Research paper

The Power of Gamification on Iranian EFL Learners' Self-Efficacy

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Abstract

Gamification is becoming an attractive concept for teachers and researchers in education as it appears to be an increasingly popular method to motivate learners. This study aims to examine the existing evidence of gamification on the impact of educational gamification on EFL learners' self-efficacy to analyze the advantages of its implementation in English language classrooms. For this, a total of 40 Iranian female intermediate EFL learners were selected through convenience sampling and categorized into two groups (experimental and control groups). The learners of both groups were asked to answer a questionnaire as a pretest and posttest. Flippity and Wordwall websites were applied in the experimental group as the treatment, and the traditional method was used for the control group. The classes were held online. The results demonstrated that gamification as a treatment in the experimental group was effective in the post-test and applying gamified activities had a significant effect on the learners' self-efficacy. However, there was not any significant difference between the pretest results of both groups. The results of this study will help the instructors, syllabus designers, curriculum developers, and learners to provide modern and up-to-date teaching materials to better involve learners in classroom activities.

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Introduction

Gamification or gamified learning is a term used to describe the process of applying game elements and mechanics to instructional settings to motivate and engage learners. With gamification, learners do not play an entire game; rather, they participate in activities that

include elements from games, such as a story, earning points, tackling challenges or quests, receiving badges and other rewards, and leveling up (Zurek, 2017). Teachers should provide opportunities for the learners to enable them to meaningfully and efficiently do tasks with their classmates which causes the learners to feel more self-efficacy about themselves. Nowadays, self-efficacy plays an important role in learners' L2 learning process; therefore, teachers consider this factor to help the learners foster their learning process by using some teaching methods. One of the main factors to enhance self-efficacy is regarded as the accomplishment of performance. Self-efficacy can also be developed through vicarious experience (Raoofi et al., 2012).

The term "self-efficacy" is considered to be the belief of people in their capabilities for producing actual effects and learning/implementing the manners at the scheduled levels (Bandura, 2006, 2012). Self-efficacy and achievement can be enhanced through instructional methods that incorporate modeled strategies, progress feedback, goal setting, and self-evaluations of progress. Also, teachers will foster learners' self-efficacy by applying these and other methods in classrooms (Fatemi, & Vahidnia, 2013).

According to Fatemi and Vahidnia (2013), learners who believe there is no link between their actions and their consequences, rather view factors outside of their control as the cause of what happens to them hold a low level of self-efficacy. Since, they are not expected to exert much effort in performing an activity, and would likely quit as soon as it is feasible to do so, they are less efficacious. Hence, Iranian EFL learners tend to be self-efficacious if they are intrinsically motivated; high levels of intrinsic motivation can be equated with holding high levels of self-efficacy.

Therefore, the researchers of the present study aimed to apply online gamification to explore its effect on EFL learners' self-efficacy. Particularly, this study aimed to address the following research question:

Does gamification have any significant effect on Iranian EFL learners' self-efficacy in online classrooms?

Review of Literature

Gamification

In a study by Wu (2015) 116 pre-service, internship year, and in-service teachers in a large Midwestern university in the USA responded to a survey asking about their current experience, self-efficacy, barriers, attitudes, and perceived challenges of digital game-based learning (DGBL) implementation in the classroom. Findings showed that a majority of teachers were light game players whose gaming activities were mobile-centric. The teachers had positive attitudes toward combining games in instruction and they agreed on applying educational apps and games based on pre-existing familiarity, ease of use, and learnability.

Rachels and Rockinson-Szapkiw (2017) used a quasi-experimental, pretest-posttest, non-equivalent control group design to examine the effect of a mobile gamification application

on third and fourth-grade students' language achievement and student academic self-efficacy. In their study, the treatment group's language instruction was through the use of Duolingo®, a computer and mobile app that uses gamification and adaptive learning technology to teach foreign languages. The regularly planned English L1/Spanish L2 class learning activities were presented to the learners in the control group. The study was 12 weeks in duration. Two instruments covering 50 multiple-choice English-to-Spanish and Spanish-to-English questions were used to assess the students including grammar and vocabulary for controlling the prior achievement of the Spanish language as a pretest and posttest. No significant difference was observed in academic self-efficacy and Spanish achievement of students between two groups of students who were taught by the traditional method and those who used Duolingo®.
Zurek (2017) described formative research conducted on gamification aimed at fostering self-efficacy. This study aimed at recognizing instructional design theory improvements given the scheduled theory sample. Findings illustrated that gamification was effective to guide the gamified instruction design for improving the self-efficacy of learners.

Abdul-Gani (2019) aimed to find out the implementation of the Team Game Tournament (TGT) to improve students' classroom interaction and reading comprehension viewed from self-efficacy. The subject of this study was 30 second-grade students consisting of 14 males and 16 females. The result of the questionnaire showed the students' classroom interactions and reading comprehension about self-efficacy were improved by implementing TGT for the eighth-grade students.

Honarzad and Rasaei (2019) aimed to identify which technology-based out-of-class (TBOCLLAS) activities are more commonly used by Iranian EFL learners outside language classrooms. Furthermore, it explored the relationship between the use of TBOCLLAS by EFL learners and three individual learner characteristics such as motivation, autonomy, and self-efficacy. The participants of the study consisted of 100 Iranian EFL learners. Findings revealed a strong and statistically significant correlation between TBOCLASS and the learners' self-efficacy. Finally, the research findings suggested that learners' motivation, autonomy, and self-efficacy were all significantly contributing to the participants' use of TBOCLASS language learning activities.

Fallah-Vaziabad and Frrokhi (2020) investigated four methods implemented to improve phrasal verb knowledge by two digital apps among Iranian learner-players. In this mixed-method, quasi-experimental research, 174 students of intermediate level participated. The first group was blended learning, in the second group the apps acted as the main tutor, the third group played autonomously, outside of the class and the fourth group was non-digital and gamified, investigating digital applications, via the different contexts of learning as well as gaming components. The results revealed that all groups improved their knowledge although students in games as blended learning in both digital game types outperformed other groups. The game as a tool did not improve as high as the game as a tutor. Students in Phrasal Nerds outperformed Kahoot. Playtime in the game as a tutor was the highest. The game as a tool had the least improvement. The majority of participants prefer a classroom coach. Comparing

Nerds and Kahoot, participants prefer the Nerds app as it includes a storyline. However, among game features, the degree of learning and playing led to a focus on reading and repeating game stages for new phrasal verbs to make new sentences to apply in daily life.

Sepdikasari-Dirgantoro et al. (2022) investigated Moodle gamification's effectiveness on the learning motivation of learners associated with interests in online learning. The subjects of the study were chosen by the method of purposive sampling. This study uses mixed methods running ANOVA to analyze the data. The study finds that Moodle gamification is considered quite effective in motivating students regarding online learning interests. The findings demonstrated that gamification develops the motivation of learners. This research implication is that while learners' motivation is formed via gamification, it will improve the learners' abilities.

Self-Efficacy

Puzziferro (2008) examined performance as a function of grade and course satisfaction in online undergraduate-level courses, specifically students' self-efficacy for online technologies and self-regulated learning strategies. The study contains a community of college students sample (N = 815) who took part in online courses in liberal arts in one term. Findings illustrated that self-efficacy scores of online technologies were not associated with the performance of the students. Effort regulation, the environment of study, and time, which are the subscales of the Motivated Strategies for Learning Questionnaire, were associated with performance significantly. The learners with higher subscales scores derived higher final grades. In addition, rehearsal, elaboration, metacognitive self-regulation, time, and study environment were significantly positively correlated with levels of satisfaction.

Hosseini-Fatemi and Vahidnia (2013) reported on the association between Iranian EFL learners' motivation and self-efficacy. In this research, Language Learning Orientations, General self-efficacy, and English self-efficacy were applied. The participants were 93 male and female EFL learners from four different universities in Mashhad, who was at the graduate (MA) and undergraduate (BA) levels. Findings illustrated that a significant relationship exists between intrinsic motivation and self-efficacy of EFL learners.

Chang et al. (2014) investigated the effects of Internet self-efficacy on motivation and the learning performance of online college students. A total of 87 college students enrolled in an online course. They applied quantitative analysis to explain the relationship between student-perceived Internet self-efficacy and learning performance. Internet self-efficacy impacts on learning performance and student motivation were assessed via variance analysis. The learners who had high Internet self-efficacy were more confident about completing the online course and performed better. Also, there were significant differences in gender where the females presented lower levels of Internet self-efficacy and confidence rather than males; however, females got higher online discussion participation scores and the final exam than males. Regarding learning motivation, the influence of Internet self-efficacy of males on the

dimensions of relevance and confidence in the attention, relevance, confidence, and satisfaction motivation model was stronger than in females.

Yang et al. (2015) investigated how the badge mechanism in digital game-based learning enhanced users' self-efficacy in the subject domain of English as a foreign language. In the study, a digital game-based English learning environment was designed with a badge mechanism including digital badges, leaderboard ranking, and learning practice with star icons. A quasi-experimental design was implemented. A total of 50 third-grade elementary school students participated in this study. Hypotheses were tested, and data were analyzed using paired sample t tests, multiple regression analyses, linear regression analyses, and logistic regression analyses. The results showed that the badge mechanism had a significant positive influence on the learners' self-efficacy and English learning performance. In addition, a subsequent analysis showed that those students with higher self-efficacy performed better than those with lower self-efficacy.

Malinauskas (2017) investigated the effectiveness of training modules in enhancing self-efficacy in teacher education students. Sixty-eight (68) teacher education students participated in this study, 36 of whom were assigned to an experimental group, and the other 32 were assigned to a control group. The training module on enhancing self-efficacy composed of 26 one-hour sessions was applied to the experimental group. A pretest-posttest control group design was used to assess the effectiveness of the training module as well as to collect data. A Teacher Self-Efficacy Scale, a Social Self-Efficacy Scale, and a General Self-Efficacy Scale were applied. The findings showed that this training module on enhancing social self-efficacy was effective on the students' general self-efficacy, social self-efficacy, and teacher self-efficacy beliefs.

Rachels and Rockinson-Szapkiw (2018) examined mobile app impacts on the Spanish achievement and self-efficacy of elementary students and recognized that Duolingo and traditional face-to-face instruction are both powerful in teaching Spanish to elementary students. Besides, Helmi (2018) and Effendi (2018) stated students with high self-efficacy can learn language skills well. However, Rachels and Rockinson-Szapkiw (2018) reported that gamification did not reveal statistically significant changes in young learners' academic self-efficacy beliefs.

Ayllon et al. (2019) examined the relative self-efficacy of learners and need-supportive teaching (NST) importance to obtaining new information on the achievement of higher education learners. They present evidence that teachers' involvement and students' self-efficacy are the two elements most strongly and positively related to achievement. Students gained higher scores when they believe that the instructors are accessible and dependable for suggesting resources, and when they feel able to organize and perform the action courses necessary to acquire knowledge. They also found that students' experience of autonomy support and structure is not correlated with achievement.

Soranastaporn et al. (2019) researched the self-efficacy and English communication strategies (ECS) of 174 participants who registered at international conferences. Players rated their ECS and self-efficacy at a high level after playing the game. ECS significantly and positively correlated with self-efficacy. To conclude, this game encourages EFL players to communicate with foreigners in English. Players of EFL will interact and communicate when they know the way of working as a team. Then their self-efficacy develops.

Rathert and Cabaroğlu (2020) reported on the bilingual activities implementation based on criteria in a course at a Turkish university including 26 young adult EFL learners. To investigate the potential effects of bilingual practice on the learners' self-efficacy, a self-efficacy scale of English was administered before and after the 14-week course. The findings from the interviews suggest that changes in self-efficacy were only partly associated with the implementation of bilingual activities and that unfavorable conditions of the course context overshadowed the potential positive effects of the bilingual practice. However, the results also indicate that the bilingual practice was perceived as conducive to L2 learning and that it may serve as a tool to address the specific needs of learners with diminished self-efficacy.

Lu and Lien (2020) used the social cognitive theory in their study to show the perception traits of learning and playing in game-based environments and for students to identify their self-efficacy toward game-based learning by different trait groups. The game Formosa Hope was used in an experiment with 362 fifth- and sixth-grade students at ages 11 to 12 years as participants. Three perception traits were identified through a two-step cluster analysis: I-strong perceptions of learning and playing, II-moderate perceptions of learning and playing, and III-strong perception of playing but weak perception of learning. This study showed that regardless of trait type, students demonstrated positive self-efficacy, with those with Trait I having significantly higher self-efficacy than those with Traits II and III, indicating that students' positive perceptions of learning and playing are essential in prompting self-efficacy in game-based learning.

The study by Dharmawan et al. (2022) adopted a business simulation game (BSG) as a serious game in the Entrepreneurship course to develop students' self-efficacy, motivation, and engagement. The quasi-experiment was applied to 48 university students. The findings indicated that BSG, based on real challenges in a business environment, allows students to develop their self-efficacy, motivation, and engagement.

Ustun et al. (2022) investigated the effects of Augmented Reality (AR) supported English as a foreign language course on 42 high school students' attitudes towards the English language course, on learners' beliefs of self-efficacy in English and on their motivation towards the instructional materials used in the class. Following a 10-week teaching period, both the quantitative and the qualitative results showed that the AR-enhanced foreign language education significantly improved students' attitudes towards the English language course and increased their beliefs of self-efficacy in the English language.

Cancinoa and Mera (2022) investigated 58 EFL students' self-efficacy beliefs in two contexts: L2-Only instruction (i.e., an approach where lessons are delivered solely in the L2), and L1-L2 instruction. The result showed that the learners in the L1-L2 group illustrated significantly higher scores in the reading and writing components and the learners in the L2-Only group did not significantly decrease their self-efficacy in comparison with the L1-L2 group.

Methods

Participants

The participants of this study were 40 female Iranian EFL learners (Meanage=16, SD=2.1) selected based on convenience sampling as two intact groups (20 students in the control group and 20 students in the experimental group). All the students were at the intermediate level of language proficiency with Persian as their first language. The classes were held online. The researcher was the instructor of both the experimental and control groups.

Instrumentations

The instruments of this study consist of two questionnaires which are mentioned below.

Self-Efficacy

Learners' self-efficacy in a foreign language scale is measured using a 30-item 5-point Likert scale questionnaire developed and validated by Shen (2013). This questionnaire was conceptualized into five constructs: (a) self-efficacy to complete an online course (items 1-8, alpha = .93), (b) self-efficacy to interact with classmates (items 9-13, alpha = .92), (c) self-efficacy to handle tools in a course management system (CMS, items 14-19, alpha = .93), (d) self-efficacy to interact with instructors in an online course (items 20-24, alpha = .94), (e) self-efficacy to interact with classmates for academic purposes (items 25-30, alpha = .93). The overall Cronbach's alpha reliability of the questionnaire was reported .88.

Flippity and Wordwall

Flippity ad Wordwall websites were used as the gamification tools in the experimental group. They are web-based tools and can be accessed by going to their websites. There are many online templates on Flippity and Wordwall such as quiz show, flashcards and so on that could be used in online classes as the interactive activities. Each template has its own game and with the instructions provided.

Data Collection and Procedure

The researcher performed the following steps to establish the effectiveness of using gamification on EFL learners' self-efficacy in online classrooms. Two groups were selected through convenience sampling as experimental and control groups. The researcher herself administered the questionnaire before starting the research to both experimental and control groups as the pretest. Fifteen sessions were held to teach three chapters of American English File book 1. At the beginning of each session, fifteen minutes were devoted to the previous points of each chapter. In this way, the learners were divided into two groups, and some

questions were provided through the Flippity app as the study treatment in the experimental group for assessing how well the participants had learned the previous lesson via applying gamification. In the control group, the learners were asked to answer the same questions on the worksheets provided on their screens. After teaching, in the middle of the class, the teacher shared the screen with the learners in the experimental group. They randomly grouped through the spin wheel of the Flippity app and were asked to start the game by answering the questions that appeared on their screen. The game consisted of some questions with pictures as cues. However, the traditional technique was used for the students in the control group to answer 10 questions in their answer sheets in 15 minutes without applying any gamified app. The entire fifteen-session procedure was accurately controlled in both experimental and control groups. The self-efficacy questionnaire was given to both experimental and control groups as both pre- and post-test. The gathered data was checked, recorded, and analyzed using the SPSS software.

To answer the study's research question, an independent-sample t-test was used to determine whether there are any differences between the two groups' pre-test and post-test results using SPSS.

Results

Inferential statistics examine participants' responses to questionnaire items through a proper statistical test to provide answers to the research question. The current study's data analysis technique, using SPSS26 software, is an independent sample t-test to provide answers to the research question.

At the beginning and the end of the study, a pretest and a posttest in terms of self-efficacy were taken from Iranian female intermediate EFL learners in both control and experimental groups. The descriptive results of both the pretest and posttest scores are shown in Table 1.

Table 1

Group Statistics for Self-Efficacy Pre- and Post-Test

	Groups	N	Mean	Std. Deviation	Std. Error Mean
Totalpre	experimental	20	111.55	14.691	3.285
	control	20	109.20	6.725	1.504
Totalpost	experimental	20	139.80	9.186	2.054
	control	20	119.05	6.345	1.419

Table 1 indicates that the pre-test mean scores of the participants in the experimental group are 111.55 and 109.20 in the control group. This result suggests that the two groups were homogeneous in terms of their self-efficacy and no significant difference was observed between groups in the pretest. Table 1 also indicates that the post-test mean score of the participants in the experimental group is 139.80 and 119.05 in the control group. Both control

and experimental groups progressed in their self-efficacy post-test; however, it is more significant in the experimental group. To see whether this progress was statistically significant or not, the researcher used an independent samples t-test (Table 2).

Table 2

Independent Samples T-Test for Self-Efficacy Pre- and Post-Test

	Levene's Test for Equality of Variances			t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Pre	Equal variances assumed	7.81	.08	3.41	38	.06
	Equal variances not assumed			3.41	26.62	.06
Post	Equal variances assumed	1.76	.19	7.51	38	.00
	Equal variances not assumed			7.51	33.76	.00

As shown in Table 2, there was not any significant difference between the experimental and control groups in their performance in the pre-test but there was a statistically significant difference between their performance in the post-test. Although both groups did better in the post-test, the experimental group outperformed the control group. Therefore, it can be concluded that treatment in the experimental group was effective, and applying gamified activities had a significant effect on Iranian female intermediate EFL learners' self-efficacy.

Discussion

The results of this study showed that gamification as a treatment in the experimental group was effective in the post-test and applying gamified activities had a significant effect on the learners' self-efficacy. These findings are in line with the study by Dharmawan et al. (2022) which adopted a business simulation game (BSG) as a serious game in the Entrepreneurship course to develop students' self-efficacy, motivation, and engagement which allowed students to develop their self-efficacy, motivation, and engagement. Also, Ustun et al. (2022) investigated the effects of Augmented Reality (AR) supported English as a foreign language course on high school students' attitudes towards the English language course, on learners' beliefs of self-efficacy in English. It showed that the AR-enhanced foreign language education significantly improved students' beliefs of self-efficacy in the English language. In addition, Lu and Lien (2020) used the social cognitive theory in their study to show the perception traits of learning and playing in game-based environments and for students to identify their self-efficacy toward game-based learning by different trait groups. The results indicated that students' positive perceptions of learning and playing are essential in prompting self-efficacy in game-based learning. Besides, Soranastaporn et al. (2019) used English Communication Strategies (ECS) as a game. They believed that ECS significantly and positively correlated with self-efficacy. Therefore, this game encouraged EFL players to communicate with

foreigners in English. When EFL players play and learn how to work as a team, they interact and communicate, then their self-efficacy develops. Accordingly, Abdul Gani (2019) aimed to find out the implementation of the Team Game Tournament (TGT) to improve students' classroom interaction and reading comprehension viewed from self-efficacy. The result of the questionnaire showed the students' classroom interaction and reading comprehension about self-efficacy were improved by implementing TGT for the eighth-grade students. Honarzad and Rasaei (2019) also aimed to explore the relationship between the use of technology-based out-of-class (TBOCLASS) by EFL learners and three individual learner characteristics such as motivation, autonomy, and self-efficacy. Findings revealed a strong and statistically significant correlation between TBOCLASS and the learners' self-efficacy. Besides, Rachels and Rockinson-Szapkiw (2018) investigated the effects of a mobile app on elementary students' Spanish achievement and self-efficacy and found that Duolingo is almost as powerful as traditional face-to-face instruction when it comes to teaching Spanish to elementary students. In addition, Helmi (2018) and Effendi (2018) stated students with high self-efficacy can learn language skills well. Also, Zurek (2017) described formative research conducted on the Gamification for Enhancing Learner Self-Efficacy (GELSE) instructional design theory, which was developed to guide the design of gamification aimed at fostering self-efficacy. The results showed that the GELSE instructional design theory is effective for guiding the design of gamified instruction intended to foster learner self-efficacy. Accordingly, Yang et al. (2015) investigated how the badge mechanism in digital game-based learning enhanced users' self-efficacy in the subject domain of English as a foreign language. The results showed that the badge mechanism had a significant positive influence on the learners' self-efficacy and English learning performance.

Conclusion

Gamification can be considered as a factor of entertainment and activeness for learners to improve their learning achievement. To support this, instructors, syllabus designers, and curriculum developers could develop well-organized materials for online classes by applying gamified activities to encourage learners toward communicating and increase their self-efficacy via gamification, and provide modern and up-to-date classroom materials. Low linguistic competence and the small number of opportunities provided to them to socially interact with each other may cause low communication capabilities and self-efficacy in learners. In this case, using games in online classes will provide a positive competitive context that makes the learners communicate meaningfully with a higher level of self-efficacy in a supportive environment.

The results of this study showed that the learners of both groups did not show any great difference in the pre-test which means that they were homogeneous but there was a significant difference in the post-test results in which the learners in the experimental group outperformed the control group. Therefore, the comparison between the pre-test and post-test results showed that applying gamification made a positive effect on learners' self-efficacy in online classrooms as a treatment. Participants in the experimental group significantly showed higher reflection, engagement, and effort than those in the control group. Generally speaking, gamification

encourages motivation, engagement, creativity, collaboration, concentration, self-efficacy, and performance. When the instructors provide an opportunity for the learners to interact with each other without low confidence in a friendly environment, the learners will be able to communicate and collaborate with a higher level of self-efficacy without fear and stress of being judged. On the other hand, learners with low self-efficacy are mostly afraid to do their activities, postpone or give them up soon. They only need to be in a supportive and friendly environment. However, the learners with high self-efficacy do their tasks on their own, make more efforts and finally overcome the problems. Despite the strengths, it should be noted that using a convenience sampling method in this study, does not reveal random sampling features and makes generalization of the results impossible.

To sum up, the educational society such as instructors, syllabus designers, curriculum developers, and learners can take advantage of the findings to better plan, design, and present the materials to make the learning environments more efficient and meaningful. Consequently, in this way, the learners experience positive learning progresses in a supportive environment so they will experience more self-regulatory and flexible strategies; therefore, these positive emotions and signs of progress bring about more engagement which leads to better performance.

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