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Investigation the Effect of Gamification on English Learning, Recall and Motivation: Digital or Face-to-face, which is more effective?

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ABSTRACT

Purpose: The present study aimed to compare the effects of digital and face-to-face gamification on learning, recall, and motivation of English vocabulary.

Method: We used the experimental method with a pre-test and post-test design. The statistical population of this research included all 7th-grade students in Heris City. The sample of the study were selected as available samples and after the pre-test were randomly assigned into two experimental groups (N:52): the first group used the digital form and the second group used the face-to-face form. The research tool was the researcher-made learning and recall test, as well as Keller's educational achievement motivation questionnaire.

Finding: The results of covariance and independent t-test indicated that there is no significant difference in the amount of learning and also there is no significant difference between the average scores of students in the recall test in the experimental groups (t= 0.93, sig= 0.44). On the other hand, the results show a significant difference in the motivation test of the groups (t=2.64, sig=0.01). The students in the digital gamification group experienced more motivation during the experiment.

Conclusion: Although the result of this research shows the lack of a significant effect of the gamification on learning in both face-to-face and digital forms, the results indicated that applying game-based learning in the digital form increased motivation. The different effects of Game-based instruction of the two groups on motivation and basically the effect of the game on learning and the positive self-concept of learning is a valuable and practical finding. ©**authors**

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1. Introduction

Foreign language learning is becoming more popular due to technology breaking down geographical barriers and allowing access to information and people from distant places. (Rego, 2015). Teaching a foreign language has its own methods and techniques. Successful foreign language teaching requires specific goals, methods, and techniques (Ocak, Kuru & Özçalışan, 2010). Language learners usually point out that learning and memorizing English vocabulary and the correct form of verbs are boring activities (Dehghanzadeh et al. 2019). Language learning should be more fun and enjoyable for students to learn (Amjah, 2014). Since students are exposed to additional information every day, it becomes more challenging to sit through the entire course and focus on the teacher's lectures. This educational process has become boring for new generations, one of the methods that may help this situation is gamification (Aleksić-Maslać, Rašić & Vranešić, 2018). In this regard, Kingsley & Grabner-Hagen (2018) stated that gamifying vocabulary learning can spark students' interest and excitement about learning words in a playful context. Gamification has become a prominent technological advancement for human participation (Majuri, Koivisto & Hamari, 2018). In this regard, van Roy, Deterding & Zaman (2018) stated that in recent years, the use of game design elements or gamification in education has flourished and it is currently considered as one of the most useful and implementable resources in modern education (Ouariachi & Elving, 2020). Differentiating game is one of the methods that forces students to actively participate in class and learn through playing with their peers and make learning fun by emphasizing positive competition (Aleksich- Maslage et al., 2018). Game-based learning or gamification depends on the experiential nature of a game that allows learners to fully participate in the learning cycle (Tan Ai Lin, Ganapathy & Kaur, 2018).

Motivation is one of the most acclaimed benefits of gamified methodologies (Ruiz-Bañuls et al., 2021). Scientific literature suggests that gamified environments for learning English could increase learners' motivation (Hanus & Fox, 2015). What makes motivational information systems such as gamification interesting is the fact that the systems at their core motivate and support the user toward a given activity or behavior. This conveys that the system should increase efficiency and productivity regarding the target behavior. Thus, their usefulness is determined on the basis of whether they manage to do so (Koivisto & Hamari 2019). By applying gamification to the classroom, students could be motivated to learn in new ways or enjoy otherwise tedious tasks (Hanus & Fox 2015). Therefore, teaching methods and strategies should be designed in such a way as to consider learner's experiences and increase their motivation and interest to meet the need of ever-increasing number of learners who are busy with learning English (Arndt & Woore, 2018). The present study aims to explore how various game designs affect motivation, learning, and recall in face-to-face and digital format.

2. Literature Review

Gamification as a term originated from the digital media industry (Deterding et al., 2011). According to Iosup & Epema (2014), gamification may have originated in the Early-Communist thought and matured in the Soviet era, as a substitute for monetary incentives to perform at work, and saw a reemergence in the U.S. in the early 1980s. Werbach and Hunter (2012) stated that gamified systems were mentioned in the early 1980s. They also stated that the first use of gamification in its current sense apparently happened in 2003; but Deterding et al. (2011) wrote that the first documented date back to 2008. However, in 2010 the term gamification was widely accepted in the sense that people are now using it (Deterding et al., 2011; Werbach and Hunter, 2012). However, Werbach and Hunter (2012) have mentioned that there is no universal definition for gamification. Zichermann & Cunningham (2011) stated that gamification can mean different things to different people. Some consider it to be an explicit game to promote products or services. Others think of it as creating virtual 3D

worlds that change behavior or provide a way to train users in complex systems. Kapp (2012) defines gamification as "the application of foundational game mechanisms, aesthetics, and game thinking in order to engage people, motivate action, increase learning, and solve problems." After the comprehensive research of Deterding et al., (2011) proposed a different definition and differentiation of gamification in a wide field of serious games and design for interactive games; They have defined gamification as "the use of game design elements in non-game contexts with the aim of motivating, increasing, and maintaining user activity". Verbach (2014) states that, certainly, defining gamification in certain ways does not necessarily change the ways. The correct understanding of gamification is ultimately what exists in the world.

The concept of gamification is very close to games (kapp, 2012). Deterding et al. (2011) separate gamification (including parts of games) from games (including all games). In this regard, Verbach (2014) stated that it is difficult to separate gamification from the game. In some ways these interactive learning events are similar. When they are well designed, they involve the learner and have a significant impact on the individual and the organization. However, each differs in purpose, outcomes, and design (Kapp, 2012). As mentioned, gamification refers to the use of game elements in non-game situations to create enjoyable, entertaining and motivating learning experiences for learners (Deterding et al., 2011; Kapp, 2012; Werbach, 2014 and Werbach and Hunter, 2015). Kapp (2012) defined games as follows; A system in which players engage in an abstract challenge, defined by rules, interaction, and feedback, leading to a quantitative outcome that often elicits an emotional response. Also, Verbach (2014) states that definitely, the question of what is a game? It has confused game designers, theorists and even philosophers. But Calderón, Boubeta-Puig & Ruiz, (2018) have stated that gamification is not creating a full-fledged game, but rather involves using lessons from the game field to increase commitment and motivation in non-game situations.

One of the most important frameworks designed for game design is MDA (Werbach and Hunter, 2012; Hamzah et al. 2015; Ruhi, 2015; Kusuma et al. 2018). This framework stands for Mechanics, Dynamics and Aesthetics.

Mechanics; According to Ruhi (2015) described the rules and specific components of the game in terms of the functions that the players can perform. Processes that guide user actions. In this regard, Hamzeh et al. (2015) have stated that mechanics are related to games that describe the specific implementation of the game at the level of displaying data and algorithms. According to Grünberg, "game mechanics are the agents, objects, elements, and their relationships in the game (Urh et al, 2015, pp3). They define a game as a rule-based system, specifying what exists, how things behave, and how players can interact with the game world. Also, according to Zichermann & Cunningham (2011) mechanics constitute the functional components of the game. It allows the designer to have ultimate control over the levers of the game and gives him the ability to direct the player's reactions. Verbach and Hunter (2012), the mechanics they have identified are; challenges, luck, competition, cooperation, feedback, rewards, trades (trade between players), turns and win states.

Dynamics; According to Ruhi (2015) dynamics describes how rules unfold during actual gameplay (run time) based on players' input to the system as well as interactions between players. Hamzah et al. (2015), in this regard, have stated that dynamics is about the behavior of runtime mechanics that acts on player inputs and other outputs over time. Also, Zichermann, G., & Cunningham (2011) have mentioned that the dynamics are the player's interactions with the mechanics. They determine what each player will do in response to system mechanics, either individually or with other players. The most important dynamics of the game according to Werbach and Hunter (2012), are; Limitations, emotions, narrative, progress and relationships.

Aesthetics; In this regard, Ruhi (2015) has stated that aesthetics describes the desired emotional responses that are evoked when users interact with the gaming system. Also, Hamzah et al. (2015) mentioned that aesthetics describes the desired emotional response of

the player when the player interacts with the game system. Werbach and Hunter (2012) the most important aesthetics (in their book, the term "elements" is used instead of aesthetics), are; achievements, avatars, badges, campaigns, giving gifts, etc. In picture number one, you can see the MDA framework taken from Ruhi (2015).
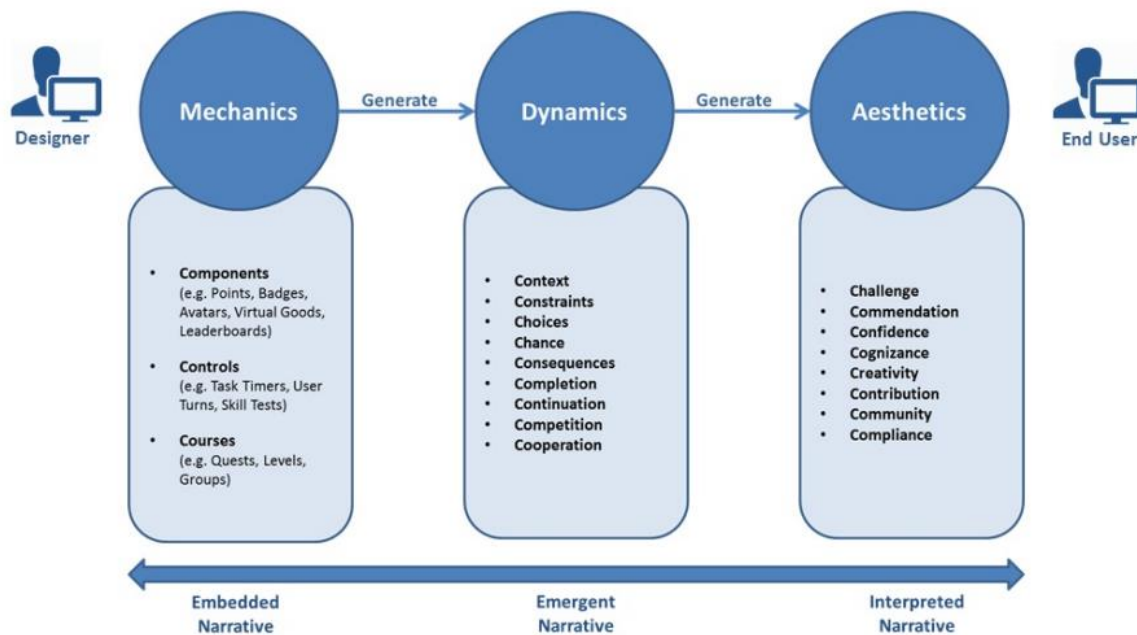

Figure 1: related to the MDA framework taken from Ruhi (2015)

The designer creates the functions and features (mechanics) of the game, which create different types of interaction between the system and the user (dynamics) that lead to specific emotions and experiences of the end user (aesthetics). Therefore, the designer's point of view links mechanics to dynamics and subsequently to aesthetics (Ruhi, 2015). Putting all these elements together is the main task of gamification design and having knowledge about these game elements will make your gamification project attractive. Remember that no gamification project includes all of these elements. In fact, it is unlikely that you will use all of the items in each statement (Werbach & Hunter, 2012). In this regard, Kalmpourtzis (2018) has also stated that the use of any gamification tool without proper integration and connection with the learning aspect will most likely not be attractive to your audience. Also, Kapp (2012) has stated that, like any learning intervention, gamification is not an answer for every learning situation, and it is not logical to use it for all learning materials or experiences.

Gamification has been applied in various fields in recent years (Urh et al., 2015). Gartner (2011) also predict that most companies and organizations will implement gamification in the near future. This has led to gamification being implemented in domains such as enterprise resource planning (Alcivar & Abad, 2016; Herzig, Strahringer, & Ameling, 2012), health (Howard, Win & Guan, 2023; Baranyi et al., 2023; White, Martin & White, 2022; Arruzza & Chau 2021), exercise (Hamari & Koivisto, 2015; Koivisto & Hamari, 2014), industry (Korn & Schmidt, 2015; Paravizo et al., 2018) education (Dicheva et al., 2015; Dehghanzadeh et al., 2019; Yazdi & Hatami, 2023; Hanus & Fox, 2015; Waluyo & Bucol, 2021; Ruiz-Bañuls et al., 2021; Majuri et al., 2018; Filsecker & Hickey, 2014). Kapp (2012) stated that; in the field of education, gamification has been successful and has been successful in a wide range of subjects and age groups, from elementary and high school students to university level courses. In this regard, Caponetto, Earp & Ott (2014) have stated that one of the fields in which gamification can be used is education. The purpose of gamification is to create and transform experiences in order to convey emotions and interaction similar to playing games, which is not entertainment (Al-Hamad and Moreno, 2018).

Previous research has shown that gamification had a positive effect on motivating learning, improving learning performance, and enhancing overall competence. Timely feedback was often provided in games to inform learners that they were making progress. Generally, students were motivated to improve, and engaged through rewards such as tangible material rewards and intangible feelings of victory (Bodnar et al., 2016). In addition, gamification had a positive impact on students' academic performance and self-efficacy (Wang & Zheng, 2020). gamification makes learning fun through friendly competitions, challenges, and rewards, making it an excellent means of encouraging students' engagement in learning (Hamari et al., 2016). It helps a learner to develop critical thinking and multi-tasking skills (Ding, Er, & Orey, 2018). Gamification exerts, in general, a positive effect on students' engagement, motivation and satisfaction (Zainuddin et al., 2020). Ruiz-Bañuls et al., (2021), state that gamified proposals in primary school classes, unprecedentedly intertwined with the benefits provided by interdisciplinary work and transmedia narratives, notably improves the students' training process and their motivation, while also contributing to the better acquisition of compulsory curricular contents and enhanced academic performance. Gamification also motivated learners to engage in scientific inquiry activities (Tsai et al., 2020).

On the contrary, there are some empirical studies that conclude that gamification exerts no effect on aimed variables (Donnermann et al., 2021). As an example Khandelwal et al. (2017) after comparing gamified and non-gamified groups, concluded that despite most of the students being in favor of gamification, there was no impact of gamification on students' performance. Similarly, Jesus et al. (2020) stated that there was no difference in performance between gamified and non-gamified groups, and non-gamified groups were more engaged despite the fact that gamification attracted more students' attention.

So far, a lot of research has been done in the field of gamification in digital or face-to- face form: Blanco et al., (2023), Broza et al., (2023), Mohammadi, Khoshneshin & Mohammadhasani, (2022), Sadeghi et al., (2022), Purgina et al., (2020), Dehghanzadeh et al., (2019), Kusuma et al., (2018), Rawendy et al., (2017), Kétyi (2016), Flores (2015), Rego (2015), which with similar findings, have emphasized the potential of the mentioned methods for learning. However, studies that specifically use gamification in both formats are not that common. The purpose of this research is to compensate a part of this gap. Deterding et al., (2011) stated although most current examples of gamification are digital, limiting it to digital technology would be an unnecessary.

The present study seeks to examine goals with three hypotheses:

1. There is no significant difference in the amount of learning between the group of face-to-face gamification and digital gamification.

2. There is no significant difference between the group of face-to-face gamification and digital gamification in the amount of recall.

3. There is no significant difference in the level of motivation between the group of face-to-face gamification and digital gamification.

3. Method

The present study was conducted with the aim to compare the effect of gamification on learning, recall and motivation of English words in a digital and face-to-face format.

Therefore, this research is a functional research in terms of its purpose, as well as in terms of controlling variables, collecting data and information and the method and analyzing is an experimental research. The research design of this study is a pre-test-post-test design. The statistical population of this research included all the students of the seventh grade (first secondary school) of Heris city (Khaja district) of East Azarbaijan province, and Shahid Jafari Bilvardi and Shahid Mahdian Jighah schools were selected as available samples, and the classes were randomly selected from among the mentioned schools as research samples. Seventh grade students were selected as research sample. The research tools are as follows:

1. The pre-test, post-test, and recall tests including 20 multiple-choice questions from the English vocabulary section, whose types of questions were different, were designed and implemented. The validity of all three tests was confirmed by a group of faculty members of Kharazmi University and 7 experienced teachers. The reliability of each was calculated using the Coder-Richardson method, which was obtained for the learning pre-test (0.80), the learning post-test (0.85) and the recall test (0.87).

2. Keller (1993) Academic Achievement Motivation Questionnaire: In this research, Keller's Achievement Motivation Test was used in pre-test and post-test to measure academic achievement motivation. This questionnaire has 34 items and the way of scoring the test is that the options are assigned a score of 5 to 1 or 1 to 5 according to the motivation to progress from high to low or from low to high. High scores in this scale indicate high achievement motivation and low scores indicate low achievement motivation.

3. Games made by the researcher for two experimental groups in the English language course, which are described below:

• The first experimental group: including students who were trained with educational games (face-to-face). In this group, the environment has been gamified by combining educational content and game elements (such as competition, challenges, bulletin boards, points system, etc.).

• The second group: includes students who were trained using gamification (digital version). In this group, like the first group, educational content is combined with game elements (such as competition, challenges, bulletin boards, points system, etc.).

The story of the game is that one of the best friends of the students has been kidnapped and imprisoned in a place by unknown people. In order for the students to save their friend, they must find the code of the door of that place, which is in Latin letters, and save their friend. The game is designed for two groups exactly the same, the only difference is in the way it is executed, for one group face to face and for the other group digital. The elements of the game include: game levels (the game levels become harder as the students progress), points (in each stage of the game, students are given points based on their performance in playing the game, which is given in the form of stars, with three stars for completing the stage perfectly, which gives five points, and two or one star depending on how incomplete they complete the stage), ranking table (this element shows the position of the student compared to other students), feedback (in the initial stages of the game, feedback is provided for the smallest performance of the students, and as the students pass more stages, feedback is provided more generally), rewards (whenever a student completes three stages perfectly, i.e. with three stars, they earn a gold coin, if they complete two stages perfectly, they earn a silver coin, these coins are used when decoding in this way: to show one of the letters, the student must have a gold coin and two silver coins), time pressure (after the student becomes familiar with the target vocabulary in the early stages of the game, this element is used in the middle stages), medal (the first student receives a gold medal, the second receives a silver medal, and the third receives a bronze medal).

The game is executed in four main forms, as explained below.

Students must find and mark the specified word in the table (Figure 2-A).

Students guide the word and shape by dragging and dropping the word or shape from the bottom to the desired word or shape in the top section (Figure 2-B).

Using the letters they have, students identify misplaced words and place them in the correct position (Figure 2-C).

Students must write the correct shape of the word (Figure 2-D).

In the early stages of the game, fewer vocabulary words are used so that students can focus more on learning the vocabulary. Additionally, if the game is played correctly, the pronunciation of the target word is provided through the digital system or spoken by the teacher or coach in a face-to-face setting, allowing students to better learn the desired word.
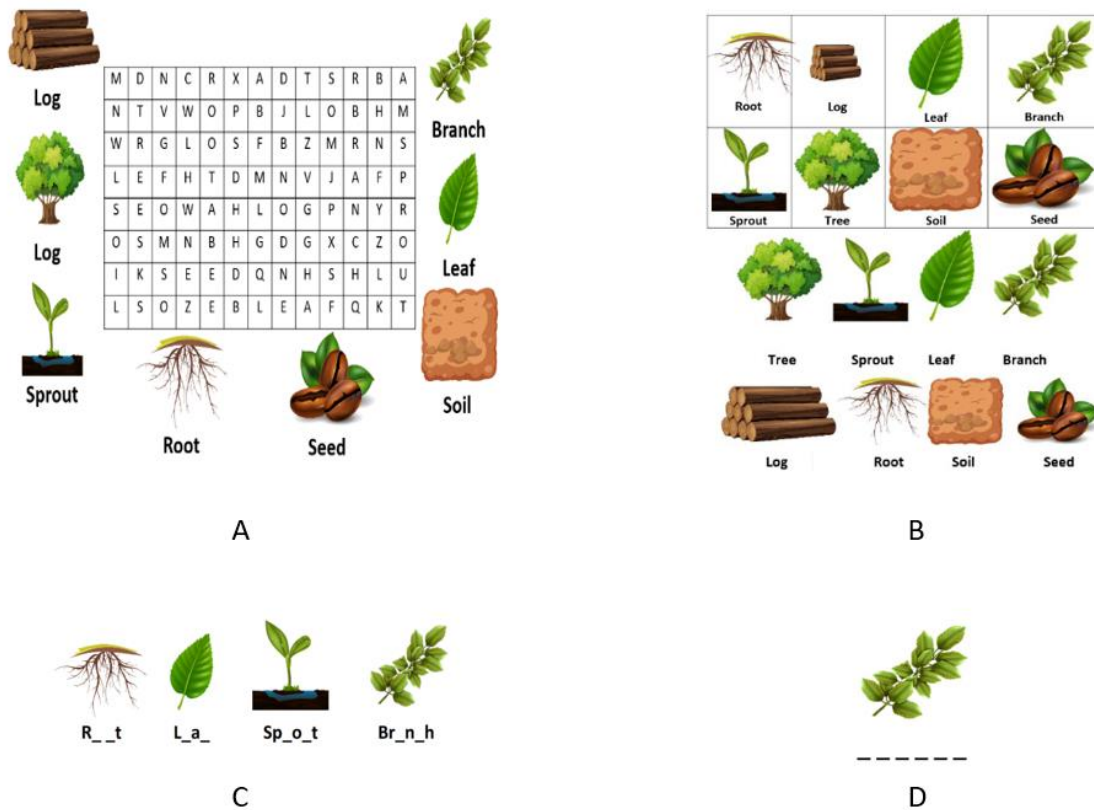

Figure 2. An image of the program environment

4. Findings

After collecting pre-test and post-test data of learning, recall test and motivation test, the resulting data were analyzed in two descriptive and inferential sections. Table 1 shows the number of participants in each of these tests.

Table 1. Description of the statistical sample of the research

groups	Learning pre-test	Learning post-test	Recall test	motivational test
Digital gamification group	26	26	26	26
Face-to-face gamification group	26	26	26	26

Table 2 summarizes the descriptive indices (lowest and highest score, average and standard deviation) related to each of these tests.

Table 2. Description of the statistical sample of the research

		Digital gamification group	Face-to-face gamification group
Learning pre-test	the least	04/00	03/00
	the most	07/00	08/00
	Average	05/61	05/30
	The standard deviation	00/96	01/18
Learning post-test	the least	11/00	13/00

	the most	18/00	17/00
	Average	15/23	15/84
	The standard deviation	01/16	00/80
Recall test	the least	12/00	13/00
	the most	17/00	18/00
	Average	14/69	15/15
	The standard deviation	01/31	01/21
Motivational test	the least	100/00	98/00
	the most	128/00	120/00
	Average	118/38	111/84
	The standard deviation	06/99	05/50

As Table 2 shows, the average pre-test scores of students in the digital gamification group (5.61) and the face-to-face gamification group (5.30) are slightly different. Despite the small difference between these two groups in the pre-test of learning, the scores of these two groups in the post-test have grown significantly from the pre-test to the post-test of learning and this means the effectiveness of both digital gamification and face-to-face gamification methods on students' learning in learning English vocabulary. Although Table 1 shows the effectiveness of these two educational methods in students' learning, these two groups have a small difference in the post-test (about half a point). Since in this research we were also looking to compare the students' recall level, after a few days, a recall test was administered to the students, and the results show that the recall rate of students in the face-to-face gamification group (15.15) is somewhat higher than in the digital gamification group (14.69). The descriptive results of the motivation test also show the relative difference between the two groups. This means that the face-to-face gamification group (111/84) experienced less motivation during the experiment than the digital gamification group (118/38).

Although, based on these descriptive indicators, it is possible to make a general judgment about the level of learning, recall and motivation of the two groups; but in order to be able to clarify more precisely whether these changes are the result of experimental variables (digital gamification and face-to-face gamification) and not a sampling error, inferential statistics methods should be used to analyze each of the research hypotheses. For this purpose, below we have analyzed each of the assumptions with covariance test and independent t-test.

The first research hypothesis: There is no significant difference in the amount of learning between the group of face-to-face gamification and digital gamification.

To answer this question, you can compare the average obtained for both groups in the post-test and conclude which group has a higher average than the other group and whether the difference between the groups is significant or not. But since it is assumed in the present research that the pre-knowledge of the learners has an effect on the results of the post-test, the necessary data were collected through the implementation of a pre-test before the start of the experiment. Then, these data obtained from the pre-test were checked for certainty through the covariance test so that the post-test results could be analyzed more accurately. In order to perform the covariance test, you must first make sure that the variance of the groups is equal or not. In order to be able to use the parametric covariance test for data analysis, it is necessary to know the homogeneity of variances. The test that examines this is Levene's test. The results of this test are shown in Table 3.

Table 3. Homogeneity of variances test table

F	Degree of freedom 1	Degree of freedom 2	Meaningful
1/19	1	50	0/28

Considering that the obtained significance level (0.28) is greater than 0.05 (Table 3), it can be concluded that there is no fundamental difference between the variances and they are homogeneous. Therefore, the parametric covariance test can be confidently used to analyze the results related to the research hypothesis. In Table 4, you can see the average and standard deviation for the research groups.

Table 4. Descriptive indicators related to the first hypothesis

groups	Number	Average	The standard deviation
Digital gamification group	26	15/23	01/16
Face-to-face gamification group	26	15/84	00/80

You can also see the results of the covariance test in Table 5. This table shows that there is no statistical difference between the two test groups in terms of the amount of learning, and the observed difference between the post-test scores of 0.61 is due to statistical errors and other research errors.

Table 5. The results of covariance analysis for the first hypothesis

	Degrees of freedom	Average square	F index	Meaningful	Eta squared
groups	1	03/63	04/20	00/06	00/16
Pre-test	1	00/24	00/28	00/59	00/01
Regression slope	1	04/96	05/73	00/02	00/20
Error	48	19/03	-	-	-
Total	52	-	-	-	-

After adjusting the pre-test scores, there was no significant difference between these two groups (p<0.06, f=4.20, Partial Eta Squared=0.16). Also, the adjusted averages (Table 6) confirm this. Therefore, it can be said that there is no significant difference in the amount of learning between students who were educated using digital gamification and students who were educated with face-to-face gamification.

Table 6. Adjusted average for the digital gamification group and the face-to-face gamification group

groups	Adjusted average	Standard error of the average
Digital gamification group	15/31	00/26
Face-to-face gamification group	15/89	00/26

The second hypothesis of the study: There is no significant difference between the group of face-to-face gamification and digital gamification in the amount of recall. To answer this hypothesis, the average scores of the two groups of students in the recall test were compared with independent t-test. The results of this test are shown in Table 7.

Table 7. The results of the independent t-test about the second hypothesis

		Average	standard deviation	df	t	P
groups	Digital gamification	14/69	01/31	50	00/93	00/44
	Face-to-face gamification	15/15	01/21			

As can be seen from Table 7, there is no significant difference between the average scores of students in the recall test in the digital gamification and face-to-face gamification groups (t=0.93, P=0.44). Therefore, it can be said that the digital gamification method and the face-to-face gamification method have the same effect on the students' recall.

The third research hypothesis: There is no significant difference in the level of motivation between the group of face-to-face gamification and digital gamification. To answer this hypothesis, the average scores of the two groups of students in the motivation test were compared with independent t-test. The results of this test are shown in Table 8.

Table 8. The results of the independent t-test about the third hypothesis

		Average	standard deviation	df	t	P
groups	**Digital gamification**	118/38	06/99	50	02/64	00/01
	Face-to-face gamification	111/84	05/50			

As can be seen from Table 8, there is a significant difference between the average scores of students in the motivation test in the digital gamification and face-to-face gamification groups (t=2.64, P=0.01). Therefore, it can be said that the students in the digital gamification group (118/38) compared to the face-to-face gamification method (111/84) experienced more motivation during the experiment.

5. Discussion

The present research was conducted with the aim to compare the effect of gamification on learning, recall and motivation of the English words, whether it is digital or face-to-face. The results of covariance analysis and independent t-test regarding the first and second hypotheses that measure the learning and recall of the two research groups indicated that there is no significant difference between the two groups in the amount of learning and memorization. Meanwhile, the difference in scores between pre- and post-test is evident in both groups and shows the effect of gamification on students' learning and recall. Previous research studies have established that gamified vocabulary learning can significantly enhance student learning motivation and engagement which can potentially lead to better learning outcomes (e.g., Homer et al., 2018; Medina & Hurtado, 2017; Waluyo & Bucol, 2021; Hasegawa et al., 2015; BOYACI & ERSOY, 2021; Waluyo, 2020; Kétyi, 2016; Weissheimer et al., 2019). Dehghanzadeh et al. (2019) have also stated that learning vocabularies was the most commonly reported positive learning outcomes of the gamification for LESL. Almost most of the reviewed publications targeted content language learning in terms of learning vocabularies. On the contrary, Khandelwal et al., (2017), Domínguez et al., (2013), Hanus and Fox (2015), Rachels and Rockinson-Szapkiw (2018), O'Connor & Cardona (2019), Chase et al., (2021), Cowley et al., (2014), Cowley et al., (2013) Sitzmann (2011) and Albuquerque et al., (2017) after comparing gamified and non-gamified groups, concluded that there was no impact of gamification on the student performance, despite most of the students being in favor of gamification. Furthermore, it should be borne in mind that these effects may be different depending on whether the perceptions of the performer or the recipient of the service provided are analyzed (Zou, 2020). In this regard, Almeida et al., (2023) have stated that gamification, when properly applied, can have positive effects on education/learning software. Since the positive effect of gamification on students' learning was evident in this study and most of the similar studies, the effect of gamified vocabulary education cannot be denied. Therefore, it can be concluded that gamified education is considered as an effective channel for learning.

Regarding the third hypothesis, which was tested between the group of face-to-face gamification and digital gamification in the level of motivation, we came to the conclusion that the group of digital gamification had more motivation than the face-to-face group. In the research reviewed by the researcher, such a comparison (between digital and face-to-face group motivation) was not observed, but many researches (for example; Tsai, Lin & Liu, 2020; Bodnar et al., 2016; Alt, 2023; Tan, Sunar & Goh, 2023; Akpolat & Slany, 2014; Landers, 2014; Hew et al., 2016) have been conducted regarding the effectiveness of gamification on students' motivation.

6. Conclusion

The present research was conducted with the aim to compare the effect of gamification on learning, recall and motivation of the English words, whether it is digital or face-to-face. The results of covariance analysis and independent t-test regarding the first and second hypotheses that measure the learning and recall of the two research groups indicated that there is no significant difference between the two groups in the amount of learning and memorization. Meanwhile, the difference in scores between pre- and post-test is evident in both groups and shows the effect of gamification on students' learning and recall. Previous research studies have established that gamified vocabulary learning can significantly enhance student learning motivation and engagement which can potentially lead to better learning outcomes (Homer et al., 2018; Waluyo & Bucol, 2021; Hasegawa et al., 2015; Waluyo, 2020; Kétyi, 2016; Weissheimer et al., 2019). Dehghanzadeh et al. (2019) have also stated that learning vocabularies was the most commonly reported positive learning outcomes of the gamification for LESL. Almost most of the reviewed publications targeted content language learning in terms of learning vocabularies. On the contrary, Khandelwal et al., (2017), Domínguez et al., (2013), Hanus and Fox (2015), Rachels and Rockinson-Szapkiw (2018), O'Connor & Cardona (2019), Chase et al. (2021) and Albuquerque et al, (2017) after comparing gamified and non-gamified groups, concluded that there was no impact of gamification on the student performance, despite most of the students being in favor of gamification. Furthermore, it should be borne in mind that these effects may be different depending on whether the perceptions of the performer or the recipient of the service provided are analyzed (Zou, 2020). In this regard, Almeida et al. (2023) have stated that gamification, when properly applied, can have positive effects on education/learning software. Since the positive effect of gamification on students' learning was evident in this study and most of the similar studies, the effect of gamified vocabulary education cannot be denied. Therefore, it can be concluded that gamified education is considered as an effective channel for learning.

6. Conclusion

Since ancient times, all researchers and scholars were looking for effective and useful ways to transfer their knowledge and experiences to others, as well as better learning these issues to learners in all fields of science and knowledge and still with the progress of science and technology, this need is felt more and more day by day in the field of science and knowledge. One of the methods that has received more attention in the last decade is the use of gamification in most fields, especially education. The focus of this research is the use of gamification to learn English, along with this method, learning based on educational games

can have a positive effect on this research field. Although many researches have been done in the field of educational games for different aspects of learning, the need for research in this field is evident. In this regard, Thibault & Hamari, (2021), state that, despite the increasing number of studies published, research on gamification still needs to continue. as simply executing a gamified design is not sufficient by itself to achieve the objectives pursued through it in the educational setting (Osuna-Acedo, 2021). Examples include but not limited to the lack of a control group, lack of pre-test post-test design, self-reported measurements, short study duration, and small sample size of the reviewed publications. All these challenges and weaknesses in the reviewed publications imply that there is a need for more robust empirical studies in this field of research (Dehghanzadeh et al., 2019). Luo (2022) points to the superficial application of gamification, based on overly simple designs that integrate few elements, as one of the barriers to achieving consistent results in gamification studies in the educational context.

As research to fill this gap, the present study was conducted with the aim of an in-depth investigation in the field of gamification design with a focus on its format.

As the results showed that face-to-face and digital gamification have different effects on learning, recall, and motivation, creating enjoyable learner experiences requires careful consideration.

Another recommendation of this study arise for MDA framework that we consider in our designing. Utilizing the appropriate elements related to Mechanics, Dynamics and Aesthetics, brings you to the goal of creating an effective gamified learning environment.

Declaration of Competing Interest

The author declares that he has no competing financial interests or known personal relationships that would influence the report presented in this article.

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