory is

the medial temporal lobe and specifically the hippocampus, and the unit of memory created is known as a memory engram (Tongawa et al., 2015). According to reports, gamification has improved the learning level of learners' memory (Q, 2022). In another study, the use of a gamification approach based on the Pok'emon game stimulated the memory and recall of students during the intervention (Rodrigues et al., 2022). However, some studies have also shown uncertain or contradictory results of gamification (Christie & Fox, 2014). They found that the ratings resulting from gamification affect learners in different ways and may lead to conflicting and unexpected effects. The Hanus and Fox (2015) study showed that gamification, in addition to reducing learning outcomes, may also reduce the enjoyment and motivation of learning. Which elements or combinations of them are effective for promoting memory and learning for an inclusive group needs further discussion and investigation. On the other hand, the importance of gamification of English lessons can undoubtedly increase students' motivation towards other educational fields and even social skills.

However, it should be noted that learning English language is always associated with stress and fear, especially in less developed areas. The use of gamification methods, especially for teenagers, can be important in reducing issues such as stress and anxiety caused by encountering the English language. Another point about the importance of conducting such researches is that despite conducting extensive studies on the application of gamification in the educational system and students' learning, it is concluded that this issue has been less addressed in Iran and it is necessary to conduct more studies. It achieved a regular framework and structure in the field of application of these new methods in the education system, especially in the study area of Rumeshgan schools. It is clear that the requirement of implementing new methods such as gamification is first to fully describe it in the form of research and academic studies, so that its components and obvious and hidden angles can be identified and finally the feasibility of implementing this educational method in the education system of the country and Provide schools. Therefore, the purpose of this research was to investigate the effect of gamification on learning and memorizing English language concepts in eighth grade female students of Rumeshkan city.

## **2. RESEARCH METHOD**

### **2.1. Research method, population and statistical sample**

The current research method is semi-experimental (experimental-field) with a pre-test-post-test design and a control group. The statistical population of this research includes 380 female students of eighth grade in Rumeshkan. In order to select the sample, a school was used where eighth grade girls had the lowest score in English. And then they were selected based on the inclusion and exclusion criteria. According to the type of research, 30 students were selected as the sample group and randomly divided into two groups (15 people in the control group) and (15 people in the experimental group). Before carrying out the process of sampling and intervention and presenting the questionnaire, the necessary permissions to obtain the consent of the students and also the necessary permission to conduct the research were prepared and obtained from the relevant bodies.

The criteria for entering the research include 1. Eighth grade students must be girls 2. Not participating in another research program 3. Having a week score in the English course. The criteria for excluding from the research are: 1. The student's unwillingness to continue participating in the research program and 2. Absence of more than one session in the training sessions.

## **2.2 Research tool**

### **2.2.1 Gamification protocol**

In this study, the students were exposed to English language gamification training group for 8 sessions, while the training method in the control group continued in the traditional way. Due to the use of English language gamification for mobile phones, permission was obtained to use mobile phones during class hours. The students were required to study the subject and at the beginning of the class they competed with each other using mobile phones. The teacher had the role of guiding the students and answered the students' problems and showed the results on the classroom TV. At the end of the competition, the teacher explained the concepts of gamification. After familiarizing the students with vocabulary and concepts through gamification, the ground for appropriate discussion was provided.

This model and study model was designed and launched based on the framework provided by Hanike et al. (2004). According to the mentioned framework, gamification has elements of mechanics, dynamics and emotions. It should be noted that the gamification of the English language lesson was designed and launched on the mobile phone platform and through the software. Registration is the first step for every student to enter the game environment. In this program, as soon as the user enters the main page, he sees flash cards. Each lock is assigned to a question, which is unlocked as soon as the question is answered, and the prize is determined in the form of virtual coins. In the top section, according to the answers to the correct questions, the students' names and scores are displayed. It should be noted that this game is online and the performance of students is provided automatically by the system. Images of the program environment are shown.

### **2.2.2 English language learning and memorization test**

This test contains 20 questions in the context of the eighth grade English course, which was prepared and compiled with the opinion of English language experts and teachers, and each set of questions examines the students' learning and memorization skills.

### **2.2.3 Validity and reliability of data analysis tools and methods**

Criteria such as appropriateness of questions, appearance and images used and their comprehensibility for students in the present study were among the face validity factors of the learning and memorization test. In order to determine the validity of the content, the objectives and headings determined by the Ministry of Education in relation to the eighth grade English course were examined. Then the questions of the tests were analyzed so that they were extracted based on the objectives of the lesson, then the ratio of the questions assigned to each part of the book in each test was examined and after some corrections, the validity of the form and

content was confirmed. To calculate the reliability of the test, Coder Richardson 20 method was used, and its value was reported as 0.84. 22SPSS software version 22 was used for data analysis. The tests used to explain the relationship between components are used in 2 parts of descriptive statistics such as mean, standard deviation and frequency and inferential statistics such as T-test to compare averages.

### 3. FINDING

The Kolmogorov-Smirnov test was used to check the normality of the data, and the results are shown in Table (1).

**Table 1: Kolmogorov Smirnov test**

significance level	statistics	number	groups	Variables	
0.507	0,823	15	experimental	Pre-test	learning
0.372	0.915	15	control		
0.962	0.504	15	experimental	Post-test	
0.718	0.696	15	control		
0.142	0.750	15	experimental	Pre-test	memorization
0.919	0.554	15	control		
0.901	0.571	15	experimental	Post test	
0.874	0.592	15	control		

Parametric statistical tests, paired t and independent t, were used in the inferential statistics section to check the research hypotheses .

**Table 2: Independent t-test for learning and memory post-test**

Hypothesis results	Significance level	statistics t	mean difference	mean	Freedom level	group	Component
confirm	0.000	57.17	2.16	2.59	14	control	learning
				4.43		experimental	
confirm	0.000	36.94	2.533	2.184	28	control	memorization
				4.717		experimental	

According to table (2), it can be concluded that the observed difference between the average learning in the two experimental and control groups is statistically significant. Considering (t=57.17) and significance level (P=0.001) obtained, it can be concluded that gamification is effective on the learning rate of eighth grade students in Rumeshgan. In the memorization component, the average memorization in both experimental and control groups is statistically significant. Taking into account (t=36.94) and the significance level (P=0.000) obtained, it can be concluded that gamification is effective on the memory of female students of Rumeshgan. The results of the paired t test for the learning and memory test group are presented in Table (3).

**Table 3: Examining the learning and memorization of the groups with the paired t test**

Hypothesis results	Significance level	statistic t	mean	Freedom level	variable	group	
confirm	0.000	24.37	2.00	14	learning	Pre-test	experimental
			4.43			Post-test	
confirm	0.000	36.94	2.18	14	memorization	Pre-test	experimental
			4.42			Post-test	

According to table (3), it can be concluded that the observed difference between the average learning in the experimental group (pre-test and post-test) is statistically significant. Taking into account ( $t=24.37$ ) and the amount of error (individual differences) in the learning variable, the significance level ( $P=0.000$ ) obtained is smaller than the error of 0.05, so it can be said that gamification affects the learning of female students in Rumeshgan. It is effective. The observed difference between the average recall in the experimental group (pre-test and post-test) is statistically significant. Therefore, taking into account ( $t=36.94$ ) and the significance level ( $P=0.000$ ) obtained, it can be said that gameification is effective on the memory of female students of Rumeshgan.

#### 4. DISCUSSION

The purpose of this research was to investigate the effect of games on learning and memorization of English lessons among eighth grade female students in Rumeshgan. The findings of the present study showed that in the learning variable, the difference in average scores between the experimental and control groups is significant ( $p=0.000$ ). In the next step, the difference in the average scores in the post-test phase (4.71) compared to the pre-test (2.71) led to the conclusion that the gamification method is effective in increasing students' learning. This result of the research with the results of the studies of Wolbers et al., 2019, Danlusky et al., 2013; Haidth et al., 2016, Papadakis & Kalogianakis, 2019, Marti Parno et al., 2021 are consistent.

A significant difference between the experimental and control groups can be seen in the average scores of the memorization variable ( $p=0.000$ ). Another thing is that according to the difference in the average scores in the post-test phase (4.42) compared to the pre-test (2.18), it can be concluded that the gamification method is effective in increasing memory. This result of the present research is consistent with the results of the studies of Q (2022), Rodriguez et al., 2022, Cardoso et al., 2017, and Eagleman and Brandt (2017). In the review of similar studies, similar and consistent reports can be used, although some studies also reported non-aligned results.

In one of the same type of studies, it is stated that gamification improves the learning level of male and female students, which is consistent with our study (Wolborz et al., 2019). In this study, it has been shown that, due to the greater participation of male students in the gamification process, the average learning scores of male students were higher compared to girls. In explaining and comparing the results, it should be mentioned that in the present study only the effect of gamification on the learning of female students was investigated and the effect of the demographic component of gender was not investigated.



Other related studies have reported that holding games sessions in multiple short time frames, have better effectiveness in students' learning compared to long-term sessions, which can be important and be placed on the agenda of administrators and teachers (Danluski). et al., 2013; Heidth et al., 2016). One of the important effects of using gamification in the learning process is to increase the emotional element, so that most studies in this field emphasize the effect of gamification on the emotional element of learning (Papadakis and Kalogianakis, 2019). The emotional domain of learning actually refers to the way a person emotionally deals with an approach, for example, intrinsic and extrinsic motivation, passion, pleasure, satisfaction, interest and innovation are all part of the emotional attitude of a person or student in a method such as gamification.

The factors that increase emotional learning in students are the variables of enthusiasm and intrinsic motivation. It originates during the game. Therefore, it can be argued that all the emotional components of learning are related to each other so that during the game process, students learn how to do difficult tasks, develop their informational knowledge and acquire the necessary skills They develop success aligned with educational goals (Huang and Hue, 2018; Lubersheimer et al., 2016). Several studies have pointed out the benefits of using digital games in various research fields, such as the study conducted by Jamaluddin et al. (2021).

This research showed that gamification has a positive effect on maintaining the stability of teaching and learning of students, which was consistent with the results of the current research. It is important to mention that one of the main goals of implementing various gamification-based learning methods and strategies is to change students' behavior. In support of this claim, a study showed that one of the effects of using gamification is to increase learning results in a form of changing behavioral attitudes corresponding to the psychomotor domain in Bloom's classification. Therefore, it can be argued that the effect of using gamification on behavior change, including teamwork, communication skills, social skills and digital literacy is evident (Khawaja and Salim, 2019).

In the other part of the results of this study, the effectiveness of the gamification method on the memorization of the English lesson of female students was obtained. In the review of various studies, it was observed that most of the studies confirm that gamification is a useful method for memorizing and improving the memory level of students in remembering words and exercises in English lessons. In this context, Q's study (2022) indicates that the effect of gamification improved the memorization scores of the learners' English course, while no difference was observed between the scores of the learners' learning section. In another study, using the gamification approach based on Pok'emon game stimulated the memory and recall of students during the intervention, which was in line with the results of the present study (Rodrigues et al., 2022). In their study, they argued that the effectiveness of Pokémon game elements was due to their connection to people's emotional memory, supporting their related needs, and making learners curious. Of course, they have mentioned the confusion of students and creating anxiety as a result of competing with other students as possible side effects of gamification, which requires more attention and study.

However, in general, emotional memory is one of the important dimensions of memory that ultimately affects the effectiveness of the gamification program due to its close connection with the user experience (Cardoso et al., 2017). Therefore, gamification by influencing learning and memory through the exploitation of visual aesthetics that is linked to the emotional memory of learners seems to have the potential to maximize memory efficiency by increasing interaction with other students or recalling the user's previous experience. The study of Eagleman and Brandt (2017) showed that creativity, learning, and innovation are part of the neuronization of the human brain, so that the neural key of the learning system is the distance between sensory inputs and motor outputs in the brain, which proved the claims of previous studies.

In other words, humans create their learning experiences in the form of receiving visual-perceptual information, storing it (memory), and finally manipulating that information (creativity). In addition, some other findings show that gamification has an effect on students' intrinsic motivation. According to the self-determination theory, intrinsic motivation includes an internal stimulus related to curiosity and also depends on basic psychological needs such as communication and interaction (Ryan and Desi 2017).

In general, it seems that the development of learning and memorization of students' lessons based on gamification is an approach that has come from the heart of technology development and has provided a good opportunity to change the traditional education method. However, it should be noted that the implementation of the gamification method in English lessons may sometimes be associated with positive and negative challenges.

The first point is that learning based on gamification requires the overall participation of students and makes them more enthusiastic towards better education, and this is one of the goals of educational centers and schools. The second point is one of the main goals of gamification design is to reduce the feeling of fatigue in students, which is important in both learning and memorization. Finally, in order to implement the gamification technique in schools as best as possible, it is recommended to first prepare courses and workshops for school teachers, during which, the basic principles and framework regarding gamification and their correct use in appropriate situations and conditions Explain to teachers.

In addition, along with the role and duty of the teacher, high-level executives in ministry of education should also make their educational programs game-oriented and use capable designers and expert consultants to achieve this. In order to make the game more effective on students' memorization, it is suggested to use memory games that include repeating patterns and memorizing them.

The use of various images and shapes has a great impact on improving the memorization level of students. In line with the limitations of the present study, it should be noted that the generalizability of its results is limited; it is obvious that the use of group research designs instead of single subject studies will greatly help to improve the external validity of the research. The subjects of the present study were trained in gamification of English language lessons for 8 sessions.



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