



# Technology integration of using digital gameplay for enhancing EFL college students' behavior intention

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## ABSTRACT

This abstract presents a research study that investigates the effects of technology integration (TI) through digital gameplay on English as a foreign language (EFL) college students' behavior intention. The study employs a mixed-methods research design, combining quantitative and qualitative data collection and analysis methods. The quantitative phase involves a pre- and post-test design, measuring the behavior intention of EFL college students before and after engaging in digital gameplay activities. The qualitative phase involves in-depth interviews and focus group discussions to gather students' perceptions and experiences with using digital gameplay in their language learning process. The findings reveal that TI through digital gameplay positively influences EFL college students' behavior intention, including their motivation, engagement, and self-efficacy in language learning. The qualitative data provide insights into students' perceptions of the benefits and challenges of using digital gameplay, highlighting its potential for improving language skills, fostering social interaction, and promoting autonomous learning. The implications of the study suggest that incorporating digital gameplay in EFL college classrooms can be an effective approach to enhance students' behavior intention and contribute to their language learning outcomes. This study contributes to the existing literature on TI in language education and provides practical recommendations for educators and policymakers to leverage digital gameplay for enhancing EFL college students' behavior intention.

**Keywords:** technology integration, digital gaming, behavior intention, EFL college students

## INTRODUCTION

The integration of technology in education has become a prevalent practice, and digital gameplay is emerging as a potential tool for enhancing English as a foreign language (EFL) college students' behavior intention (Al-Obaydi et al., 2023c; Liang, 2021). However, the relationship between EFL and technology integration (TI) remains complex and not fully understood due to many factors such as the pitfalls that online educational systems were suffer all over the world (Pikhart & Al-Obaydi, 2023).

Many studies have explored the impact of gameplay on language skills development (LSD), including vocabulary acquisition, listening, speaking, reading, and writing skills, and have shown promising results in various contexts (Belda-Medina, 2021; Raygan & Moradkhani, 2022). However, it is also crucial to acknowledge that the challenges related to TI in EFL classrooms are multifaceted. One significant challenge is the lack of proper training among pre-service and in-service teachers in effectively integrating technology, including digital game-based learning (DGBL), into their language teaching practices (Dashtestani, 2022). Research has shown that many teachers lack the necessary pedagogical knowledge and skills to effectively incorporate technology into their instruction, resulting in underutilization or ineffective implementation of DGBL in language classrooms (Hubbard & Levy, 2016).

Additionally, other challenges related to TI in EFL classrooms include issues with infrastructure, limited access to technology, concerns about student distraction, and potential language barriers with non-English speaking students. These challenges can impact the successful implementation and effectiveness of DGBL in language learning contexts and need to be considered when exploring the impact of gameplay on LSD (Dashtestani, 2022).

Therefore, while the existing literature on DGBL in EFL education provides valuable insights into its potential benefits, it is important to recognize that addressing the challenges related to TI, including teacher training and other contextual factors, is crucial for the successful implementation of DGBL in language classrooms. Further research and efforts should be directed towards addressing these challenges and promoting effective integration of DGBL in EFL education to fully harness its potential for enhancing LSD.

In this study, we aim to investigate the factors that affect the integration of technology and digital gameplay in EFL contexts and evaluate their impact on enhancing student behavior intention to learn. By examining the factors that influence TI and its impact on language learning, this study can provide valuable insights into the potential benefits and challenges of using digital gameplay in L2 learning and inform the development of more effective and engaging educational programs. There are a number of factors that can impact an individual's behavioral intention (BI) to use gameplay to enhance their technology skills (Tawafak et al., 2022). Some of these factors include the followings:

1. Motivation: The individuals must be motivated to learn and improve their technology skills through gameplay (Gee, 2007). This motivation can be intrinsic (e.g., personal interest in technology) or extrinsic (e.g., pressure from a job or school).
2. Perceived usefulness (PU): The individual must believe that using gameplay to enhance their technology skills will be useful to them.
3. Perceived ease of use (PEOU): The individual must believe that it will be easy for them to use gameplay to enhance their technology skills.
4. Attitude: The individual's overall attitude towards using gameplay to enhance their technology skills will impact their behavior (Mazana et al., 2019).
5. Social influence: The individual's friends, family, and other social connections can influence their behavior by providing support or encouragement.
6. Past experience: The individual's past experience with using gameplay to enhance their technology skills will impact their behavior. If they have had positive experiences in the past, they will be more likely to engage in this behavior in the future.

However, the relationship between EFL and TI remains complex, and the factors that affect the successful integration of technology and digital gameplay are not well understood. This study aims to investigate the factors that influence the integration of technology and digital gameplay in EFL classrooms and evaluate their impact on enhancing student behavior intention. The findings of this study can provide valuable insights for educators and researchers on the potential benefits and challenges of using digital gameplay in EFL education and inform the development of more effective and engaging educational programs. These are the research questions for this study:

1. How does an individual's motivation to learn technology skills through gameplay in English language impact their BI to do so?

2. Does an individual's PU of using gameplay, in English, to enhance their technology skills impact their BI to do so?
3. How does an individual's PEOU of using gameplay in English to enhance their technology skills impact their BI to do so?
4. Does an individual's attitude towards using gameplay in English to enhance their technology skills impact their BI to do so?
5. How does the social factor impact an individual's BI to use gameplay to enhance their technology skills?

## LITERATURE REVIEW

In the context of gameplay, a literature review might include an overview of the various ways in which gameplay has been used to enhance technology skills, as well as an examination of the factors that impact the effectiveness of this approach. Some possible areas of focus for a literature review on gameplay and technology skills might include the various types of games that have been used to teach technology skills, including their features and characteristics.

The effectiveness of different types of games in teaching technology skills has been a subject of research in the field of educational technology. Several studies have been conducted to explore the impact of various types of games on the acquisition and development of technology skills among learners.

For instance, simulation games, which allow learners to engage in virtual environments that mimic real-world technology-related tasks, have been found to be effective in improving learners' technology skills. Research has shown that simulation games can provide opportunities for learners to practice technology skills in a safe and controlled environment, and can help improve their knowledge, understanding, and application of technology concepts and processes (Huang & Liaw, 2018).

Another type of game that has been found to be effective in teaching technology skills is serious games. Serious games are specifically designed for educational or training purposes, and they can provide engaging and immersive experiences that promote learning and skill development. Studies have shown that serious games can be effective in improving learners' technology skills, including coding, programming, digital literacy, and problem-solving skills (Kiili & Leu, 2019).

In addition, gamified learning environments, where game elements such as points, levels, and rewards are integrated into the learning process, have also been shown to be effective in teaching technology skills. Gamification can increase learners' motivation, engagement, and enjoyment, which can in turn enhance their technology skills acquisition (Dicheva et al., 2015). However, it is important to note that the effectiveness of different types of games in teaching technology skills may vary depending on various factors, such as learners' age, prior knowledge, and learning preferences, as well as the design and implementation of the games. Further research is needed to better understand the effectiveness of different types of games in teaching technology skills and to identify best practices for integrating games into technology education (Belda-Medina, 2021; Raygan & Moradkhani, 2022).

Many factors that impact the effectiveness of using games to teach technology skills, such as the type of game, the learner's characteristics, and the learning environment. The ways in which gameplay can be integrated into technology education programs, including the benefits and challenges of this approach. The impact of gameplay on motivation and engagement in technology learning, including any research that has been conducted in this area (Al-Obaydi & Pikhart, 2022; Al-Obaydi et al., 2023c; Jiang et al., 2022; Loes, 2022).

The integration of technology in language education has gained significant attention in recent years, particularly in the field of EFL (Klimova & Kacetl, 2017; Zhang, 2022). The use of digital gameplay in EFL classrooms has been shown to enhance language learning outcomes and promote student engagement. TI is a crucial factor in enhancing student behavior intention towards technology in the classroom (Chen & Wu, 2020). The following are the keyways in which TI can enhance student behavior intention:

1. Supports learning: Effective TI should support student learning and be aligned with the educational goals and objectives. When technology is used in a meaningful and purposeful way, it can enhance student motivation and engagement and promote a positive attitude towards learning.

2. Encourages interaction: TI can provide opportunities for students to interact with the content and with each other, promoting active engagement and collaboration. By providing opportunities for students to participate in activities and discussions, TI can enhance student behavior intention towards learning (Almulla, 2020). Autonomy of students, on the other hand, could be developed in playing games but not in learning specifically in extracurricular games (Al-Obaydi et al., 2023a).

The impact of online social interaction on student behavior intention can be influenced by various factors, including the quality and nature of the interaction, the level of support and guidance provided, the degree of competition among the participants (Al-Obaydi et al., 2023b), and the level of anonymity and privacy afforded to students. When used effectively, online social interaction can enhance student motivation, engagement, and learning. In conclusion, online social interaction is an important factor to consider when examining the impact of technology on student behavior intention. By understanding the potential benefits and risks of online social interaction, educators can develop educational programs that effectively leverage the power of technology to enhance student learning and engagement (O'Reilly, 2020).

### Gameplay Usage in Undergraduate Learning Process

There are a number of ways in which gameplay can be used in the undergraduate learning process to enhance technology skills. Some examples may include using games as a learning tool: game-based learning approaches can be used to teach technology concepts and skills in a more engaging and interactive way. Gamification of coursework: technology coursework can be gamified by adding elements of competition, rewards, and challenge to assignments and projects. Game design projects: students can work on game design projects as a way to learn about and apply technology skills. Incorporating technology skills into game-based assessments may lead to the students to demonstrate their technology skills through game-based assessments, such as creating a new game to demonstrate their understanding of a particular concept (Wardoyo et al., 2021). Using games in technology-based extracurricular activities: students can participate in extracurricular activities that involve technology skills, such as game design clubs or hackathons (Soyoof et al., 2021). Using gameplay in the undergraduate learning process can be an effective way to engage students and enhance their technology skills in a fun and interactive way (Al-Obaydi et al., 2023b; Papadakis et al., 2020).

Gameplay usage in the undergraduate learning process, specifically in the context of DGBL, can be a highly effective and engaging method for enhancing language learning outcomes (Dashtestani, 2022). However, the current distrust and lack of academic interest in DGBL among teacher candidates may stem from a lack of proper training in utilizing games as educational tools. Let's explore this topic in detail.

Firstly, gameplay usage in the undergraduate learning process can offer several benefits. Games can provide an immersive and interactive environment that allows students to practice language skills in a meaningful context. Through gameplay, students can engage in various language tasks, such as listening, speaking, reading, and writing, in a fun and enjoyable way, which can increase their motivation and engagement in the learning process (Al-Obaydi & Pikhart, 2022; Jiang et al., 2022).

Games also provide opportunities for students to develop critical thinking, problem-solving, and decision-making skills as they navigate through the challenges and obstacles presented in the game. Additionally, games often include social elements, such as multiplayer options, which can promote communication and collaboration skills as students interact with their peers to achieve shared goals (Belda-Medina, 2021; Raygan & Moradkhani, 2022).

Furthermore, DGBL can be easily adapted to different proficiency levels, allowing for personalized learning experiences. Games can be designed with different levels of difficulty and complexity, providing appropriate challenges for learners at different language proficiency levels. This flexibility allows educators to tailor the gameplay experience to the needs and abilities of their students, ensuring that the learning process is appropriately challenging and engaging.

However, the current distrust and lack of academic interest in DGBL among teacher candidates may be partly attributed to the lack of proper training in utilizing games as educational tools. Many educators may not be familiar with the pedagogical principles underlying DGBL or may not have received adequate training on how to effectively integrate games into their language teaching practice.

To address this issue, it is important to provide teacher candidates with comprehensive training in DGBL. This can include professional development programs, workshops, and courses that focus on the pedagogical aspects of incorporating games into language learning. Teacher candidates should be exposed to a variety of DGBL platforms and games and given opportunities to practice using them in their language teaching contexts (Tawafak et al., 2023).

Additionally, it is important to provide teacher candidates with guidance on how to effectively integrate games into the curriculum, aligning gameplay activities with specific learning objectives, and designing appropriate assessment methods to evaluate student learning outcomes. Teacher candidates should also be encouraged to critically evaluate and select games that are pedagogically sound and align with the language learning goals of their students.

Furthermore, it is crucial to foster a positive attitude towards DGBL among teacher candidates by promoting awareness of the benefits of using games in language learning, dispelling misconceptions and addressing concerns. Educators should also be encouraged to experiment with DGBL in their own teaching practice and share their experiences and successes with their peers.

In conclusion, gameplay usage in the undergraduate learning process, particularly in DGBL, can be a powerful tool for enhancing language learning outcomes (Tawafak et al., 2019). However, the current distrust and lack of academic interest among teacher candidates may be partially attributed to a lack of proper training in utilizing games as educational tools. Providing comprehensive training and support to teacher candidates in effectively integrating games into language teaching practice can help overcome this issue and promote the effective use of DGBL in language education.

### Gameplay Environment in Educational Sector

The use of gameplay in the educational sector can have a number of positive effects. Here are a few examples:

1. Improved engagement and motivation: Gameplay can be a highly engaging and motivating way to learn, which can lead to improved learning outcomes (Yu et al., 2021).
2. Enhanced problem-solving and critical thinking skills: Many games require players to solve problems and think critically in order to progress, which can help students develop these important skills.
3. Greater collaboration and communication: Some games require players to work together and communicate in order to succeed, which can help students develop these important skills.
4. Enhanced technology skills: Gameplay can be an effective way to teach and reinforce technology skills, as it provides students with the opportunity to practice and apply their knowledge in a fun and interactive way (Alam, 2022). Incorporating gameplay in education can positively impact students' learning and skill development.

### Impact of Gameplay on Language Skills Development

Digital gameplay has gained significant attention as a potential tool for LSD, particularly in EFL contexts. This literature review focuses on the impact of gameplay on LSD in the specific contexts of the Czech Republic and Iraq and explores the existing literature that has used the technology acceptance model (TAM) to investigate the effectiveness of DGBL.

Several studies have been conducted in the Czech Republic to explore the impact of gameplay on LSD. For instance, a study by Novak et al. (2017) used TAM to examine the acceptance and effectiveness of a vocabulary-focused mobile game among Czech EFL learners. The study found that the integration of gameplay in language learning positively influenced students' attitudes, PU, and BI to use the game, resulting in improved language skills.

Similarly, in the context of Iraq, a study by Akram et al. (2019) investigated the impact of a digital game on the language learning motivation and performance of Iraqi EFL learners using TAM. The results revealed that the integration of gameplay significantly enhanced students' motivation and language performance, supporting the effectiveness of DGBL in language learning contexts.

Furthermore, a meta-analysis by Al-Jarrah and Ismail (2018) reviewed the impact of DGBL on language learning outcomes across various countries, including the Czech Republic and Iraq. The findings indicated that DGBL was effective in improving language skills, including listening, speaking, reading, and writing, and positively influenced students' motivation and engagement.

Overall, the literature suggests that gameplay can have a positive impact on LSD in the contexts of the Czech Republic and Iraq, as supported by previous studies using TAM. The integration of DGBL in language classrooms can enhance students' motivation, engagement, and language performance, contributing to effective language learning outcomes. However, further research is needed to explore the nuances of DGBL implementation in different cultural and educational contexts and investigate the long-term impact on LSD (De Wilde & Eyckmans, 2017). As a result, the culture of digital games can serve as a bridge between spoken and written English. Instead than focusing on social customs, certain cognitive processes crucial to the growth of reading and writing abilities are highlighted. This includes the abilities needed for reading on a digital device, where navigation through the text involves not only phonemic skills but also more sophisticated visual and spatial abilities due to the multimodal nature of such reading (Donati et al., 2021; Jang et al., 2021; Leonhardt & Overå, 2021) have examined the effects of gaming on a number of L2 acquisition factors, including cognitive skills, psychological status, creativity, social interaction, isolation, and communicative proficiency, and skill development.

Gameplay can provide students with the opportunity to practice their language skills in a more immersive and authentic context. For example, students who play language-based games or role-playing games may have the opportunity to practice speaking and listening skills in a more naturalistic setting. Overall, it seems that gameplay can be an effective tool for enhancing students' language skills, particularly when it is used as part of a broader language learning program. In this context, it is reported that Most contemporary research on vocabulary retention, learners' recall of novel lexical items, retention of target language vocabulary, and unintentional quick acquisition has produced significant findings that may be applied to L2 learning (Derakhshan, 2021). A gaming application, according to Yoon (2014), could help youngsters learn more effectively because it gives them the ability to practice while also making decisions and receiving feedback from the software.

De Wilde et al. (2020) discovered that although most children significantly improved their language abilities, there were important individual variations. The most useful input sources were speaking, playing video games, and using social media. These types of interactive, multimodal input demand language creation. Also, it was shown that most language competence assessments evaluate the same skills. Online social interaction has the potential to impact LSD in a number of ways. The current study aims to bridge the gap in literature by examining how much digital gaming in English affects game players' processes of incidental acquisition of English as a second language (L2) and by examining various variables in relation to the BIs of these learners who play digital games. To be clear, incidental L2 acquisition refers to the acquisition of a language without the primary goal of doing so through an intentional educational procedure.

### **Important Factor Between EFL and Technology Development Using TAM**

TAM is a widely used framework for understanding the factors that affect an individual's acceptance and adoption of technology. In the context of EFL education, TAM can be used to examine the important factors between EFL and technology development through the use of digital gameplay (Mortazavi et al., 2021). The key factors that influence the acceptance of technology and digital gameplay in EFL classrooms, according to TAM, include PEOU, PU, and attitudes towards technology (Tawafak et al., 2023). These factors can impact the level of TI in EFL classrooms and ultimately affect student behavior intention towards language learning. By investigating the impact of these factors on the integration of technology and digital gameplay in EFL education, this study can provide a comprehensive understanding of the relationship between EFL and technology development and inform the development of more effective and engaging EFL educational programs (Boonmoh et al., 2022).

### **Technology Integration in EFL Through TAM**

TI and EFL can be integrated into TAM in a number of ways (Alfadda & Mahdi, 2021). Here are some steps that could be taken to integrate technology and EFL into TAM:



The impact or relationship between player engagement (PE) and BI in EFL gameplay can be significant. When students are actively engaged and immersed in gameplay, it can enhance their BI to continue using and benefiting from the game in their language learning process (Alfadda & Mahdi, 2021; Sukendro et al., 2020).

PE refers to the level of involvement, enjoyment, and motivation experienced by players during gameplay. In the context of EFL gameplay, this can include elements such as meaningful interactions with the language, opportunities for practice and application of language skills, and a sense of autonomy and control in the learning process. When students are engaged in the gameplay, they are more likely to have a positive attitude towards the game and a higher level of motivation to continue using it (Alemdag et al., 2020; Dos Santos, 2020; Sukendro et al., 2020).

BI refers to the willingness and likelihood of individuals to continue using a particular technology or tool, such as EFL gameplay, in the future. Engaging gameplay experiences can positively influence students' BI to continue using the game as a part of their language learning process (Tawafak et al., 2019; Tuzahra et al., 2021). This can result in higher levels of persistence, motivation, and engagement in language learning activities, which can ultimately lead to improved LSD.

The relationship between PE and BI in EFL gameplay is reciprocal—higher levels of PE can lead to increased BI to continue using the game, and a higher BI can also contribute to increased engagement in the gameplay (Tawafak & Mohammed, 2018). Thus, incorporating engaging gameplay experiences in EFL instruction can positively impact students' BI to continue using the game, leading to more effective language learning outcomes (Tuzahra et al., 2021).

In conclusion, TI and EFL can be integrated into TAM by following a systematic process that involves determining the goals and objectives of the program, identifying the target audience, determining the most appropriate technology to use, developing a detailed plan for the program, implementing the program, and evaluating its impact (Tawafak et al., 2019). By integrating technology and EFL into TAM, organizations can ensure that the program is designed to meet the needs of the students and that it is effective in improving their language skills and behavior intention.

## FACTOR ATTRIBUTES

**Table 1** shows the factor attributes.

**Table 1.** Factor attributes

Factor	Attributes
PU	<ul style="list-style-type: none"> <li>-Ranging beliefs among people on how new technology will impact their learning performance.</li> <li>-Subjective evaluations to gauge the extent to which job performance has improved.</li> <li>-Subjective assessment of student progress in a course.</li> <li>-Notable impact on overall satisfaction.</li> </ul>
PEOU	<ul style="list-style-type: none"> <li>-Effortless.</li> <li>-Skills that can be acquired easily.</li> <li>-User perception that continued usage will require minimal effort.</li> <li>-Positive influence on perceived usefulness.</li> <li>-Noteworthy influence on satisfaction.</li> </ul>
INT	<ul style="list-style-type: none"> <li>-Optimize the learning process.</li> <li>-Foster communication among teachers, students, and peers.</li> <li>-Empower students with confidence and proficiency in utilizing e-learning platforms.</li> <li>-Promote peer learning from experienced students.</li> </ul>
TI	<ul style="list-style-type: none"> <li>-Integrity of communication tools as a form of interaction among group members.</li> <li>-Utilization of electronic materials such as PowerPoint slides, files, and videos.</li> <li>-Familiarity with transitioning between different technologies.</li> </ul>
BI	<ul style="list-style-type: none"> <li>-Positive influence on knowledge development.</li> <li>-Perceived usefulness influencing student behavior</li> <li>-Positive impact on the usage of system portal.</li> <li>-Positive effect on enhancing academic performance.</li> </ul>

**Table 1 (Continued).** Factor attributes

Factor	Attributes
Attitude	<ul style="list-style-type: none"> <li>-Positivity: An attitude characterized by optimism, a positive outlook, &amp; an inclination towards seeing good in situations and people.</li> <li>-Open-mindedness: An attitude marked by receptiveness to new ideas, perspectives, &amp; experiences, &amp; a willingness to consider different viewpoints without bias or prejudice.</li> <li>-Resilience: An attitude characterized by the ability to bounce back from setbacks, persevere in the face of challenges, &amp; maintain a positive attitude despite difficulties or obstacles.</li> </ul>
OSI	<ul style="list-style-type: none"> <li>-Connectivity: OSI involves the ability to establish and maintain connections with others through digital platforms, fostering relationships and building communities across various online channels.</li> <li>-Adaptability: OSI requires the ability to adapt to different communication styles, technological tools, and social norms in the digital realm, as online interactions can differ from traditional face-to-face interactions.</li> <li>-Digital Literacy: Successful OSI requires proficiency in navigating and effectively utilizing various digital platforms, tools, and technologies for communication, collaboration, and networking, as well as understanding online etiquette and safety practices.</li> </ul>
Time played	<ul style="list-style-type: none"> <li>-Skill development: Through repeated engagement &amp; practice, individuals can improve their physical, cognitive, &amp; social skills, such as hand-eye coordination, problem-solving, teamwork, &amp; strategic thinking.</li> <li>-Stress relief: Engaging in play and leisure activities can help reduce stress and promote relaxation. Taking time out of a busy schedule to engage in enjoyable activities can help individuals relax, unwind, and recharge, leading to improved mental and emotional well-being.</li> </ul>
LSD	<ul style="list-style-type: none"> <li>-Communication: This includes development of speaking, listening, reading, &amp; writing skills, as well as ability to understand &amp; interpret different forms of communication like verbal, written, &amp; non-verbal cues.</li> <li>-Fluency refers to ability to express oneself smoothly &amp; effortlessly in a language, with a natural flow of speech or writing.</li> <li>-Cultural competence: Language skill development also encompasses understanding and appreciating the cultural nuances and customs associated with the language being learned. This includes developing cultural awareness, sensitivity, and adaptability, as language is often closely intertwined with culture.</li> </ul>

## METHODOLOGY

### Participants

The survey distributed among 280 participants from two different universities at two countries Iraq and the Czech Republic. The survey link shared through social media network among the researchers' students. The Iraqi participants was higher than Czech participants as 184 followed by 96 in sequence. Age are divided into four categories (18-22, 23-26, 27-30, and above 30), where the highest participants belongs to the first categories (18-22) with (80.2%). Gender are different were, 152 male, and 128 female participated from both countries. According to the usual time used for play, the maximum number of participants pointed to (0-2 hours) with (67.7%) and its significant high compared to the other suggested time for play. There are eight different common games offered to the participants to determine the one that help to improve their language enhancement. PUBG game is the highest game used by students and give (22.7%) of the total ratio of using games daily. **Table 2** shows the demographical analysis of participant personal information and additional information about the digital game preferred, and time spent using it per day.

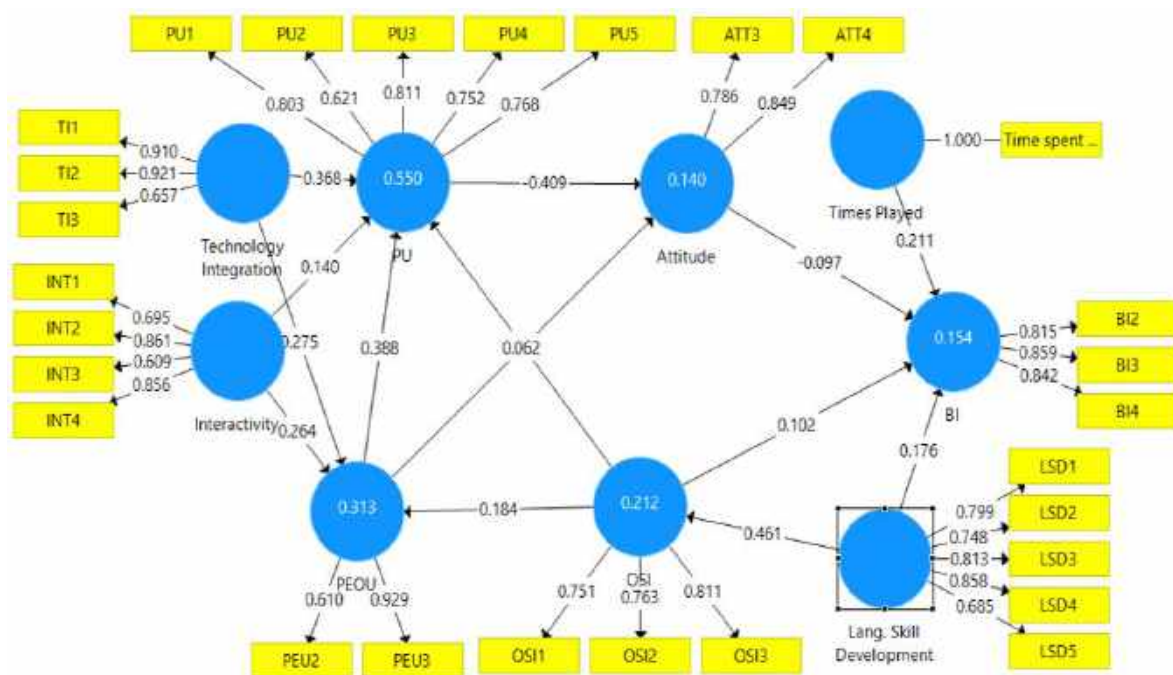
### Instrument

The major instrument of the present investigation was an online survey. The first portion of it was connected to the demographic information like age, gender, country, time spent, and the game played. It aims at collecting basic information about the participants. The other parts of the survey dealt with collecting data about students' PU, PEOU, attitude, BI, and online social intention (OSI). The survey was distributed among university undergraduate students in two countries (Iraq and the Czech Republic) through Google Forms after testing it with pilot administration to know the student acceptance and reliability, which were greater than 0.7. On the other hand, the survey sent to validate by external researchers to check whether the survey is good enough or still need more sections to be tested in this model (Tawafak & Mohammed, 2018). Besides checking the clarity of the language and how it could be understood by the participants, and the link was shared among the participants via social media applications. Before administering the survey to the students in the two countries, the researchers had a discussion with them about the purpose of the study. The researchers obtained the kids' permission after hearing their ideas.



**Table 2.** Demographical information & game played types & time

	Items	Percentage (%)
Total participants	280	100.0
Age	18-22	80.2
	23-26	16.7
	27-30	1.0
	Above 30	2.1
Country	Iraq	65.7 (184)
	Czech Republic	34.2 (96)
Gender	Male	54.2 (152)
	Female	45.8 (128)
Digital game played	Free Fire	11.4
	Minecraft	11.8
	Among Us	12.5
	PUBG	22.7
	Clash Royal	5.7
	Clash of Clans	8.4
	Ludo	12.2
	Fortnite	15.3
Time spent per day	0-2 hours	67.7
	3-5 hours	24.0
	More than five hours	8.3

**Figure 1.** Conceptual research model (Source: Authors)

### Model Conception

**Figure 1** is the conceptual model proposed for this study. This model is derived from the original TAM and an additional factor added to complete the research aim as the model proposed by (Tawafak et al., 2018). Moreover, this model added the factors that related to learning English language using game-based learning as times played and LSD. TAM that is used in the present study, is a model that explains how individuals adopt and use technology proposed by Davis et al. (1989) and has since become one of the most widely used models in the field of information systems.

The original factors used with TAM includes PU and PEOU. These two independent factors refer, PU refers to the degree to which a person believes that using a technology will enhance their job performance. PEOU refers to the degree to which a person believes that using a technology will be free of effort (Alfadda & Mahdi, 2021; Tawafak et al., 2021).

**Table 3.** Path coefficients

	ATT	BI	INT	LSD	OSI	PEOU	PU	TI	TP
Attitude (ATT)		0.097							
Behavioral intention (BI)									
Interactivity (INT)						0.264	0.140		
Language skills development (LSD)		0.176			0.461				
Online social intention (OSI)		0.102				0.184	0.028		
Perceived ease of use (PEOU)	0.062						0.388		
Perceived usefulness (PU)	0.409								
Technology integration (TI)						0.275	0.368		
Times played (TP)		0.211							

**Table 4.** Item loadings

	ATT	BI	INT	LSD	OSI	PEOU	PU	TI	TP
ATT3	0.786								
ATT4	0.849								
BI2		0.815							
BI3		0.859							
BI4		0.842							
INT1			0.695						
INT2			0.861						
INT3			0.609						
INT4			0.856						
LSD1				0.799					
LSD2				0.748					
LSD3				0.813					
LSD4				0.858					
LSD5				0.685					
OSI1					0.751				
OSI2					0.763				
OSI3					0.811				
PEOU3						0.610			
PEOU4						0.929			
PU1							0.803		
PU2							0.621		
PU3							0.811		
PU4							0.752		
PU5							0.768		
TI1								0.910	
TI2								0.921	
TI3								0.657	
TP									1.000

**Table 5.** R<sup>2</sup> values

	R <sup>2</sup>	Remarks
Perceived usefulness (PU)	0.313	Accepted
Perceived ease of use (PEOU)	0.550	Highly accepted
Attitude (ATT)	0.140	Weak accepted
Behavioral intention (BI)	0.154	Weak accepted
Online social intention (OSI)	0.212	Accepted

This research combined an active factor proposed by Tawafak et al. (2018), as TI and interactivity (INT). Another two factors collected from models designed for testing EFL effectiveness as LSD, and OSI.

**Table 3** shows path coefficients while **Table 4** shows the item loading value for each question used in the survey. The item loading can be accepted if its more than 0.6, and its significant result and impact when its item loading be above 0.7.

The proposed model excluded items that have loading with less values and kept only the active items that can indicate to improve a positive R<sup>2</sup> results, as shown in **Table 5**.

**Table 6.** Discriminant validity

	ATT	BI	INT	LSD	OSI	PEOU	PU	TI	TP
ATT	0.818								
BI	-0.174	0.839							
INT	-0.195	0.425	0.763						
LSD	-0.189	0.291	0.609	0.783					
OSI	-0.107	0.240	0.401	0.461	0.775				
PEOU	-0.195	0.438	0.467	0.556	0.363	0.786			
PU	-0.370	0.452	0.596	0.406	0.313	0.614	0.754		
TI	-0.095	0.309	0.467	0.449	0.266	0.447	0.516	0.838	
TP	-0.159	0.291	0.211	0.240	0.217	0.030	0.173	0.206	1.000

**Table 7.** Construct reliability & validity

	Cronbach's alpha	rho-A	Composite reliability (CR)	Average variance rollability (AVR)
ATT	0.751	0.849	0.839	0.717
BI	0.709	0.817	0.802	0.670
INT	0.789	0.791	0.877	0.703
LSD	0.751	0.773	0.845	0.582
OSI	0.843	0.862	0.887	0.613
PEOU	0.772	0.780	0.819	0.601
PU	0.808	0.818	0.756	0.617
TI	0.783	0.849	0.874	0.703
TP	1.000	1.000	1.000	1.000

**Table 4** shows the item load value of each item question in the survey. The values can be accepted if the item loading was greater than 0.7, while values of less than 0.5 could be considered as no effect to the given questions.

**Table 5** show the  $R^2$  values of the tested model, PEOU factor has the highest results as (0.550) which indicate to highly accepted value, while PU factor shows (0.313), this is an accepted value. However, the other three factors show weak acceptance score as a result, but still can be accepted positively as a total model construction.

Discriminant validity refers to the degree to which a measure or construct differentiates between two or more theoretically distinct constructs. In other words, it is a measure of the extent to which a construct or measurement instrument is different from other constructs or instruments that it should not be related to.

**Table 6** shows the discriminant validity of the items used in the model and the strength of the item contrast used in each field. The validity is accepted if the diagonal line of the factor values is equal or greater than 0.7 and all the other values in the lower triangle are less than 0.7. The results of **Table 5** show a significant result among all the factors and their item of contrasts included in each factor.

**Table 7** shows the reliability and validity results for each factor. According to Cronbach's alpha, the reliability is accepted if the value is equal to or greater than 0.7. Rho-A value is accepted if the value is greater than 0.7 for all the factors given in the model (Alfadda & Mahdi, 2021).

Composite reliability (CR) value is accepted if the value is greater than 0.7 for all the factors given in the model. According to the research model factors, all the values are well accepted in the model design diagram (Al-Okaily et al., 2020).

Average variance rollability (AVR) is accepted if the value is greater than 0.5 for all the tested factors. According to the research model factors, all the values are well accepted in the model design diagram.

## DISCUSSION

This study tries to answer these research questions based on the model results:

1. How does an individual's motivation to learn technology skills through gameplay in English language impact their BI to do so?

The use of gameplay in technology skill acquisition has become increasingly popular in recent years, as it provides an interactive and engaging way for individuals to learn. In the present study, INT item load was high

enough in most of the items and above 0.7. Therefore, the motivation to learn through technology in the English language can impact an individual's BI to do so in several ways as with (Al-Obaydi & Pikhart, 2022; Gozcu & Caganaga, 2016; Jiang et al., 2022). Even with TI the items load values in the model were higher than 0.7

Firstly, motivation plays a significant role in determining an individual's willingness to engage in the learning process. If an individual is motivated to learn technology skills through gameplay, they are more likely to have a positive attitude towards the learning experience, and as a result, are more likely to continue to engage in the learning process. Secondly, gameplay can provide a sense of achievement and progress, which can further motivate an individual to continue learning. By providing feedback on performance and progress, gameplay can help individuals develop a sense of competence and mastery, which can further fuel their motivation to learn (Loes, 2022).

Overall, the use of gameplay in technology skill acquisition can be an effective way to motivate individuals to learn and improve their language skills. By leveraging the power of gameplay, individuals can develop the necessary technology skills while having fun, which can lead to greater engagement, motivation, and intention to continue learning.

2. Does an individual's PU of using gameplay in English to enhance their technology skills impact their BI to do so?

An individual's PU of using gameplay to enhance their technology skills can impact their BI to engage in the learning process. If an individual perceives that using gameplay is an effective and efficient way to learn technology skills, they are more likely to have a positive attitude (0.097) towards the learning experience and are more likely to engage in it. PU can increase an individual's confidence in their ability to learn technology skills, which can further motivate them to continue learning. Therefore, PU shows  $R^2$  with (0.313) of using gameplay can be a crucial factor in shaping an individual's BI (0.097) to engage in the learning process and improve their technology skills.

3. How does an individual's PEOU of using gameplay in English to enhance their technology skills impact their BI to do so?

An individual's PEOU (0.550) of using gameplay to enhance their technology skills can also impact their BI (0.154) as  $R^2$  value to engage in the learning process. If an individual perceives that using gameplay is easy and intuitive, they are more likely to feel comfortable with the learning process, and therefore, are more likely to engage in it (Almulla, 2020). PEOU can also reduce the barriers to entry, making it easier for individuals to start learning technology skills through gameplay. Therefore, PEOU of using gameplay can be an important factor in shaping an individual's BI to engage in the learning process and improve their technology skills. The highest impact in this model came with PEOU value were  $R^2$  equal to (0.550).

4. Does an individual's attitude towards using gameplay in English to enhance their technology skills impact their BI to do so?

This study shows weak acceptance score of attitude, but still can be accepted positively as a total model construction. An individual's attitude towards using gameplay in English to enhance their technology skills can significantly impact their BI to engage in the learning process (Leonhardt & Overå, 2021). If an individual has a positive attitude towards using gameplay to learn technology skills, they are more likely to see it as an enjoyable and beneficial experience, which can further motivate them to engage in the learning process. On the other hand, if an individual has a negative attitude towards using gameplay, they are less likely to be motivated to engage in the learning process (Alam, 2022). Therefore, an individual's attitude towards using gameplay can be a critical factor in shaping their BI to engage in the learning process and improve their technology skills.

5. How does the social factor impact on individual's BI to use gameplay to enhance their technology skills?

The social factor can impact an individual's BI to use gameplay to enhance their technology skills. Social influence its  $Q^2$  value (0.212), such as the perception of social norms, can impact an individual's attitude towards using gameplay for learning (Tawafak et al., 2019). For instance, if an individual perceives that their peers approve of using gameplay for learning, they are more likely to have a positive attitude towards it and

engage in the learning process. Therefore, social influence can be a significant factor in shaping an individual's BI to use gameplay to enhance their technology skills.

In conclusion, it is clear that developing technology skills plays a crucial role in motivating and encouraging learners for more engagement in language learning. Learning a language via digital games and other technological applications needs a balance between working on technological skills, which in turn can increase students' motivation to learn and then increase their BI. On the other hand, it requires LSD, which can go naturally in the way of extracurricular activities, such as digital gaming out of school time. The results of this study can provide valuable insights for educators and researchers on the potential benefits of using digital gameplay in language teaching and learning and inform the development of more effective and engaging EFL educational programs.

## CONCLUSIONS

The findings described above reveal that if technology skills, in this case, gamification skills, are effectively integrated into L2 classroom, it can have several positive effects on language learning outcomes. Students consider using digital games in learning L2 useful and therefore also motivating and engaging since these games provide them with opportunities to practice and apply their language skills in an authentic and meaningful context. Thus, the integration of gamification skills can help students develop their language proficiency and improve their confidence in using L2.

In conclusion, the integration of technology and digital games in L2 classrooms can be highly effective in promoting language learning outcomes. However, several factors must be considered to ensure the successful integration of digital gameplay into lessons. These include access to technology, teacher training because teachers are the most vulnerable group in this respect, which consequently may affect the choice of digital games, and their effective use in lesson plans. When these factors are considered, digital gameplay can provide an engaging and effective tool for language learning in L2 classrooms.

## Recommendations and Limitations

This study come with two recommendations:

1. Conduct further research with diverse populations: To strengthen the generalizability of the findings, future research could consider including a more diverse sample of EFL college students from different cultural and linguistic backgrounds. This could help to determine if the observed effects of TI and digital gameplay on behavior intention are consistent across different populations and provide a more robust understanding of the potential benefits of using digital gameplay for enhancing behavior intention in EFL contexts.
2. Explore long-term effects and practical implementation: Future research could also investigate the long-term effects of TI and digital gameplay on behavior intention in EFL college students. This could involve longitudinal studies that assess behavior intention over an extended period of time to determine if the effects are sustained over time. Additionally, further research could explore practical implementation strategies for integrating digital gameplay into EFL curricula, including considerations such as optimal frequency, duration, and types of digital gameplay, as well as potential challenges and barriers to implementation (Tawafak & Mohammed, 2018). This could provide valuable insights for educators and policymakers on how to integrate digital gameplay effectively and sustainably into EFL instruction to enhance behavior intention among college students.

One potential limitation of the present study could be the generalizability of findings. The study may focus solely on EFL college students, which could limit the applicability of the results to other populations, such as students at different educational levels or those studying different languages. The findings may not be transferable to other contexts, such as different cultural or linguistic backgrounds, which may impact behavior intention in relation to TI and digital gameplay differently. Therefore, the external validity of the study's findings may be limited, and caution should be exercised when applying the results to other populations or contexts.

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