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IMPACT OF GAMIFIED FLIPPED LEARNING ACTIVITIES ON STUDENTS' SELF-EFFICACY AND ANXIETY LEVELS*

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Abstract
The study examines the effect of gamified flipped learning on the levels of anxiety and self-efficacy of 3rd-grade engineering students in summer school at a state university in Türkiye, in the course "Technical Writing and Communication". A one-group pretest-post-test design was employed as the research method. Two validated and reliable scales were used to collect data from the participants: (1) Foreign Language Classroom Anxiety Scale, and (2) English Self-Efficacy Questionnaire. 40 students took the tests. Five students were interviewed at the end of the summer school to gain a clearer insight into their feedback on the gamified flipped learning process. Pre-test and post-test results demonstrate that, while flipped learning with gamified in-class activities decreases students' anxiety, it increases their self-efficacy. The course design enabled students to experience lower anxiety and improved self-efficacy at the end of the course. Students' self-efficacy was examined by comparing pre- and post-test scores theon and English Self-Efficacy Questionnaire. Students' post-test scores on sel improved at tscores he end ofbyhe course. Furthermore, student interviews reveal that familiarizing students with the content through classroom videos and Kahoot activities positively affected learning.

Key words: Kahoot, self-efficacy, anxiety, active learning, gamification

OYUNLAŞTIRILMIŞ TERS-YÜZ ÖĞRENME ETKİNLİKLERİNİN ÖĞRENCİLERİN ÖZ-YETERLİKLERİ VE KAYGI DÜZEYLERİ ÜZERİNDEKİ ETKİSİ

Özet
Bu çalışma, Türkiye'de bir devlet üniversitesinin yaz okulunda, "Teknik Yazım ve İletişim" dersi kapsamında öğrenim gören üçüncü sınıf mühendislik öğrencilerinin kaygı ve öz-yeterlik düzeyleri üzerinde oyunlaştırılmış ters-yüz öğrenmenin etkisini incelemektedir. Araştırma yöntemi olarak tek gruplu ön test–son test deseni kullanılmıştır. Katılımcılardan veri toplamak amacıyla geçerliği ve güvenirliği kanıtlanmış iki ölçek kullanılmıştır: (1) Yabancı Dil Sınıf Kaygısı Ölçeği ve (2) İngilizce Öz-Yeterlik Ölçeği. Çalışmaya 40 öğrenci katılmıştır. Yaz okulu sonunda, oyunlaştırılmış ters-yüz öğrenme sürecine ilişkin öğrenci geri bildirimlerini daha derinlemesine anlamak amacıyla beş öğrenci ile görüşmeler gerçekleştirilmiştir. Ön test ve son test sonuçları, sınıf içi oyunlaştırılmış etkinliklerle desteklenen ters-yüz öğrenmenin öğrencilerin kaygı düzeylerini azalttığını ve öz-yeterliklerini artırdığını göstermektedir. Ders tasarımı, öğrencilerin ders sonunda daha düşük kaygı düzeyleri deneyimlemelerine ve öz-yeterliklerinin gelişmesine olanak sağlamıştır. Öğrencilerin öz-yeterlik düzeyleri, İngilizce Öz-Yeterlik Ölçeği ön test ve son test puanlarının karşılaştırılması yoluyla incelenmiştir. Bulgular, öğrencilerin öz-yeterlik son test puanlarının ders sonunda arttığını ortaya koymaktadır. Bunun yanı sıra, öğrenci görüşmeleri, ders öncesinde izlenen videolar ve Kahoot etkinlikleri aracılığıyla içeriğe aşinalık kazandırılmasının öğrenme sürecini olumlu yönde etkilediğini göstermektedir.

Anahtar kelimeler: Kahoot, öz-yeterlik, kaygı, aktif öğrenme, oyunlaştırma

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1. INTRODUCTION

Flipped learning, like some other alternatives to traditional learning methods, has gained significance, especially with the COVID-19 pandemic. The important advantages it provides both for students and lecturers justify its role in the continuity of education (Kim, 2024). Flipped learning (also known as flipped teaching, flipped classroom, or inverted classroom) dates back to 2007 in the USA. Jon Bergmann and Aaron Sams, who were chemistry teachers, were working on a solution to help non-attending students catch up on lessons. Then, they created lesson materials and slides for their students to study and follow the course contents. When they realized this model was useful, they developed in-class activities to promote active learning (Lee, 2017).

Flipped learning is a pedagogical method in which learning materials are presented before class. In this way, it can be said that flipped learning is an instructional model since the lecturer assigns the required course material (Lee, 2017). This is also beneficial because it will save students more time to be more actively engaged in class, completing exercises or tasks related to the subject. The lecturers can spend less time explaining the subject theory in class. Instead, they will design tasks or activities that involve students' active participation. Furthermore, student collaboration on tasks such as role-play or group work will make the learning process more meaningful and realistic. As a result of this collaboration, students will create something together, requiring high-order thinking skills.

COVID-19 is not currently a cause for concern. People have returned to their normal lives, resuming their routines as if the pandemic had never occurred. However, the education system has been equipped with various techniques that rely more on technology. In addition, the techniques now used offer a more flexible approach to teaching and learning than traditional methods.

According to Bloom's taxonomy, students can use skills such as analyzing, evaluating, and creating when lecturers set objectives and design class activities accordingly. Students' pre-class preparation to understand the course material can be regarded as low-order thinking skills, whereas their in-class activities develop their higher-order thinking skills through questioning, analysis, application, and creation (Guo, 2021a). Students can work at their own pace in the flipped classroom by watching the asynchronous video as self-study material before class. Exposure to the theoretical part of the subject before class prepares students for the tasks that involve higher-order thinking skills. Individual or collaborative tasks, depending on the subject, enable students to improve their critical thinking skills, leading them to higher levels in Bloom's Taxonomy (Zainuddin & Halili, 2016). Learning remains at the lower stages of Bloom's Taxonomy if students are not provided with activities that require active participation with the target subject or content that has been previously instructed. This is also important because it means that students need to be more active in class than the lecturer. Accordingly, the learning process inevitably becomes a student-centered journey. Students take control of their own learning by completing the pre-class tasks assigned by the lecturer. Pre-class learning materials are significant in flipped classes because they are used to assess students' recall and understanding skills, preparing them for more advanced classroom activities (Guo, 2021b).

Another significant advantage of this situation is that students become more autonomous in their learning. Working on a task as a group, role-playing about the given subject, or discussing the content with a friend in class enables students to follow a set of steps and organize the activity outline. Students are expected to fulfill the tasks with the instructions and learning materials provided before class. Traditional, more teacher-centered courses do not offer students the engaging atmosphere of flipped classes (Sam, 2016). The more engaged learners are in class activities, the more autonomous they become. It is possible to suggest that, in addition to the learning materials, in-class activities are critical because they address students.

Therefore, lecturers are required to plan in-class tasks so that they capture students' attention and encourage active learning. When students are actively involved in tasks, they become more motivated and confident, indicating increased self-efficacy. This is important in language learning.

According to Bandura, people possess a system that influences their actions, decisions, and performance. This system relates to cognitive patterns that play a significant role in learning (Pajares, 1996). In teaching English, self-efficacy is about a student's belief in their own learning process. They have a self-image of how successful they are at learning English. Bandura points out that one's feelings and opinions are critical factors in controlling one's actions in the learning process. Self-efficacy can be considered a form of self-reflection that provides a person with feedback on their performance on each task (Pajares, 1996). Self-efficacy plays a significant role in a student's motivation. The lesson material, whether an asynchronous video or a reading text, is provided to the student before class, allowing time for self-study to review the subject's theory. This will make students feel more confident in class, as they are familiar with the background information on the content. It inevitably positively affects students' self-efficacy (Awidi & Paynter, 2019). Students with higher self-efficacy have a more positive attitude towards the learning process. They believe that they can succeed in learning English. This also helps them stay more motivated. The more they achieve the tasks, the higher their self-efficacy. When a student has created a set of minds related to their perception of their performance on the task, how much their communicative skills improve also plays a significant role in their academic success. It is essential to provide students with a creative learning environment whenever possible. As the lesson's content is shared with students before class, they become familiar with the subject. Thus, learning becomes a more student-centered activity, requiring students to be involved in tasks that demand higher-order skills. Cooperation with peers, problem-solving, and model creation are examples of such activities (Zhao et al., 2021).

Students' performance in a foreign language class is also related to their experience of foreign language anxiety (FLA). Students learning a foreign language may feel stressed, especially when they need to perform a task in class. This anxiety can be observed at different levels and forms. Some students experience nervousness, while others feel fear (Çubukçu, 2008). If a student has FLA, they believe others in the class do better than they do. Furthermore, they think that their performance is considered poor by their classmates (Horwitz et al., 1986). Moreover, there are different types of anxiety underlying FLA. One of the anxieties is about communication anxiety, which can be seen if the student needs to come to the front of the class to talk about a subject, for instance. The student is afraid of not understanding the other student's speech and, at the same time, of not being understood by others. As for test anxiety, the student is afraid of tests because of making a mistake, which is related to another type of anxiety, which is being evaluated negatively by others (Horwitz et al., 1986). The student may feel that when they are doing a role play, their friends make fun of them or criticize their performance. It is important that students be provided with a supportive learning environment in which they feel confident and safe. Flipped learning enables students to prepare before class by watching an asynchronous video at their own pace, any time they want. This is important to the student as they know what is expected from them before the lesson. In addition, the student will feel more confident considering the content presented beforehand. At this point, flipped learning provides a suitable learning environment for teachers to design and implement, thereby enhancing active learning. Teachers will have more time to give students feedback on classroom tasks. As students are required to participate in classroom activities, they will be actively engaged rather than just listening to a lecture. This is also important for retention. Another important point is that teachers are required to support their students as coaches in flipped

classes, so when students are actively involved in role-plays or case studies, their “coaches” encourage them to do better next time (Chou et al., 2021).

As a flexible model, flipped learning enables students to become autonomous learners. This can be a challenging issue for some students, though. For this reason, integrating games (gamification) into the flipped learning environment can make the process less difficult and more enjoyable. Gamification is generally defined as a pedagogical approach that uses game elements in non-game environments (Lo & Hew, 2020). Flipped learning is supported by games in order to enhance student engagement and motivation (Huang & Hew, 2018). When classroom activities are enjoyable, students are more willing to participate, and flipped learning with gamification can boost this willingness by supporting the Self-Determination Theory (SDT) needs of autonomy, competence, and relatedness (Albshry, 2024). Students are required to study the course material at their own pace before class. Thus, it is their responsibility to focus on the content and to understand the material before the lesson. This also enhances one’s competence in the subject. While students are in class, they will work on tasks based on the shared material. They need to be competent about the subject if they want to do well in the tasks. In-class tasks are generally designed to develop higher-order thinking skills, including critical thinking, creativity, collaboration, and questioning. Gamification helps create social relatedness in the classroom. Students share a sense of belonging as they participate in the game. Avatars, badges, or points are used to announce students’ success without being judgmental. This can be considered as support in the learning environment. Taking charge of your own learning is supported by an enjoyable and positive surrounding shared by a small community, which is a class this time. Loyalty, social attachment, and collaboration enable students to feel socially accepted (Nortvig et al., 2018).

In a previous study (Bezircilioğlu & Yürüm, 2023), researchers examined how online flipped learning could reduce language-learning anxiety and enhance students’ self-efficacy. Building on these findings, the present study strengthened the in-class component through gamified activities. To ensure students came to class prepared, they were required to watch an asynchronous lesson video in advance and complete a short video-based writing task. Unlike the earlier implementation, this task was graded, making pre-class preparation more consistent and supporting meaningful participation during class.

2. METHOD

This study employed a one-group pretest-posttest design (Campbell & Stanley, 1963). This study aimed to evaluate the impact of gamified flipped learning activities on students' self-efficacy and anxiety levels within a specific group. Due to logistical constraints, a control group could not be formed, as it was not feasible to split one class into "learning" and "non-learning" groups for the research. Additionally, it was deemed important to observe behavioral changes within a single group.

To establish a baseline for comparison, a pre-test was conducted to measure students' anxiety levels and self-efficacy before implementing the gamified flipped learning activities. This baseline was essential for assessing the intervention's impact.

The study lasted five weeks, which is relatively short. Thus, threats related to history or maturation, as discussed by Campbell and Stanley (1963), were minimized. The primary concerns with a one-group pretest-posttest design are threats to history and maturation. However, given the brief time frame, it was unlikely that any significant changes in maturity would occur, and no noteworthy incidents happened in the classroom that could affect the results.

A pre-experimental one-group pre-test post-test design is used in the present study (Campbell & Stanley, 1963). True experimental designs are preferred for their higher validity; however, the pre-experimental design was the most feasible for this specific educational setting.

Furthermore, the pre-experimental one-group pre-test-post-test design is a common design in educational research. For instance, Sun et al. (2022) used this design to examine the effects of 3D printing and rapid prototyping on students' learning outcomes in a classroom setting. They used one class of middle school students. In another study, Lysenko and Abrami (2014) noted that the quasi-experimental research design was one of the study's weaknesses. There was one control and one experimental group, but there was no randomization. Postareff et al. (2007) conducted a study with 200 educators to examine the effects of pedagogical training on teaching in higher education. The teacher training was given to all teachers over a period; therefore, a control group was not applicable.

Research Questions

There are three main research questions in this study:

RQ1. Does flipped learning with gamified lessons decrease the anxiety level of the students?

RQ2. Does flipped learning with gamified lessons improve students' self-efficacy?

RQ3. Do the technology-enhanced class activities improve students' language skills?

2.1 Participants

The participants (N=40) are 3rd-grade male and female engineering students aged 20-21. The sample consisted of 22 male and 18 female participants. They took the Technical Writing and Communication course at a public university's summer school in Turkey. The course is mandatory for students studying Mechanical Engineering, Energy Systems, and Materials Science and Engineering during the regular term. Students who wish to take the course in the summer session to alleviate their schedule can register for the summer school offering. This course is designed to develop students' technical English skills. The medium of instruction at the university is English. This group was chosen using convenience sampling, as explained by Johnson and Christensen (2019). It was the most suitable sampling method because the group was an intact classroom for this study. Convenience sampling could be considered the most suitable strategy in an educational context, as in the present study, because a real classroom setting provides a high level of ecological validity. Engaging an intact group in research provides educators with essential insights to effectively implement pedagogical tools, such as gamified flipped learning activities, in their classrooms. Furthermore, the naturalistic setting was significant, as the study aimed to observe the impact of gamified flipped learning activities on students' anxiety and self-efficacy during the normal school period. In addition, choosing Johnson and Christensen's (2019) convenience sampling was a practical reason since the researcher was already teaching the class, ensuring a seamless and effective data collection process.

Participants registered for this course because it was compulsory on their third-year syllabus. The students' departments were Mechanical Engineering, Energy Systems Engineering, and Materials Science Engineering. The students' English proficiency level was assessed as Upper-Intermediate, corresponding to B2 on the Common European Framework of Reference for Languages (CEFR), as this is the exit level of the institution's English Preparatory Program. The participants consisted of students who passed the Proficiency Exam at the beginning of the year they entered the university, as well as those who successfully completed the English preparatory program at a B2 exit level. Moreover, a third-year technical English course requires at least B1 proficiency. The institutional mandatory exit level in the English preparatory program is considered the participants' level of English proficiency in the current study. The participants were all native speakers of Turkish. The participants were not familiar with the gamified flipped learning activities; therefore, it was possible to measure their gain scores.

At the end of the course, five students were interviewed about the questions below, and the interviews were recorded with their permission. The researcher used purposive sampling to select participants for the interview, based on their completion of the course and engagement in class activities. They were from different departments, but all of them were in their third year. There were three males and two females in the focus group. Semi-structured interviews were conducted with each student individually via Microsoft Teams. This pattern allows participants to add more comments and to share their opinions about the subject in a more flexible way. Each interview lasted nearly 15 minutes. Interviews were recorded with the participants' permission. These recordings were transcribed verbatim.

--Did the course contribute to you in terms of (a. writing, b. listening, c. reading, and d. speaking)? How did the course contribute to you in terms of (a. writing, b. listening, c. reading, and d. speaking)? a. If it did not, why did it not contribute?
--Did you feel anxious during the course? When? Why? a. If you did feel anxious, how can we reduce this anxiety?
--What is your general feedback about the design of the course?

2.2 Instruments

The data was collected through two validated and reliable scales: (1) Foreign Language Classroom Anxiety Scale (FLCAS), and (2) English Self-Efficacy Questionnaire (ESEQ). FLCAS was developed by Horwitz et al. (1986). The purpose of the FLCAS was to measure students' anxiety toward a foreign language. It contains 33 five-point Likert-type items, ranging from 1 (Strongly disagree) to 5 (Strongly agree). ESEQ, developed by Wang et al. (2014), aims to measure students' beliefs about their English capabilities. There are 32 seven-point Likert-type items, ranging from 1 (I cannot do it at all) to 7 (I can do it well). It also includes 4 basic English skills: Listening, Writing, Reading, and Speaking. These two scales were used because they are among the most common and reliable in this kind of research. The FLCAS was chosen on purpose because it differs from the general performance anxiety by focusing on language-specific anxiety. The FLCAS in the present study demonstrated high reliability (Cronbach's alpha = .93). The ESEQ was selected for its multidimensional structure, which measures self-efficacy across four language skills. This was significant because it enabled the researchers to examine the effects of the gamified flipped learning model on language skills separately. The ESEQ in the current study demonstrated high reliability (Cronbach's alpha = .97).

2.3 Procedure

During the first week of summer school, students completed pretests to assess their anxiety levels and self-efficacy in learning English as a foreign language. A total of 40 students participated in these pretests. Afterward, the students received an introduction to the course, followed by a review of the course syllabus. In the applied flipped learning, the lecturer shared the same type of video lecture with the students two days before the face-to-face lesson time each week through a learning platform (Microsoft Teams). These videos were professionally recorded in the green box studio at the Distant Learning Centre. Students were asked to watch four video lectures before the class. Then, students were assigned to write a short summary of the video and submit it through the same learning platform weekly. Each video was graded out of five points. It was sufficient to write a summary of the video lecture focusing on the main ideas and key points about the subject. At the beginning of the second week, the students were provided with a video lecture on technical writing skills. This subject was the title to be studied in the second week. The lecturer used Kahoot to run quizzes on technical writing skills in class

to review the subject. The questions were prepared by the lecturer herself. In the third week, the video lecture was about professional communication skills. The students wrote their summaries after they watched the video lecture. During the class, Kahoot was used to play quiz games about the video lecture again. In the fourth week, the subject was how to prepare poster presentations. Students watched the video lecture before the lesson and submitted their summaries. The review of the subjects was again conducted through Kahoot quizzes in class. In the fifth week of the course, students were provided with a video lecture on effective communication skills. The class review exercises were conducted via Kahoot quizzes, whose questions were prepared by the lecturer, as in previous weeks. In the sixth week of the course, students delivered their poster presentations in class. This was the last week of the course. The post-test was given to the students in the sixth week. While evaluating the students' summaries, the lecturer considered whether they had referenced content from the video lectures.

3. RESULTS

A mixed-methods design was used to collect data in the current study. The quantitative and qualitative results of the study are separately presented below.

3.1 Quantitative Results

As shown in Table 1, pre-test and post-test results demonstrate that, while flipped learning with gamified in-class activities decreases students' anxiety, it increases their self-efficacy. The course design enabled students to experience lower anxiety and improved self-efficacy at the end of the course. As shown in Table 1, students' post-test scores for self-efficacy improved at the end of the course. Therefore, it is possible to claim that the flipped learning design, supported by gamified in-class activities, enabled students to gain a more positive understanding of their own learning process.

Table 1. Results for students' anxiety and self-efficacy levels

Variable	Pre-test	Post-test	p-value
Anxiety	2.73	2.43	0.000
Self-Efficacy	5.20	5.51	0.007

The skill-based results also demonstrate that students' self-efficacy in writing, speaking, reading, and listening improved at the end of the course. Table 2 presents a comparison of the pre-test and post-test results for students' skill-based self-efficacy. It is possible to observe the improvement in students' English language skills, as presented below.

Table 2. Self-efficacy in four skills

Variable	Pre-test	Post-test	p-value
Listening	5.27	5.47	0.094
Speaking	5.14	5.52	0.006
Reading	5.31	5.60	0.011
Writing	5.07	5.45	0.003

Considering the four skills presented in Table 2, the improvement in listening self-efficacy appears to be slight and not statistically significant. Regarding self-efficacy in speaking, the improvement is statistically significant, as shown in Table 2. When self-efficacy in reading is considered, Table 2 also indicates an improvement in this skill. As presented in Table 2, self-efficacy in writing improved significantly at the end of the course.

The pre-test-post-test results and student interviews reveal that the flipped learning course design, enhanced with in-class gamified activities, reduces students' anxiety and improves their self-efficacy in language skills, especially writing, reading, and speaking. This suggests that students felt more confident in their technical English skills through structured writing tasks, presentations, and interactive class activities.

3.2 Qualitative Results

Five students were interviewed at the end of the course to gather additional feedback on the course, including whether they thought it had contributed to their skills, reduced their anxiety, and shaped their overall impressions. These interviews were conducted online, on a voluntary basis, and recorded on a learning platform with each student's consent. Both researchers coded the themes, and the reliability was 92.

The interviews were analyzed thematically. Braun and Clarke's six-phase thematic analysis framework (2006) was employed here, which includes (1) familiarization with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) writing the report. The main themes were presented in Table 3 below:

Table 3. Student Interviews

Main Theme	Sub-Theme	Quote	Interpretation
Language Skills	Speaking	"Speaking was the most efficient part of the course."	Speaking activities and presentations improved students' self-efficacy in communication competence.
		"The course improved my presentation skills."	
	Writing	"Summary writing was good."	The course raised students' awareness about the features of technical writing. Students' self-efficacy in writing skills improved.
		"The course taught me to write more accurately in technical English. I learnt that long sentences aren't preferred in technical English."	
Anxiety	Reduced Anxiety	"I overcame my anxiety with presentations."	Supportive class environment and collaboration with friends reduced students' anxiety level.
		"I was having anxiety but you (the lecturer) were very supportive, so I felt better."	

	Confidence	"I didn't feel anxious because we all and were doing the same thing".	Equality in participation made students feel confident.
Overall impression	Usefulness	"Videos were useful". "Sharing the subject before class through videos is good; it creates familiarity. It's better than assigning the text." "Videos were effective." "It was very good to know the subject beforehand thanks to videos; it was useful."	Asynchronous videos as pre-class self-study material were useful. Also, students found videos more useful compared to other lesson materials for assignment.
	Effectiveness	"Kahoot and activities were good." "Kahoot was effective." "Kahoot was good; it was easy to participate in the lesson." "It was good to practise APA citation style as Kahoot competition because it was a hard subject."	Students were engaged in the lesson willingly as gamification was integrated into the in-class activities.
	Fun in groupwork	"Poster activity about ethics was fun."	Group activities enhance students' communication and social skills. They liked this poster activity because it was fun to work with their posters to focus on ethics creatively as well as critically.

3.3 Discussion

This study aimed to investigate how flipped learning, supported by gamified activities, affects students' anxiety levels, self-efficacy, and language skills in an English for Specific Purposes (ESP) course. A mixed-methods design combining quantitative and qualitative methods was used to gain a deep understanding of students' perceptions of the course design.

RQ1. Does flipped learning with gamified lessons decrease the anxiety level of the students?

Both post-test results and student interviews point out that the students' anxiety levels decrease while self-efficacy improves. As shown in Table 2, students' anxiety levels decrease significantly throughout the course for several reasons. One reason is that asynchronous lesson videos are shared with students before the lesson. This helps them learn familiarity with the subject, which means they will be prepared for what to do in the lesson. Students feel less anxious about the course subject because they can preview it at home (Latiff et al., 2024). When this familiarity is supported by gamified in-class activities such as Kahoot, students' anxiety levels decrease. Another reason for this decrease is that game-based collaborative tasks, such as group poster work, create a positive atmosphere where students feel more relaxed and more confident. Kahoot is a game-based voting system where students do not have to answer questions in front of the class; they can voice their answers. Also, Chen et al. (2022) found that the avatars used in the game helped students feel less anxious when they made a mistake, as avatars or nicknames created anonymity, which avoided potential negative judgment in the class. One of the most significant benefits of such systems is that students do not feel stressed when answering questions about the subject. This also means that students do not feel embarrassed when they make a mistake. It is essential that they verify their understanding of the subject without being concerned about making mistakes (Cutrim, 2008). Students have control over their own learning, without having to announce where they fail in the subject, which gives them confidence. In addition, students enjoy being part of the Personal Response Systems (PRS) because they all feel part of the whole as they engage in the activities. For instance, students participating in our research reported that Kahoot, a PRS, was useful, as shown in Table 3. These systems enable instant responses and feedback during the lesson, allowing students to answer questions anonymously while actively engaged and to collaborate with each other, which creates a positive learning environment (Chan et al., 2019).

RQ2. Does flipped learning with gamified lessons improve students' self-efficacy?

Students' self-efficacy in speaking and writing skills developed most, as shown in post-test results and student interviews. Self-efficacy and confidence are important in language learning. When students know what the lesson will be about before class, they feel more confident because they are better prepared for the subject and the activities. Flipped learning requires that students use recording, video, text, or a learning platform prepared by the lecturer before the lesson. Students were provided with the asynchronous videos on the subject theory, recorded by the lecturer, in the green box in the present study. Students' self-efficacy in writing improved through summary writing tasks on the asynchronous videos. The asynchronous videos were designed as self-study materials for students to use before class. Students were pleased that the lesson content was shared as short videos before the lessons, as shown in Table 1. There was more time for activity and student engagement in the lesson. This is significant because it shifts the lesson format from a lecture-based approach to a collaborative one. Students become active participants in a learning environment where they engage in problem-solving, which positively affects their academic performance (Ahmed & Asiksoy, 2021). Short summary writing tasks were also assigned as a part of the course assessment. The purpose was to ensure the videos were watched before the lesson. In a similar study (Bezircilioğlu & Yürüm, 2023), the asynchronous videos were also used, but they were not a part of the course assessment. Additionally, summary writing tasks helped enhance students' writing skills. This gave them a chance to assess their understanding of the course material before the in-class lesson. Additionally, students received individual feedback on their writing.

Furthermore, the games used in class, such as Kahoot, create a student-centered, engaging, and fun atmosphere for practicing the course material. The badges or leaderboards enable students to receive immediate feedback on their progress. This increases their self-efficacy because they

are intrinsically engaged in the activities, which makes them feel more confident in their learning process (Latiff et al., 2024). In addition, when students are provided with activities to practice their knowledge of the course subject, their self-efficacy increases (González-Gómez et al., 2019).

RQ3. Do the technology-enhanced class activities improve students' language skills?

Students are engaged in high-order learning activities during the lesson, based on the pre-course material they watched beforehand. It is essential to consider that student-centered and engaging activities are more effective because they enable students to actively participate in the learning process (Albshry, 2024; Sailer & Sailer, 2021). In addition, students take the responsibility for their own learning, which improves learner autonomy. This, however, presents another challenge, as expecting students to be in charge of their own learning may not be easy. Therefore, motivating students to explore a new language can be difficult. Technology-enhanced class activities are helpful at this point. Gamified technology-supported in-class activities are effective in motivating students to participate and enabling them to use language skills more efficiently (Smith et al., 2022). Based on the pre-test and post-test results, it can be concluded that students' language skills, especially speaking and writing, improved the most. Students had more opportunities to engage in hands-on activities based on the lecture videos they watched before class. Flipped teaching is useful for students' vocabulary retention and language use because it exposes them to the pre-class material as a self-study resource. It gives them time to review the material as many times as they need. Furthermore, the use of digital tools in teaching makes the learning process more student-centered, as it is based on individual learning preferences (Soltanabadi et al., 2021; Sudarmaji et al., 2021).

The results of the present study show that flipped learning, supported by gamified in-class activities, positively affects students' self-efficacy while decreasing their language learning anxiety. Gamified flipped learning enabled students to engage in class activities without feeling stressed, as they enjoyed the learning process. Kahoot was used to check students' understanding of the subject. The badges, avatars, scoreboard, and podium encouraged them to participate in the in-class lesson. Furthermore, students were familiar with the content before the lesson through short asynchronous videos. The fact that they were assigned to write a short summary of each video made them watch the video before the lesson, which provided them with the content knowledge necessary to prepare for the activities in class. As mentioned, the short interviews revealed that familiarity with the subject through videos increased self-confidence. Moreover, they also demonstrated that using Kahoot for in-class exercises made the class period more enjoyable and engaging. Based on an electronic voting system, Kahoot games were perceived as supporting students' language learning by providing immediate feedback while protecting learner privacy. As an individual student, they learn whether their answer is right or wrong without letting others know (Cutrim, 2007).

4. CONCLUSION

It is obvious that flipped learning has a positive impact on students. Students feel more confident when the lesson materials are shared in advance of the class. They have a chance to prepare for the lesson. This enables students to actively participate in class activities. Moreover, it fosters learner autonomy, as students decide when and how to access the learning materials. In contrast to traditional education models, flipped learning enables students to actively engage in the learning process. Instead of direct instruction, students create their own space by studying self-study materials before class (Sun et al., 2023; Sailer & Sailer, 2021; Sudormaji et al., 2021).

The positive impact of flipped learning increases when it is combined with games. Gamified in-class activities create an engaging, fun atmosphere, making students more likely to participate. The challenge, competition, and fun make students more willing to join the

lesson. Gamified activities help alleviate students' anxiety by providing opportunities to engage without fear of making mistakes. Even if they make a mistake, they know that nobody will judge them. In addition, having students play games in class about the pre-class material makes them more willing to learn it. This creates a class atmosphere based on students' active participation. Learning takes place in a more engaging environment thanks to game elements such as badges, leaderboards, and interaction. In-class games increase students' motivation, making them more engaged in the lesson. The teacher is not the sole authority of the knowledge in the class; instead, students start to take ownership of their own learning (Lo & Hew, 2020; Sailer et al., 2017). Thus, it leads to learner autonomy, requiring students to monitor their own learning process. It can be challenging, as students need to be aware of their responsibilities in their studies. Meccawy et al. (2023) point out that the use of games in the lessons helps students cope with the difficulties they meet in the learning process. It is significant because students feel the positive power of achievement, which builds self-confidence. Furthermore, students' self-efficacy increases as their self-confidence grows, raising their awareness of their own capacity to improve. In addition, the present study demonstrated that gamified in-class activities increased students' self-efficacy in language skills, particularly speaking, reading, and writing, while decreasing students' anxiety. It is worth noting that a supportive classroom atmosphere and collaboration with classmates encouraged students to be more actively engaged in the learning process.

Furthermore, the current study shows that gamified flipped learning offered a range of benefits for both the lecturers and the students. For instance, the writing tasks students did as part of the pre-course preparation were based on the videos they watched in the present study. The tasks provided students with the flexibility to watch the video at their own pace, at any time, and from any location, allowing them to rewind and fast-forward as needed. Students had sufficient time to focus on their own learning after completing the task on the learning platform. They focused on the writing task about the asynchronous video that was assigned before class. Moreover, students tend to manage cognitive load related to the task better when they are involved in technology-enhanced tasks. They can personalize their study time by completing the tasks at their own pace. That is also one of the reasons students love online tasks: they can study at their own pace. In addition, tasks on an online platform can be beneficial for students with busy schedules (Jadhav & Gavade, 2024; Konoplianyk et al., 2021; Sudarmaji et al., 2021). As for lecturers, they have more time to engage students in activities and games during class, fostering a more positive, interactive atmosphere. Additionally, they can better observe how well students perform in activities that require creativity and critical thinking skills. This is made possible because students come to class having already been exposed to the course material through online resources beforehand (İlter & Yeşilyurt, 2021).

However, the present study had several limitations. First, the study was conducted in a single instructional context with a limited sample, and no control group was included. This may restrict the generalizability of the findings. Another limitation is that the study was conducted over a short period during the summer school. The observation over a longer period could have yielded more data.

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