

# Digital Game-Based Learning in Higher Education: ESL Teachers and Students Perceptions

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## Abstract

Digital game-based learning (DGBL) is a new approach in educational settings that aims to engage students, encourage curiosity, and provide a versatile learning experience. It has been integrated into educational settings due to the widespread use of digital games by students. This study examines the perceptions of integrating digital games into English as a Second Language (ESL) classroom among 89 second-year engineering students and 11 teachers at a private university in Chennai, India. Employing a mixed-methods research design, data were collected and analyzed using SPSS software. Unlike previous studies that focus solely on the positive aspects of DGBL, this research highlights both the benefits and potential drawbacks of integrating digital games into English language education. By comparing teachers' and students' perspectives, the findings emphasize the importance of careful selection and integration of digital games and reveal significant insights into the cognitive, affective, and social aspects of digital game-based language learning. These insights are crucial for guiding policy decisions, instructional practices, and resource development in language education. The study underscores the value of digital games as innovative educational tools and advocates for their thoughtful adoption of digital and technology-based teaching and learning in 21st-century in ELT practices can enhance multidisciplinary skill development.

**Keywords:** Digital game-based learning, English language teaching, Gaming, English as a Second Language

## 1. Introduction

Digital game-based learning (DGBL), also known as game-based learning (GBL), is a teaching approach that incorporates digital games into education to achieve educational goals and evaluate students' learning progress (Prensky, 2003; Hung et al., 2018). According to Prensky (2001), "our educational system that was designed to teach no longer matches the learners of today." This approach addresses the generational gap in learning preferences. Today's learners often termed digital natives, process information differently due to early exposure to digital devices. Felicia (2011) and Huang (2011) agree with this view that children nowadays develop skills through early exposure to digital devices, and therefore, it should be acknowledged and taught through video games. As Prensky (2007) humorously notes, "Sure, they have a short attention span – for the old ways of learning!" (p. 9). He emphasizes that DGBL provides opportunities for learning through questioning, exploring, constructing knowledge, interacting with others, and being entertained (Prensky, 2007).

The National Education Policy [NEP] (2020) emphasizes the need for transformative and innovative approaches in teaching and learning, and DGBL has gained recognition for making education more accessible, flexible, and learner-centric, promoting holistic, enjoyable, and engaging experiences for developing cognitive skills for language learners (Rogers & Johnson, 2016). Research from Gee (2003), Squire (2006), and Shaffer et al. (2005) support the potential of video games to enhance learning outcomes, making DGBL an effective tool for language learners.

A recent systematic literature review highlights that integrating digital games has been shown to improve motivation and student engagement to learn (Wang & Tahir, 2020), foster peer collaboration and interaction, provides an enjoyable learning experience (Hwang & Chen, 2022), facilitate knowledge acquisition, stimulate healthy competition, and promote cognitive development, ultimately aiding learners in achieving their educational objectives (Mohamad et al., 2019; Hung et al., 2018).

Previous studies on DGBL have primarily focused on fields other than English language teaching (ELT), such as mathematics (Sun et al., 2021), chemistry, biology, physics, nursing education, and natural science (Chang & Hwang, 2019). Despite its benefits in improving students' learning performance and motivation, integrating it into English language classrooms requires a thorough understanding of its benefits and potential drawbacks. Plass et al. (2015) state that capturing what games offer for learning is crucial for both game design and research.

These studies have focused on school settings and separately examined teachers' and learners' perceptions. The present study aims to bridge the gap between DGBL research and practice in ELT by jointly examining teachers' and students' perceptions of integrating digital games into ESL classrooms at higher education levels.

The study aims to understand the educational impact of DGBL and its integration, effectiveness, engagement, and outcomes. It identifies barriers and facilitators, informs strategies for enhancing DGBL implementation, and aligns with pedagogical goals and stakeholder needs. The findings can guide policy decisions, instructional practices, and resource development for DGBL in language education, especially in developing countries with English as a second language (Bawa, 2019; Kayl, 2008). This may encourage the adoption of digital and technology-based learning approaches in ELT practices can enhance multidisciplinary skill development. The study aims to answer the following questions:

RQ1: What are the perceptions of ESL learners in higher education about DGBL in their learning process?

RQ2: What are the perceptions of ESL teachers in higher education about DGBL in their teaching process?

## 2. Review of Literature

### 2.1 Digital Game-based Learning

Tawafak et al. (2021) observed that the rise of digital technology and the COVID-19 pandemic have resulted in a transition from offline to online teaching and learning, which has significantly impacted students worldwide. As digital natives, students are well-versed in digital activities, including gaming, and many fall into the category of "student gamers. (Prensky, 2001; Perisco et al., 2019). Consequently, the digital game industry has grown, leading to an increase in games designed for learning environments known as digital learning, educational games, or serious games (Sanchez et al., 2019). DGBL, as defined by Xu et al. (2019), is a playful digital activity that aims to achieve specific learning goals while also evaluating students' progress. Digital games have become an integral part of the learning environment (LE) within educational settings, and worldwide acceptance and incorporation of digital games by both learners (Ab Rahman et al., 2018; Taskiran, 2019) and teachers (Chik, 2011; Koh et al., 2012) have paved the way for the development and implementation of DGBL as a significant facet of learning technology (Wang & Tahir, 2020).

In summarizing previous research findings, Zou et al. (2021) presented a set of five crucial characteristics that contribute to the success of digital games in educational settings. The characteristics include the incorporation of fantasy elements, which involve the presentation of intriguing storylines, captivating settings, and engaging scenarios. Another significant characteristic is the involvement of players in the roles of the main characters, creating a sense of identity within the game. Interactivity plays a vital role as well, allowing players to engage and interact with other participants. The provision of rewards, such as scores or achievements, for accomplishing specific targets is an important characteristic. Additionally, digital games should facilitate knowledge improvement by assisting players in enhancing their target knowledge and skills.

Game features like enjoyment and challenges (Chen et al., 2015) influence the effectiveness of DGBL. Enjoyment in games is crucial, significantly impacting achievement (Touati & Baek, 2018). Challenges in games (Chen & Hsu, 2020) improve students' motivation to learn and are a predictor of improved learning outcomes (Hamari et al., 2016). Additionally, competition, as highlighted by Chen et al. (2020), is a critical element that affects various aspects of learning, both cognitive and non-cognitive.

Research on DGBL has expanded beyond the field of English to various fields, including mathematics (Abdul Jabbar & Felicia, 2015), as well as physics, biology, chemistry, nursing education, and environmental science (Chang & Hwang, 2019). Studies have consistently shown that digital games contribute positively in various ways to students' educational experiences, influencing motivation (Lin et al., 2018; Rich & Chapman, 2018; Alomari et al., 2019; Taskiran, 2019; Zou et al. (2021), engagement (Bovermann et al., 2018), self-efficacy (Zou et al., 2021), critical thinking (Chang & Yeh, 2021), retention and reinforcement of knowledge (Bawa, 2019; Krouska et al., 2022; Coleman & Money, 2019), and overall learning outcomes (Zou et al., 2021).

### 2.2 Language Learning Through Digital Games

More research studies conducted in recent years have examined the potential impact of digital games on English language learning, specifically for students studying EFL or ESL. Research shows that learning English through games can significantly improve motivation, engagement (Mathe, 2020), entertainment, peer interaction, cooperation, competition, knowledge acquisition, and students' English-language skills (Pitarch, 2018; Tasikran, 2019; Zhang et al., 2019). Purgina et al.'s (2019) study suggests that the inclusion of digital games in language classes can boost students' test performance and learning enjoyment. Likewise, Ebrahimzadeh and Alavi's (2017) study found that integrating them into vocabulary classes has enhanced students' enjoyment of e-learning. Additionally, according to a study by Lam et al. (2017) using digital games in writing activities had a positive impact on students' ability to generate ideas and express themselves effectively, leading to positive learning outcomes. Also, various studies have found that digital games can significantly enhance students' English-language skills (Pomares Barrera, 2020; Idek, 2019). Collectively, these findings indicate that digital games have promising potential to improve students' cognitive, affective, and social development across various subjects. However, the success of integrating digital games in the classroom depends on teachers' personal interests, skills, and knowledge (Mathe, 2020). Overall, the potential benefits of incorporating digital games in education extend beyond particular subject areas.

### 2.3 Learner Autonomy

According to Holec (1981), learner autonomy refers to the learner's ability to take ownership and responsibility for their learning process, as stated in Boyadzhieva (2016), Majdoub (2016), in his study, emphasizes that the use of digital games fosters learner autonomy due to students' ability to independently operate games on their computer or mobile devices. This, in turn, leads to improved attentiveness and a greater sense of autonomy within an optimal learning setting. The study conducted by Trinder (2016) found that students' independent

utilization of technology contributes to the improvement of their language abilities, particularly in vocabulary and listening. The students have the opportunity to engage in a game, where they actively participate and answer questions within a designated time frame, thereby employing a self-directed and self-regulated approach. This leads to learners being motivated to reach the highest level as they see their points displayed on the scoreboard. Furthermore, according to Majdoub (2016), DGBL has been shown to improve cognitive skills, which are considered vital for increasing the overall learning process. When cognitive strategies are applied, second language learners can connect prior knowledge with current information. Therefore, DGBL serves as a method that supports and fosters learner autonomy.

#### *2.4 Self Determination Theory*

The literature review of DGBL emphasizes the importance of engagement and motivation, which align with the basic principle of self-determination theory (SDT) in understanding human motivation. The theory comprises three fundamental principles: autonomy, relatedness, and competence (Alsawaier, 2018). Autonomy relates to learners' decision-making and problem-solving abilities. Competence is associated with motivation and assists learners in achieving success and overcoming various learning challenges. Relatedness involves establishing social connections, including learners' social standing among others, to foster mutual respect and interdependence. Successful use of technology to promote or hinder education relies on both student and teacher participation and actions, which play a vital role (van Roy & Zaman, 2019). Collectively, these factors can be easily accomplished when employing DGBL.

#### *2.5 Students' Perceptions of DGBL*

According to Wang and Lieberoth (2016), DGBL offered enjoyable learning experiences for ESL students, increasing their concentration and positive attitudes toward learning. However, long-term implementation must consider students' acceptance and willingness to engage with digital games. Fithriani (2018) found that 30 EFL learners in an additional English course incorporated technology, leading to a positive attitude towards DGBL, particularly in relation to the teaching of grammar. Likewise, a study by Gamlo in 2019 revealed that foundation-year students at King Abdulaziz University exhibited improved motivation and performance gains over seven weeks period through the implementation of DGBL. Furthermore, another investigation by Licorish et al. (2018) found that educational tools such as Kahoot effectively increased student engagement and reduced distractions, indicating that educational technology (EDTech) has emerged as an alternative to traditional educational approaches.

#### *2.6 Teachers' Perceptions of DGBL*

Digital games can improve the learning process by efficiently organizing lessons and assessing student performance. DGBL, according to Wang and Lieberoth (2016) and SP, M. R. (2024), offer immersive experience that engage learner, promote language acquisition through interactive narratives and gameplay, and serve as effective tools for assessing and improving students' learning outcomes in an engaging classroom environment. This ensures continuous involvement and promotes a positive learning environment.

An example of such a tool is Kahoot, a widely recognized online game employed in educational contexts to facilitate language teaching and learning. Kahoot serves as a digital game that assists both students and educators in language learning and teaching, as noted by Plumb and LaRosa in 2017. This platform is used to determine students' grasp of language learning concepts. Additionally, Boulaid and Moubtassime (2019) emphasized Kahoot's significance as a valuable assessment tool, especially for university students studying EFL or ESL. This interactive platform can be effectively used for English language skills like vocabulary, aiding in the reinforcement of long-term memory.

As presented in the current review of literature, several studies have examined the impact of DGBL beyond the field of ESL and EFL on various fields, particularly focusing on the perceptions of either teachers or students. However, there is a lack of research in the existing literature that examines the combined perceptions of teachers and students.

### **3. Method**

The researchers employed a mixed-methods research design to examine ESL teachers' and students' perceptions of integrating digital games in higher education. To gather data on teachers' and learners' perceptions of DGBL, two sets of quantitative questionnaires (one set for students and another set for teachers) were administered using Google Forms, capturing insights into their perspectives. After completing the questionnaires, participants were invited to in-depth semi-structured face-to-face interviews aimed at delving deeper into their perspectives on digital game integration and examining their level of agreement or disagreement. As Creswell and Creswell (2017) suggest, a mixed-methods approach allows for a more comprehensive understanding of the research topic. The qualitative data gathered from interviews provides nuanced insights that complement the quantitative findings, contributing to a richer interpretation of the study's outcomes.

#### *3.1 Setting, Participants and Sampling*

Using a self-selection sampling method, the study involved 89 second-year undergraduate engineering students, aged between 17 and 19 years old, with language proficiency levels ranging from B1 to C1 as per The Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR) who were enrolled at a private university in Tamil Nadu, India. Additionally, 11 teachers from the same university also took part in the study. Participants in this study were chosen based on their voluntary consent to participate. The student participants (SP) had past experience in DGBL in previous semesters, specifically in various English language courses such as grammar, vocabulary, and LSRW skills.

Out of the total of 89 participants (50 males and 39 females), four (2 males and 2 females) were chosen for interviews based on their expressed interest and involvement with digital games. Among the students, there were two students (1 male and 1 female) with student participant IDs (SP1 and SP9), representing individuals who enjoy playing digital games, play frequently, and play daily. On the other hand, the other two students (SP3 and SP18) (1 male and 1 female) were chosen as representatives of those who dislike playing digital games and rarely engage in gameplay. Out of the 11 teachers (5 males and 6 females) involved in the study, nine (4 males and 5 females) had prior experience using digital games. Nevertheless, it is essential to mention that out of the teachers involved, one male teacher participant ID (TP8) and one female teacher (TP6) used digital games in their courses. The TP8 had six years of experience, while the TP6 had four years of experience in teaching. However, among the teachers, only two (1 male and 1 female) lacked previous experience in integrating digital games into their courses: one female teacher (TP5) with more than ten years of experience in teaching and one male teacher (TP3) with three years of experience in teaching. Hence, four teachers (TP8, TP6, TP5, and TP) and four learners (SP1, SP9, SP3, and SP18) were included in the interview sessions.

### 3.2 Data Collection Instruments

The researchers developed two sets of closed-ended Likert scale-based questionnaires (one set for students and another set for teachers) and three sets (one set for students and two sets for teachers) of interview questions as research instruments. Table 1 presents the distribution of a questionnaire, outlining various variables and the corresponding total number of items in each category.

Table 1. Distribution of the questionnaire

S. No.	Variables	Total Items
1	Background Information	3
2	Engagement with DGBL in teaching and learning the English language	5
3	Willingness to adopt DGBL as a pedagogical method	4
4	Impact of DGBL on language pedagogy.	6
Total Count		18

During the interview sessions, the students SP1, SP9, SP3, and SP18 were presented with a set of three questions regarding their opinions on the integration of DGBL in their ESL classrooms. They were asked to express their disagreement or agreement with DGBL, provide reasons for their stance, discuss the potential advantages or challenges they may encounter in DGBL, and suggest criteria to identify effective digital games for educational use. On the other hand, the two teachers, TP8 and TP6, with prior experience in integrating DGBL, were interviewed with a set of five questions related to the specific courses in which they implemented digital games, the reasons behind integrating DGBL, how they integrated them into their classrooms, the challenges they faced, and the standards they believe are necessary for effective educational digital games. In contrast, the teachers TP5 and TP3, who had no prior experience integrating digital games into their teaching, were given a set of four questions during their interviews. The questions focused on the courses they taught, the reasons why they chose not to use digital games, the difficulties they encountered, and their perceptions of the important qualities that digital games should possess to be effective in education.

### 3.3 Procedure

**Preparatory phase:** Before distributing the online questionnaire via Google Form, both groups received detailed information through a PowerPoint presentation to ensure their comprehensive understanding of the research context, including its purpose and procedures.

**Consent process:** In addition to the PowerPoint presentation, each participant provided consent by completing a consent form to voluntarily express their willingness or unwillingness to participate in the study.

**Pilot study:** A pilot study was conducted with 15 participants for each questionnaire. The pilot study lasted for one week, during which the participants completed the questionnaires using Google Forms. And their responses were analysed to evaluate the effectiveness of the research instrument.

**Online questionnaire:** Following the pilot study, both participant groups completed an online questionnaire. The data collection for the online questionnaire lasted for two weeks. During this time, the 89 students and 11 teachers completed the 18-item online questionnaire using Google Forms.

**In-depth interviews:** Furthermore, in-depth interviews were conducted with the four teachers and four students for a total duration of approximately 1 hour and 40 minutes. To foster a relaxed environment, the student interviews took place in a group setting, lasting for 20 minutes, while the teacher interviews, which were conducted individually, also lasted for approximately 20 minutes each. To ensure data consistency and achieve data saturation, the interview sessions were recorded to accurately capture the participants' responses and express their perspectives and insights on the integration of DGBL in higher education.

### 3.4 Data Analysis Technique

The collected quantitative data was entered into Excel for analysis using SPSS. The data analysis results are presented using charts, which are segmented into three variables: engagement with DGBL in teaching and learning the English language, willingness to adopt DGBL as a pedagogical method, and the impact of DGBL on language pedagogy. The reliability of two questionnaires, specifically those designed for teachers and learners, was assessed with Cronbach's alpha coefficient; additionally, the correlation between variables was examined using Pearson's correlation coefficient. These statistical analysis techniques added rigour to the research methodology (Dancey and Reidy,

2020), ensuring the reliability of the questionnaires and establishing associations between the variables. In addition to the quantitative data, qualitative data was gathered from the interviews, contributing to a deeper understanding of the topic.

**4. Results**

*4.1 The Results of Cronbach's Alpha Coefficient for Both Questionnaires*

Table 2. Questionnaires' reliability

S. No.	Participants questionnaire	Cronbach's Alpha	N of Items
1	Students' questionnaire	.815	15
2	Teachers' questionnaire	.755	15

Table 2 presents the reliability of the questionnaires, revealing a value of .755 for the group of 11 teachers and .815 for the group of 89 students. Thus, according to Dörnyei and Csizér (2012), the reliability scores of both questionnaires suggest that the questionnaires demonstrate internal consistency and are well-suited for accomplishing the objectives of the study.

*4.2 Questionnaire Results of Students' Perceptions of DGBL*

*4.2.1 Engagement with DGBL in Learning the English Language*

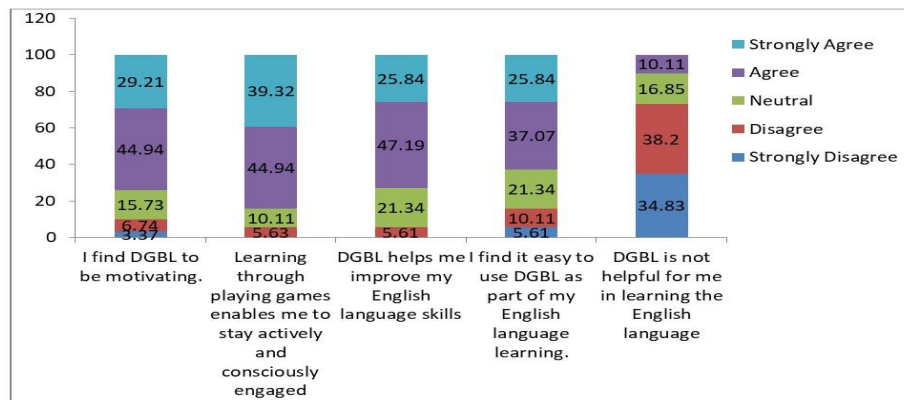


Figure 1. Analysis of engagement with DGBL in learning the English language

As shown in Figure 1, the study analyzed 89 learners' responses to their engagement with learning the English language through DGBL. A majority of students agreed with the positive impact of digital games on language learning, with 74.15% finding them motivating and 84.26% promoting active involvement. Additionally, 73.03% of learners agreed or strongly agreed that learning through playing helps improve their English language skills. However, there were divergent perspectives on the ease of using DGBL, with 21.34% of learners expressing neutrality. The helpfulness of DGBL for learning the English language was also a topic of debate, with 73.03% agreeing or strongly agreeing, while 16.85% held neutrality. Overall, the findings suggest that while most learners acknowledged the motivating and skill-improving aspects of DGBL, opinions differ on its ease of use and overall helpfulness.

*4.2.2 Willingness to Adopt DGBL as a Pedagogical Method*

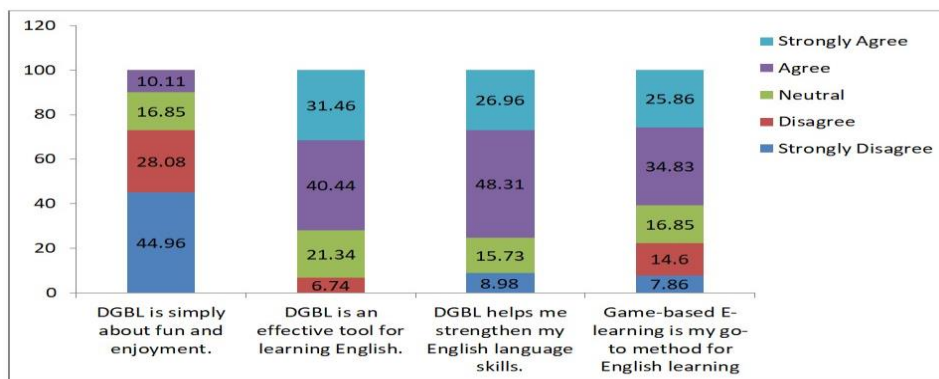


Figure 2. Analysis of willingness to adopt DGBL as a pedagogical method

Figure 2 reveals that 10.11% of learners' acceptance of DGBL in ESL classrooms is simply about fun and enjoyment. A majority of students, 71.9% agreed or strongly agreed that digital games are an effective tool for learning English. 75.27% agreed or strongly agreed that DGBL strengthens skills in the English language. However, the preference for game-based e-learning as the preferred method for English language acquisition varied, with 15.85% remaining neutral and 60.69% agreeing or strongly agreeing. These findings suggest

that although students acknowledge the pedagogical merits of DGBL, their preference for adopting it as their preferred method varies among individuals.

#### 4.2.3 The Impact of DGBL on Language Pedagogy

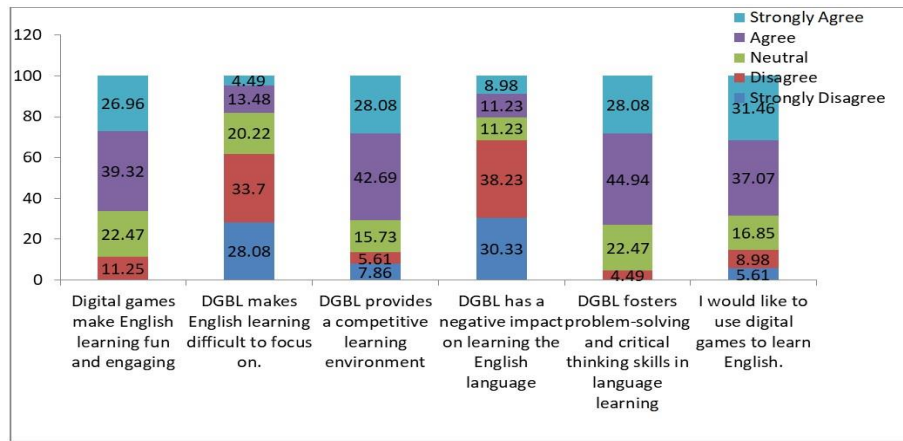


Figure 3. Analysis of the impact of DGBL on language pedagogy

Figure 3 shows learners' perceptions regarding the impact of DGBL on their learning of the English language. A notable majority of 66.28% of them agreed or strongly agreed that DGBL creates a fun and interesting learning experience, boosting engagement and enjoyment. However, 61.78% disagree or strongly disagree that DGBL hinders focus and learning, while 70.77% agree or strongly agree that DGBL encourages a competitive learning environment. In contrast, a smaller proportion, specifically 68.56%, strongly disagreed or disagreed with the idea that DGBL negatively impacts English language learning. Furthermore, 73.02% agreed or strongly agreed that DGBL positively contributes to the development of problem-solving and critical-thinking skills. Lastly, 68.53% agreed or strongly agreed with their willingness to continue using digital games as a tool for learning English. On the whole, learners generally regard DGBL as a beneficial and engaging approach to English language learning.

#### 4.3 Questionnaire Results of Teachers' Perceptions of DGBL

##### 4.3.1 Engagement with DGBL in Teaching the English Language

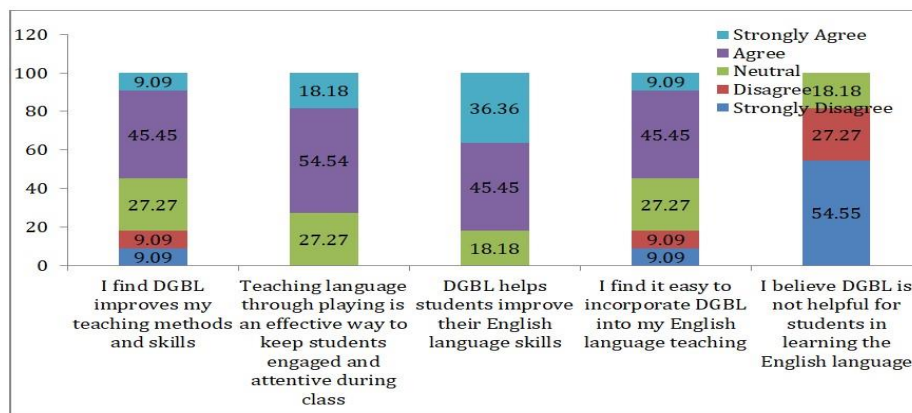


Figure 4. Analysis of engagement with DGBL in teaching the English language

Figure 4 displays the engagement of 11 teachers who have integrated digital games into their language teaching. Among the teachers, 54.54% agreed or strongly agreed that DGBL enhanced their teaching methods and skills, whereas 72.72% believed that DGBL kept students engaged and focused. Furthermore, 81.81% agreed or strongly agreed that integrating digital games contributed to the enhancement of English language skills. However, 18.18% strongly disagreed or disagreed that incorporating DGBL is easy. Nevertheless, 81.82% strongly disagreed or disagreed, suggesting skepticism about its effectiveness in language learning. Overall, the findings suggest that while some teachers perceive DGBL as advantageous for their teaching approaches, there is variability in opinions regarding its effectiveness and ease of adoption.

##### 4.3.2 Willingness to Adopt DGBL as a Pedagogical Method

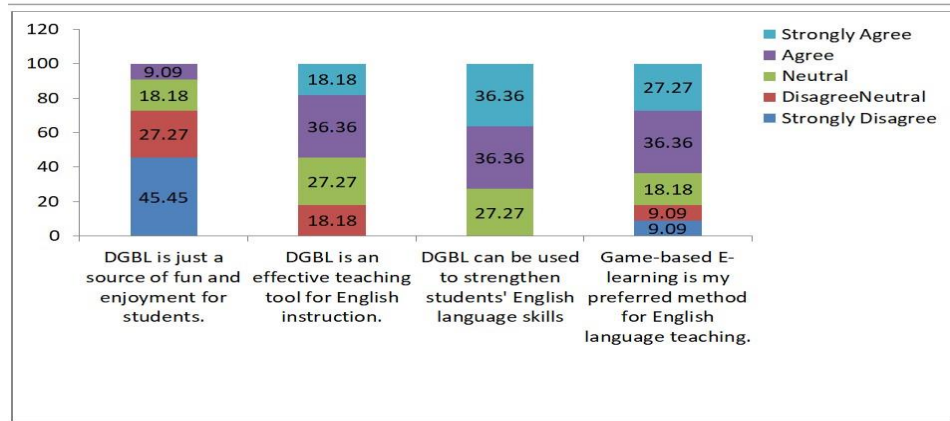


Figure 5. Analysis of willingness to adopt DGBL as a pedagogical method

Figure 5 shows teachers' willingness to adopt DGBL for English language teaching. Among the teachers, 9.09% perceive DGBL as primarily a source of enjoyment for students, while 54.54% either agreed or strongly agreed on its effectiveness as an instructional tool. Moreover, 72.72% hold the perspective that DGBL has the potential to strengthen students' English language skills. However, opinions on the preferred e-learning method for teaching vary. 63.63% expressed their agreement, another 18.18% affirmed disagreement, and 18.18% maintained a neutral stance. Overall, DGBL's effectiveness and its potential for skill enhancement are recognized by many teachers, but preferences regarding its adoption vary among teachers.

4.3.3 The Impact of DGBL on Language Pedagogy

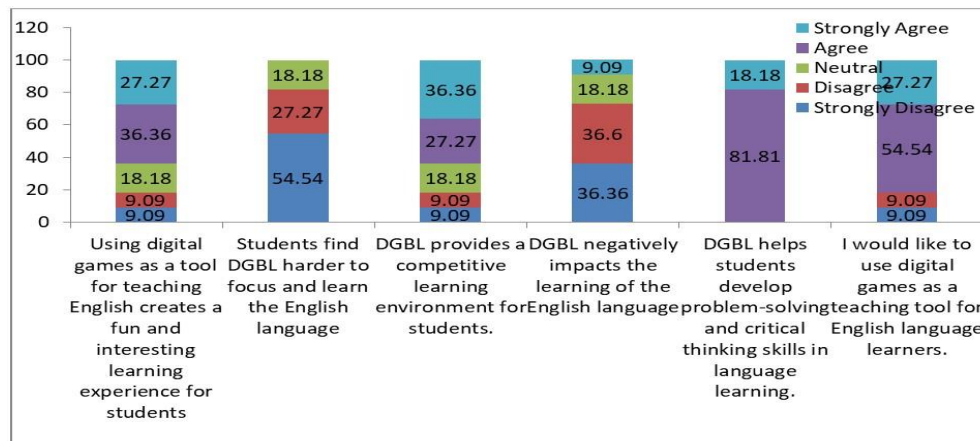


Figure 6. Analysis of the impact of DGBL on language pedagogy

In Figure 6, teachers' responses to the impact of DGBL in English language teaching show a positive perception of the benefits of integrating digital games as a teaching tool. A significant 63.63% agreed or strongly agreed that integrating digital games creates a fun and interesting learning experience, while 81.81% disagreed or strongly disagreed about the perceived difficulty in concentrating and acquiring language skills. 63.63% acknowledged the motivational and competitive aspects of DGBL, while 72.72.61% strongly disagreed or disagreed, indicating no adverse impacts. A significant 99.99% agreed or strongly agreed that DGBL contributes positively to problem-solving and critical-thinking skills. In terms of teachers' willingness to use DGBL as a teaching tool for English language learners in the future, 81.82% agreed or strongly agreed, indicating a desire among teachers to use DGBL. Overall, DGBL has a positive perception and recognition of its benefits in terms of student engagement, motivation, and skill development.

4.4 Correlation Analysis of DGBL Variables for Students and Teachers

The correlation analysis, as depicted in Table 3 and Table 4, indicates significant differences in the perceptions of teachers and students regarding DGBL variables.

Table 3. Correlation coefficient analysis between DGBL variables for students

Engagement with DGBL in learning the English language	Willingness to adopt DGBL as a pedagogical method	Impact of DGBL on language pedagogy
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Engagement with DGBL in learning the English language	Pearson Correlation	1	.250**	.192**
	Sig. (1-tailed)		.018	.002
	N	89	89	89
Willingness to adopt DGBL as a pedagogical method	Pearson Correlation	.250**	1	.234*
	Sig. (1-tailed)	.018		.027
	N	89	89	89
Impact of DGBL on language pedagogy	Pearson Correlation	.192**	.234*	1
	Sig. (1-tailed)	.002	.027	
	N	89	89	89

\* 0.01 level (1-tailed).

\* 0.05 level (1-tailed).

Table 4. Correlation coefficient analysis between DGBL variables for teachers

		Engagement with DGBL in teaching the English language	Willingness to adopt DGBL as a pedagogical method	Impact of DGBL on language pedagogy
Engagement with DGBL in teaching the English language	Pearson Correlation	1	.674*	0.823**
	Sig. (1-tailed)		.023	.002
	N	11	11	11
Willingness to adopt DGBL as a pedagogical method	Pearson Correlation	.674*	1	.755**
	Sig. (1-tailed)	.023		.007
	N		11	11
Impact of DGBL on language pedagogy	Pearson Correlation	.823**	.755**	1
	Sig. (1-tailed)	.002	.007	
	N	11	11	11

\* 0.01 level (1-tailed).

\* 0.05 level (1-tailed).

Teachers exhibit stronger positive correlations between the examined variables than students. For example, the correlation between engagement with DGBL and the willingness to adopt DGBL as a pedagogical method is significantly stronger among teachers ( $r = 0.674$ ,  $p = 0.023$ ) than among students ( $r = 0.250$ ,  $p = 0.018$ ). This suggests that teachers who engage more with digital games are more likely to adopt them in their teaching practices.

Additionally, the correlation between engagement with DGBL and its perceived impact on language pedagogy is notably higher for teachers ( $r = 0.823$ ,  $p = 0.002$ ) compared to students ( $r = 0.192$ ,  $p = 0.002$ ). This indicates that teachers who are engaged with DGBL perceive a greater positive impact on their teaching methods.

Furthermore, the willingness to adopt DGBL shows a strong positive correlation with the perceived impact of DGBL on language pedagogy among teachers ( $r = 0.755$ ,  $p = 0.007$ ). In contrast, correlation is weaker among students ( $r = 0.234$ ,  $p = 0.027$ ). This finding implies that teachers' willingness to adopt DGBL is closely tied to their perception of its benefits in language teaching.

Overall, these results suggest that teachers have more interrelated and positive perceptions regarding DGBL compared to students. Teachers appear to be more convinced of the benefits of DGBL and show a greater readiness to integrate it into their pedagogical practices. This underscores the potential for targeted interventions to enhance student engagement and perceptions of DGBL to align more closely with the positive perspective that teachers already have.

#### 4.5 Students' Interview-based Perceptions of DGBL

A group of four students (SP1, SP9, SP3, and SP18) participated in in-depth interviews. The following three questions were asked to gain insight into the experiences and perspectives of the student group.

Question 1: In relation to the use of DGBL in ESL classes, do you disagree or agree with it?

Participants ID	Response
SP1	I agree that integrating digital games in the ESL classroom is beneficial. It's better than relying solely on verbal explanations and PowerPoint. Games help me understand the material faster, as I often come across similar concepts within the game.
SP9	I agree because it helps alleviate classroom boredom. Playing games brings excitement and enhances my understanding of the material.
SP3	I agree, but I sometimes feel panicked and lose focus due to the time limit during game sessions.



SP18	Yes, I agree because it helps us avoid monotony in learning and provides a refreshing experience. Games enable us to learn and enhance our understanding of the subject matter.
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Question 2: What were the challenges you faced during the implementation of digital games in your classroom?

Participants ID	Response
SP1	Signal issues and insufficient Wi-Fi were major challenges. Additionally, the lack of clear explanations within the games themselves and reliance on the lecturer for explanations posed difficulties and impacted learning.
SP9	The main challenge was the signal, which affected the effectiveness of learning experiences. As the games provided correct answers without explanations, the lecturer had to step in to give explanations, and technical problems with cell phones, such as unresponsive screens, led to interruptions and automatic losses in the game.
SP3	I found the background sound of the digital games to be disruptive, causing me to feel panicked and lose focus.
SP18	The presence of background sound in the digital games was a challenge for me, as it disrupted my concentration and made me feel anxious.

Question 3: What criteria should digital games have for effective classroom integration?

Participants ID	Response
SP1	Digital games should have a variety of question types, like selecting flags, instead of just multiple-choice. They should have a small file size to conserve data and be used offline without requiring data usage. A time limit would make it more challenging and stimulating.
SP9	Digital games should match the students' level and the material being taught. They should provide an explanation for correct answers, which is essential for learning from mistakes. The use of levels, where mastery of one level is required to progress, is beneficial. Additionally, a time limit adds excitement and challenge and prevents boredom.
SP3	It should have a reasonable time limit, provide explanations for correct answers, and include an interesting background sound for added fun. It's important to avoid excessive pictures and animations that can be distracting. The game level should also be considered.
SP18	Should provide a clear explanation of the material before presenting questions. The games should be visually appealing with clear background sound and animations, not just plain text. Colorful visuals are preferred over black and white, and a suitable time setting that isn't too fast should be included.

4.6 Teachers' Interview-based Perceptions of DGBL

The four teachers (TP8, TP6, TP5, and TP3) were individually interviewed in depth about the integration of digital games in ESL classrooms. Interviews were divided into two sessions, with the first session conducted with the experienced teachers TP8 and TP6. The following five questions were asked to gain insight into teachers' experiences and perspectives.

Question 1: In which subjects have you implemented DGBL as a teaching approach within your classroom?

Participants ID	Response
TP8	I used Kahoot, Educaplay, and Genially to teach courses like English Language and Communication Skills and English Grammar and Vocabulary Development.
TP6	I used Kahoot and The Grammar Doom to teach Interpersonal Skills: Listening and Speaking and Business English Communication courses.

Question 2: What are the reasons behind your integration of DGBL in your classroom?

Participants ID	Response
TP8	One of the reasons for integrating DGBL in my classroom is to enhance student engagement

	and participation in the learning process. And also to check students' understanding of the concepts being taught.
TP6	I integrate DGBL in my classroom to foster a more interactive learning experience. The interactive nature of digital games helps create a more immersive and enjoyable learning environment. And to review materials, assess students' learning performance in a quiz.

Question 3: In what ways have you incorporated digital games as a tool in your classroom?

Participants ID	Response
TP8	I primarily created my own questions, occasionally using existing ones and modifying them to suit my teaching materials.
TP6	Due to time constraints, I relied on available questions, particularly for easy structures. But ensured that the questions aligned with the content. I covered and conducted practice games to avoid confusing the students with unfamiliar topics.

Question 4: What were the challenges you faced when integrating digital games in your classroom?

Participants ID	Response
TP8	I think limited internet access and students' data quota pose challenges for playing digital games in the classroom. Students are advised to have enough quotas before playing, but some may have a limited quota and resort to playing with friends.
TP6	Challenges such as getting bored, weak signals, and an unreliable internet connection hinder the use of digital games for evaluating students' performance, emphasising that they are primarily used for enjoyment rather than assessment.

Question 5: What criteria should digital games have for effective classroom integration?

Participants ID	Response
TP8	Good digital games should be affordable, user-friendly, offer a variety of question formats, including a timer, and support self-learning.
TP6	Emphasized the need for user-friendly gameplay, compatibility with teaching materials, visual appeal, and engaging audio to stimulate students' excitement. Offline usability is preferred when internet connectivity is an issue.

The following interview session involved the teachers TP5 and TP3, who had no prior experience applying to DGBL. The following four questions were asked to these teachers to gain insight into their experiences and perspectives:

Question 1: What were the courses you taught?

Participants ID	Response
TP5	I teach courses like Communicative English and Technical English.
TP3	I teach Interpersonal Skills: Reading and Writing and Business English Communication courses.

Question 2: What are the reasons behind the exclusion of digital games from your classroom practices?

Participants ID	Response
TP5	I believe that digital games can enhance the learning experience for university students by creating a joyful and engaging classroom environment. However, I lack the necessary skills and gaming experience to effectively incorporate digital games into my teaching practice.
TP3	Although the language components in my courses, such as grammar, pronunciation, and spelling, are suitable for gamification, I am not proficient in digital technology and have never personally engaged with games.

Question 3: What challenges prevented you from using digital games in your classroom?

Participants ID	Response
TP5	Despite the institution having a reliable internet connection, I need to learn the necessary skills to play the games first. This hinders my ability to integrate DGBL into my classroom.
TP3	Due to my lack of familiarity and personal experience with digital games, integrating DGBL into my classroom become challenging.

Question 4: What criteria should digital games have for effective classroom integration?

Participants ID	Response
TP5	Games must align with the educational content and include visual elements.
TP3	Games should be suitable, visually appealing, engaging, and offer a level of challenge.

### 5. Discussion

The study investigates the perceptions of ESL learners and teachers about the integration of digital games into higher education ESL classrooms. The results show that digital games are an effective instructional approach, enhancing student engagement, improving language proficiency, and improving overall learning outcomes.

The study found that students have a positive perception of DGBL, which is consistent with previous research (Ab. Rahman et al., 2018; Taskiran, 2019), demonstrating students' enthusiasm for integrating digital games in educational settings. Moreover, the study supports the notion that DGBL improves ESL teaching and learning skills and is consistent with the research by Licorish et al. (2018), which highlights the positive effects of educational technology on student performance. Teachers use digital gadgets and digital games to motivate students and stimulate interest, leading to a fun, easy, and knowledge-rich learning experience. This results in high scores and performance in the classroom. It is clear from the study's findings that the participants feel comfortable employing this approach in the classroom due to the significant benefits it offers.

Majdoub's (2016) study suggests that DGBL contributes to the development of students' cognitive skills by encouraging the application of essential mental strategies through digital games. NEP (2020) highlights that a major problem in India's higher education system is the lack of emphasis on developing cognitive skills and learning outcomes. The study's findings support the idea that digital games develop students' cognitive domains, leading to improved performance in teaching and learning.

Based on the interview responses, the study found that students (SP1, SP9, SP3, and SP18) found DGBL to be engaging and motivating, particularly (SP18) for improving comprehension, interest, and mental refreshment. These findings align with previous research that highlights the motivational and engaging nature of digital games in educational settings (Prensky, 2001; Gee, 2003). However, they also faced challenges such as technical issues, lack of explanations, internet connectivity issues, and distracting in-game sound effects, with SP3 highlighting the need for longer gameplay time limits. Kebritchi et al. (2010) and Hamari et al. (2014) indicate that technical difficulties and inadequate support are significant barriers to effective DGBL implementation. To overcome these issues, students recommended aligning games with learning materials, setting time limits, offering different levels, and providing detailed explanations and feedback. These suggestions are supported by research indicating that well-designed digital games that are closely aligned with curriculum objectives and offer adaptive learning paths can significantly enhance learning outcomes (Kiili, 2005; Wouters et al., 2013).

Four teachers (TP8, TP6, TP5, and TP3) shared their experiences using digital games like Educaplay, Genially, The Grammar Doom, and Kahoot to teach grammar, vocabulary, listening, speaking, and business communication. They found these games accessible, motivational, and effective in enhancing critical thinking and comprehension. With TP6, Kahoot reduced anxiety and improved understanding. These findings align with studies highlighting the positive impact of DGBL on student engagement and learning outcomes (Sung & Hwang, 2013; Hamari et al., 2016). Despite these benefits, the teachers also faced challenges like inconsistent internet connectivity and student boredom from repetitive game use. The sustainability of engagement and the need for reliable technological infrastructure are frequently cited as critical concerns (Van Eck, 2006; Connolly et al., 2012). TP8 emphasized the need for affordable, user-friendly games with diverse question types, timed features, and self-learning opportunities. TP6 stresses the importance of aligning games with teaching materials, having offline modes, and incorporating visually appealing features. These recommendations align with best practices for educational game design, advocating for user-centred design principles and adaptive learning mechanisms (Plass et al., 2015; Mayer, 2014).

Inexperienced teachers (TP5 and TP3) often avoid implementing digital games due to a lack of digital literacy and the belief they are more suitable for university students. They suggest that effective games should align with course content, be visually engaging, and offer appropriate challenges. This highlights the need for professional development and support for teachers to effectively integrate digital games into teaching practices (Howard et al., 2021).

The overall positive attitudes of both students and teachers towards DGBL highlight its potential to improve motivation, engagement, and learning in ESL classrooms, but faces challenges like technical issues and the need for better integration with educational content. To overcome these challenges, a multi-faceted approach is needed, including improving technological infrastructure, providing teacher support and training, and designing educational games that align with curriculum objectives and adapt to different learning needs (Baker et al., 2010; Wang & Tahir, 2020).

The study suggests that implementing these recommendations and addressing challenges can enhance the educational impact of DGBL in higher education ESL classrooms. This approach promotes an engaging and effective language teaching environment, potentially integrating technology and promoting learner-centric methods. Additionally it contributes to multidisciplinary skill development and the creation of a proficient global workforce. The study emphasizes the importance of aligning digital games with curriculum goals and ensuring accessibility and usability for all learners, thereby contributing to the growing body of literature on DGBL.

## 6. Limitations

The study's limitations include a specific sample, which may not accurately represent the larger population, limiting generalizability and interpretation. Additionally, relying solely on participants' perceptions may introduce potential biases and insufficient examination of the long-term effects of DGBL on language proficiency and retention. Therefore, in the future, researchers may use experimental research instruments such as pre-tests and post-tests and classroom observation to collect data from teachers and students.

## 7. Conclusion

In conclusion, the findings indicate that digital games have promising potential to enhance students' cognitive, affective, and social benefits. Integrating digital games in an ESL classroom is a valuable educational tool that can enhance the overall ESL learning experience. Collectively, the findings confirm that incorporating digital games proves particularly advantageous for ESL learners as it boosts student motivation, improves student participation, alleviates anxiety, facilitates language proficiency, and improves overall learning outcomes. Teachers find the integration of digital games into their English language instruction to be a practical choice, as it adeptly maintains student engagement and attentiveness during classes.

Digital games in education are beneficial for ESL teachers, as they provide an engaging learning experience for vocabulary, grammar, listening, speaking, and reading comprehension. However, due to a lack of familiarity with technology-driven educational methods, teachers find it challenging to implement DGBL in the classroom. Therefore, educational authorities must organize comprehensive training sessions on advanced technology and introduce motivating incentives to encourage educators to incorporate these innovative approaches.

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## Authors' contributions

Miss. Moniza Ray was responsible for data collection. Both Dr. Ajit and Miss. Moniza Ray, the authors, discussed the research findings, contributed to the interpretation of the results. Dr. Ajit reviewed and approved the final version of the manuscript.

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No additional data are available.

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