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INTENTION TO EMPLOY GAMIFICATION WITH E-LEARNING STUDENTS IN VIETNAM

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ABSTRACT

Gamification for E-Learning is gaining popularity among students across the globe. Gamification for E-Learning provides numerous learning opportunities for students and numerous benefits for instructors in Vietnam. Not only reducing tedium during the learning process, but also assisting students in developing their self-study abilities. E-Learning has become a popular option for all educational institutions, particularly after the COVID-19 pandemic. The purpose of this study is not only to determine the students' intention to use Gamification for E-Learning, but also to investigate the factors that influence that intention using the technology acceptance model (TAM). In addition, gender is included as a moderating variable in this model when variables are interconnected. A method of sampling based on subjective criteria is used to collect data. Afterward, the model was evaluated using PLS-SEM. In conclusion, both theory and practice will benefit from this study's findings in the field of gamification for e-learning.

Keywords: gamification, e-learning, TAM, Vietnam

1. Introduction

Today, with the development of the Internet and electronic devices, learning becomes too easy when it is not necessary to have books, newspapers or go to school every day at schools or educational centers to continue acquire new knowledge (Phua et al., 2012). The Internet helps a lot when possessing a large amount of information, and shortening the search process is also the reason why it has become so popular (Feng et al., 2023). Gamification is a term that appeared in 2002 (Xu et al., 2017). It describes the integration of games into non-game applications to increase the fun of the application. Along with that development, many gamifications integrated learning applications have been created to increase the interest of students in the learning process, called Gamification for E-learning. In general, Gamification for E-learning refers to the problem of gamification of online learning methods to be easily accessible and suitable for the

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majority of young people today (Behl et al., 2022). Due to the COVID-19 pandemic, many of the classes became online from one day to the next. The discouragement of the students increased in this period due to the lack of interaction with classmates and long theoretical and little practical classes (M.A. Benitz, L.C. Jeznach, S.M. Conrad). To improve their motivation was one of the goals for the upcoming courses because of this. Motivation is one of the biggest obstacles a lecturer encounters when it comes to teaching. Personal decision to engage in an activity demonstrates motivation, which also dictates the level of effort and persistence in that activity (R. Garris, R. Ahlers, J.E. Driskell). The hybrid classes, consisting of two online and three in-person days, were offered again the following year. Gamification didn't begin to increase motivation until the school year 2021–2022 (Aldalur & Perez, 2023). Gamification is defined by Kapp as "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems" (K.M.Kapp). Even though gamification for e-learning has several advantages, few students and professors in Vietnam use it (Phuong, 2020). Most are still the old teaching methods.

According to the Marketing AI newspaper, Gamification for E-Learning statistics for the period 2021-2025. Game features will be integrated or provided as an add-on to the LMS - online training management system (LươngHạnh, 2021). From 2019 to 2024, game-based learning in higher education will increase by 15.4% (Metaari, 2019). Gamification has an element of educational challenge that increases student achievement by 34.75% (ScienceDirect, 2020). The academic performance of students educated with challenging gamification increased by 89.45% compared to students who received only regular lectures (ScienceDirect, 2020). According to 67% of students, gamified learning is more inspiring and engaging than standard classes (Intuition, 2019). One of the 10 essential components of a learning management system is gamification (ProProfs, 2021).Gamification is defined by researchers as the integration of game elements into non-game contexts (Hanus and Fox 2015; Kuo and Chuang 2016).

In this study, we assessed university students between the ages of 18 and 22 in Vietnam. Young people will easily access and use Gamification for E-Learning the most. Increase the fun and excitement of learning. Gamification makes learning more fun and engaging by using game elements like scores, leaderboards, and rewards. This creates a positive, motivating learning environment and helps employees automate the learning process. In addition, gamification for e-learning also increases the interaction and connection between class members and helps the class become more diverse and flexible. Understanding this problem, this study has two main purposes. The first is the level of intent to use Gamification for E-Learning. The second key point is whether to expect the theory of technology acceptance model (TAM) influence intention to use Gamification for E-Learning. TAM believes that actual usage is connected by individuals' attitudes towards use technology and establish two key factors for the use of the system:

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perception perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). TAM model is considered as a factor affecting students' intention to use Gamification for E-learning(Rejali et al., 2023).

2. Literature review and Hypothesis development

2.1 Gamification

In order to increase engagement, gamification involves integrating game concepts into nongame environments, such as a website, online community, learning management system, or company intranet. Gamification aims to engage customers, staff, and partners to encourage cooperation, sharing, and interaction (biworldwide.com).From 2000-2009 “Gamification" was born, took the first steps of development, was widely used, and then the term "gamification" became popular. From 2010-2018 Gamification became explosive, in-depth research on Gamification took place. "gamification" also goes through "dead" phases. however, it still went viral and was sought after by those who realized its potential. Currently, gamification is developing very strongly (Đại Anh, 2023).

Gamification is said to be one of the campaigns that attracts the most customers with the aim to increase engagement, access to the web as well as the application and brand through the gamu (SO9, 2022). Figures show that in 2012, the total number of My Reward users was about 4.5 million. Cards alone account for $3 billion in revenue each year (My Starbucks Reward, 2012). Known as one of the sportswear brands. Nike launched the app in January 2012. The data shows that the number of app downloaders increased, along with many people following a more active and healthier lifestyle (Nike, Fuelband News, 2012). Launching the application in 2012, Domino has clearly shown that marketing from gamification has brought huge revenue for businesses:30% increase in sales in the campaign**;** From the application 7,059,325 million pizzas have been baked**;** The number of downloads increased with 328,610 times;Create jobs for many people with 800 people looking for work at Domino's pizza shops near home (Domino pizza, 2012).For E-Learning, Gamification enhancing the learning experience, better learning environment, instant feedback so learners get a clear picture of their level and what they need to improve, behavior change, serving many needs (OES Learning). Research on online 3D gamification for teaching shows that: Most students have demonstrated low motivation when engage in traditional learning methods. Additionally, students have difficulty diligently on the course content, being easily distracted by their smartphones (Chih-Hung Chung, You Yin Ling, 2022). As technology advances enable more digitized learning environments to produce interactive and engaging learning experiences, the trend of gamification in online education has increased (Souha Bennani, Ahmed Maalel, Henda Ben Ghezala, 2021).

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2.2 E-Learning

E-learning first debuted in October 1999 at the International Conference on CBT- Computer Based Training. E-learning is a cutting-edge approach to teaching and learning that relies on a networked computer system. Through this platform, teachers and students can engage, communicate, and share resources and lesson ideas without physically meeting. The E-learning system supports devices that users can use. Internet access via a device like a computer, tablet, or smartphone. Understanding astrophysics, which is dry, through graphic movies or streaming video is much more exciting than studying about the esoteric sciences of the cosmos, black holes, or the genesis of planets in books. The audiovisual teaching approach creates a structured learning environment, according to psychology with the highly effective cooperation of teachers and students. E-learning is important in education because it allows participants and teachers to both gain enhanced learning skills. This is crucial at this moment, when competition is rising and the world is also rapidly developing (economictimes.indiatimes.com, lucidplot.com).

In 2020, more than 20 million students and teachers at all levels in Vietnam were unable to continue direct instruction because to the COVID-19 pandemic. As a result, all academic institutions use online learning (Hoa, 2021). E-learning at the time provided a solution to the issue of keeping students and teachers safe while studying and teaching. E-learning's effectiveness cannot be disputed. However, there are a lot of issues with online learning as well (Li et al., 2022). Students frequently get lethargic and lose interest in learning. Lack of direct engagement with instructors could be the cause (Hsu et al., 2023). Gamification therefore has a significant impact on boosting students' motivation to participate in class and overcoming their lethargy in the online learning process (Behl et al., 2022).

2.3 Theory of Technology Acceptance Model (TAM)

The TAM – Technology Acceptance Model is derived from the Theory of Reasoned Action model – TRA(Natasia et al., 2022). The original TAM consists of 5 constucts which are perceived ease of use (PEOU), behavioral intention to use (BI), attitude towards using (ATU), perceived usefulness (PU), and the actual system use (AU) (Davis, 1986). The behavioral intent of users of (Thakur & Srivastava, 2014) was defined by using factors such as usefulness, social influence, ease of use, personal innovativeness, facilitating conditions, perceived risk, and adoption readiness in order to use Gamification for E-Learning. (Samuel Muthee Kamunya and Elizaphan M. Maina and Robert O. Oboko) used a technology acceptance model for research on attitudes and behaviors that affect Gamification for E-Learning usage. (Ab. Rahman, R., Ahmad, S. & Hashim, U.R., 2018) used TAM in studying the usage of Kahoot, Quizizz applications. A study on the attitudes and perceptions of Jordanian medical students about E-Learning during the COVID-19 epidemic also used the TAM model to study (Muflih et al., 2021). The model which

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suggested the strongest determinants of user satisfaction and the purpose of using technology perceived usefulness and perceived ease of use.

2.4. Hypothesis

2.4.1 Gamification Perceived Usefulness (GPU)/ Gamification Perceived Ease of Use Items (PEOU)

According to the model, gamification perceived utility (GPU), which is also influenced by gamification ease of use (GEOU), and GEOU are the two elements influencing students' attitudes toward gamification. The degree to which students believe that employing gamification will improve their learning performance is known as GPU, and the degree to which students expect gamification to be effortless is known as GEOU (Ab. Rahman, R., Ahmad, S. & Hashim, U.R.,2018).

H1: Perceived usefulness has positive significant impact on Attitude towards using a Gamification For E-Learning.

H2: Perceived ease of use has positive significant impact on Attitude towards using a Gamification For E-Learning.

2.4.2 Skill Engagement (SKE) Interaction Engagement (IE)

The approach suggested that students' attitudes about gamification would affect how engaged they were with the class in terms of their skill or participation/interaction. As a result of the increased engagement throughout the lecture, the students' performance on the tests will also improve. If educators think that gamification would boost students' participation in the lesson, they will also incorporate it into their lesson plans (Ab. Rahman, R., Ahmad, S. & Hashim, U.R.,2018).

H3:Students' attitude towards using gamification technology has a positive influence on the Skill Engagement.

H4:Students' attitude towards using gamification technology has a positive influence on Participation/Interaction Engagement.

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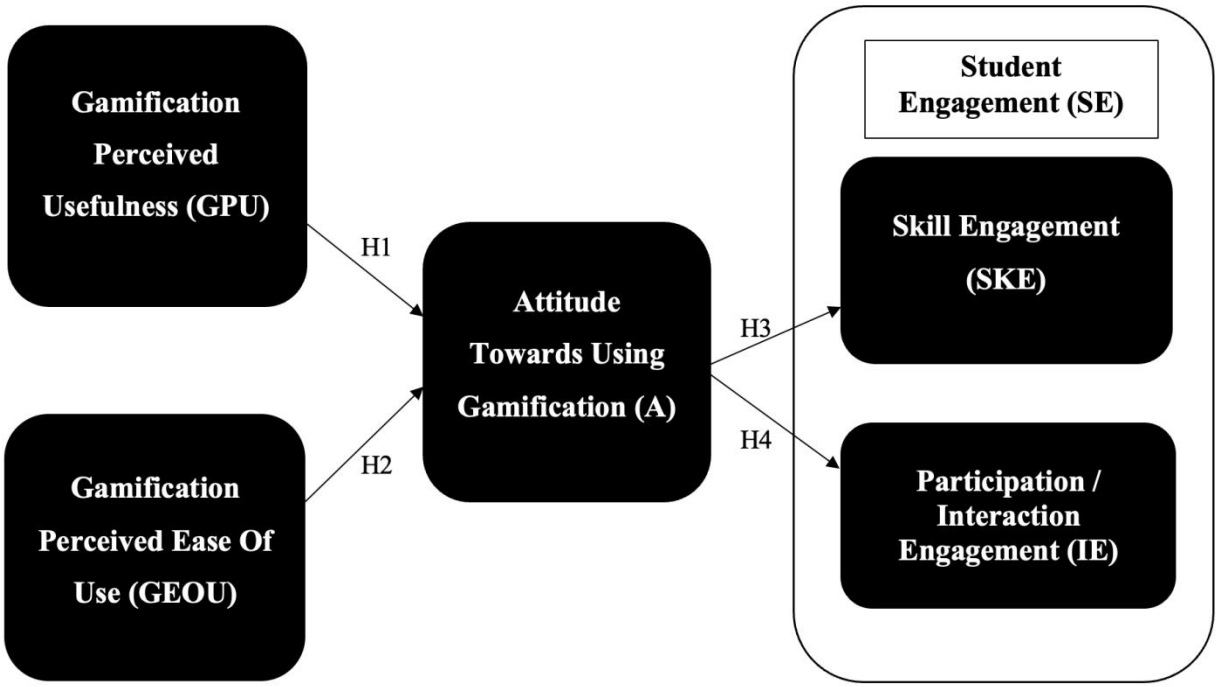

Figure 1. Research model

3. Methodology

3.1 Sampling Method

The survey yielded 172 responses. Of which, there are 172 usable answers. So feedback rate accounts for 100%.To get 172 respondents, the study surveyed participants with (1) criteria as students on universities and colleges using electronic device willing and accepting to survey. The study applied the method of purposeful sampling (Judgemental Sample).Research on Physician's perception of E-consultation adoption amd of COVID-19 pandemic (Dash & Sahoo, 2021).. Judgmental sampling was also employed in research on the effects of challenge-based gamification on online learning (Legaki et al., 2020).This method is based on suitable subjects for the study. Students were selected as research subjects for the following reasons: students are likely to easily access Gamification for E-Learning. As calculated by G-Power3 recommended minimum sample size is 77. The following settings were made in the calculator:

- Anticipated effect size - 0.3 (Dutot, 2015)
- Desired statistical power level - 0.8 (Cohen, 1988)

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- Significance probability level - 0.05 (Fisher, 1925)

In view of these, the sample size of this study, 172 is considered sufficient.

3.2 Questionnaire Design

All the questionnaire's items were taken from earlier research and adjusted to better fit this study's goals (Ab Rahman et al., 2018). Finally, for respondents who did not speak English, the questionnaire was composed in English and translated back into Vietnamese. In addition, the poll used a seven-level Likert scale (from 1 for "completely disagree" to 7 for "completely agree") for each topic to better understand how participants felt about gamification for e-learning (Joshi et al., 2015). In more detail, a self-created questionnaire was used to collect the respondents' main data. Their genders, study year, and major are covered by the demographic questionnaire. The scales from which the survey's items were derived were deemed reliable and valid in earlier studies. Minor adjustments were made to the scale's phrasing to make it more applicable to gamification for e-learning setting. “Gamification Perceived Usefulness (GPU)”, “Gamification Perceived Ease of Use (GEOU)”, “Participation/Interaction Engagement (IE)” and “Student Engagement (SE)” encompassed 4 questions. “Attitude Towards Using Gamification (A)”, “Skill Engagement (SKE)”. Totaling 21 inquiries. The options for rating the responses on a seven-point Likert scale ranged from "not at all agree" to "extremely agree."

Figure 2. Questionnaire design

Constructs	Measurement Items	Sources
Gamification Perceived Usefulness Items (GPU)	PU1 Using the online gamification system improves my E-learning performance (Zoom, Google Meet, Microsoft Team,…)	(Ab. Rahman et al., 2018a)
	PU2 Using the online gamification system increases my E-learning outcome (Zoom, Google Meet, Microsoft Team,…)	
	PU3 Using the online gamification system enhances my desire to produce desired result in my E-learning (Zoom,	

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	Google Meet, Microsoft Team,…)	
	PU4 Using the online gamification system is useful in my E-learning (Zoom, Google Meet, Microsoft Team,…)	
Gamification Perceived Ease of Use Items (PEOU)	PEOU1 I find the online gamification system to be flexible to be used Zoom, Google Meet, Microsoft Team,…	(Ab. Rahman et al., 2018a)
	PEOU2 The online gamification functionality and interface is clear and understandable	
	PEOU3 Interacting with the online gamification system does not require a lot of my mental effort	
	PEOU4 Overall, I believe that the online gamification system is easy to use	
Attitude Towards Using Gamification (A)	A1 I think that using online gamification system is a good idea	(Ab. Rahman et al., 2018a)
	A2 I like learning with online gamification	
	A3 I look forward to those aspects of my E-learning that require the use of online gamification system	
Skill Engagement	SE1 Taking good notes in classroom	(Ab. Rahman et al., 2018a)
	SE2 Listening carefully in classroom	

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(SKE)	SE3 Making sure to study on regular basis	
Interaction Engagement (IE)	IE1 Having fun in the classroom	(Ab. Rahman et al., 2018a)
	IE2 Participating actively in small-group	
	IE3 Helping fellow students	
	IE4 Asking questions when I did not understand the lecturer	

3.3 Analysis Method

The PLS (Partial Least Square - PLS) was used to evaluate the research structure (see Figure 1). According to Chan et al. (2010), Lee et al. (2013), Ringle et al. (2005), Venkatesh et al. (2012), partial least squares is a methodology used to assess and build a structural model for the study of the relationship between ideas (dependent and independent variables). Researchers from a range of disciplines, including organizational behavior, information system management, and strategic management, have used this methodology. Due to some of its advantages, particularly around marketing research on customer satisfaction study.The first PLS is appropriate for investigations with small sample sizes and does not necessitate the illustration of a normal distribution (Aibinu& Al-Lawati, 2010). The second PLS is ideal for the study of prediction models of multidimensional components (Ang et al.,2015). The structural and measurement models can be reanalyzed simultaneously by a third PLS (Hulland, 1999).Thus, even if the issue has a sample size of 172, there are still a lot of observable and latent variables, thus the PLS model method's benefits outweigh these drawbacks and make it the best approach to use in this study.

3.4 Data Analysis

3.4.1 Respondents' profile

The result in figure 3 is 100%. in which female accounted for 43.6%, male accounted for 56.4%. all of them are college students in Vietnam and have used electronic devices.

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Figure 3. Descriptive statistics

Demographic characteristics		Frequency	Percentage
Gender	Male	75	43.6%
	Female	97	56.4%
Academic Year	1	48	27.9%
	2	45	26.2%
	3	48	27.9%
	4	31	18.0%
Major	Business Administration	44	25.6%
	Automotive Engineering Technology	38	22.1%
	Logistics	31	18.0%
	Other Sectors	59	34.3%

3.4.2 Assessing the outer measurement model.

(Henseler et al., 2009) state that the research model is assessed in two stages: First, the signal assessment and worth of the model's measurement concepts are used to evaluate the measurement model. To obtain total reliability, you must specifically ask for reliability (Hulland, 1999), composite reliability (CR) 0.7, and variables with the load factor 0.5 (Figue 4) (Larcker, 1981), the coefficient AVE ≥ 0.5 reached convergent value (Larcker, 1981), coefficient Cronbach's alpha ≥ 0.7 (J. F. Hair et al., 2006). From Figue5, Since the score value accepted is 0.70 or higher, all of the factors have Cronbach's Alpha coefficient values between 0.75 and 0.94, which shows strong reliability (J. F. Hair et al., 2006). Besides that, Figure4 also shows ≥ 0.7 and AVE greater than 0.5 revealed strong evidence of the robustness of the constructs' measures denoted by their internal consistency reliabilities as manifested by their composite reliabilities(Dang et al., 2023; L.-T. Nguyen et al., 2023).

Figure 4. Outer Loadings

	A	IE	PEOU	PU	SKE
A1	0.891				

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A2	0.909				
A3	0.860				
IE1		0.840			
IE2		0.919			
IE3		0.878			
IE4		0.816			
PEOU1			0.898		
PEOU2			0.931		
PEOU3			0.906		
PEOU4			0.849		
PU1				0.876	
PU2				0.920	
PU3				0.931	
PU4				0.870	
SKE1					0.915
SKE2					0.924
SKE3					0.903

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Figure 5. Results on the reliability and convergence value of the scale

	Cronbach's alpha	Composite reliability (Rho_a)	Composite reliability (Rho_c)	Average variance extracted (AVE)
A	0.864	0.867	0.917	0.787
IE	0.887	0.897	0.922	0.746
PEOU	0.918	0.920	0.942	0.803
PU	0.921	0.921	0.944	0.809
SKE	0.902	0.904	0.938	0.835

Discriminant validity (DV) on the other hand was assessed using the traditionally- used (Fornell& Larcker, 1981) procedure. Figure 5shows that DV in which square root of AVE for all constructs on the diagonal was higher than the correlations coefficients with other constructs.The results of Figue 7's cross-loading analysis show that all loadings have a significant load to their respective constructs while having a weak burden to irrelevant ones.

Figure 6. Fornell-Lacker's criterion

	A	IE	PEOU	PU	SKE
A	**0.887**				
IE	0.661	**0.864**			
PEOU	0.757	0.666	**0.896**		
PU	0.776	0.587	0.766	**0.900**	
SKE	0.712	0.701	0.574	0.638	**0.914**

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Figure 7. Cross-Loadings

	A	IE	PEOU	PU	SKE
A1	**0.891**	0.626	0.762	0.694	0.597
A2	**0.909**	0.596	0.664	0.726	0.653
A3	**0.860**	0.532	0.580	0.614	0.649
IE1	0.663	**0.840**	0.618	0.586	0.681
IE2	0.621	**0.919**	0.613	0.517	0.587
IE3	0.510	**0.878**	0.538	0.493	0.622
IE4	0.454	**0.816**	0.516	0.408	0.518
PEOU1	0.648	0.688	**0.898**	0.728	0.569
PEOU2	0.638	0.635	**0.931**	0.697	0.504
PEOU3	0.682	0.551	**0.906**	0.639	0.485
PEOU4	0.748	0.504	**0.849**	0.675	0.462
PU1	0.755	0.537	0.680	**0.876**	0.574
PU2	0.707	0.505	0.654	**0.920**	0.591
PU3	0.661	0.537	0.705	**0.931**	0.541
PU4	0.630	0.530	0.715	**0.870**	0.590
SKE1	0.690	0.616	0.556	0.621	**0.915**
SKE2	0.619	0.614	0.491	0.569	**0.924**
SKE3	0.640	0.695	0.522	0.557	**0.903**

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Figure 8. Hypotheses testing

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
A -> IE	0.664	0.666	0.065	10.273	0.000	Supported
A -> SKE	0.712	0.714	0.055	13.059	0.000	Supported
PEOU -> A	0.420	0.417	0.122	3.430	0.001	Supported
PU -> A	0.449	0.452	0.116	3.873	0.000	Supported

Based on the findings, this model fits the requirements to examine the subsequent phases. After the measurement model is validated, the structural model is the next stage. This includes employing a bootstrapping procedure to measure the direction coefficients and the determination coefficient (R2) of 5000 resamples (J. Hair et al., 2017). Figue8, which evaluates the structural model, provides an indication of the hypothesis testing. The results show that Perceived Usefulness has a positive impact on Attitude towards using Gamification. Therefore, H1 is supported (β = 0.116, p 1= 0.000). Furthermore, Fig 8 also shows that Attitude is also significantly affected by Perceived Ease Of Use. It follows that H2 is supported (β = 0.122, p = 0.001). Besides, the results also revealed that Attitude had a significant impact on Skill Engagement. Therefore, H3 is supported (β 1⁄4 0.055, p 1⁄4 0.000). Finally, Attitude has a positive effect on Interaction Engagement, so H4 is Supported (β 1⁄4 0.065, p 1⁄4 0.000).The model should thus have at least a minimal degree of explanatory power since the R^2 values should be high enough (Urbach Frederik, 2010). R^2value should be equivalent to or larger than 0.1 order of variance, according to Falk and Miller (1992). The lowest R^2 value in this situation is 0.660, which is a significant number (higher than 0.1)(Dang Quan & Tran Thien, 2021; B. H. T. Nguyen et al., 2023). As a result, it can be adequately explained by a specific endogenous component.

Figure 9: R square

	R-square	R-square adjusted
A	0.665	0.660

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IE	0.441	0.436
SKE	0.507	0.503

4. Discussion Result

4.1 Perceived Usefulness and Perceived Ease of Use has an impact on attitudes towards using Gamification for E-Learning.

The results of the study showed that gamification perceived usefulness (GPU) and perceived ease of use (GEOU) had a substantial favorable influence on attitudes toward using it for e-learning (A). Teng (2014) claims that it has been proven that GPU directly enhances A. Additionally, a lot of studies like the one (mentioned) have backed up GPU's viewpoint on A. That is, when the perception of usefulness is more positive, the students' attitude towards using Gamification for E-Learning should also be positive. In fact, usefulness has a direct impact on students' attitudes. For example, students using handheld computers to prioritize calculation, or teachers using electronic devices to teach… This case is the use of Gamification in E-Learning teaching. According to the survey results, up to 65.8% of students think that Gamification completely improves their E-Learning effectiveness and up to 74.4% of students think that Gamification for E-Learning is an idea. good. This further clarifies the influence of GPU on A.Similarly, GEOU will positively affect A. That is, as GEOU increases, A will also increase. For example, student work will be more interested in gamification rather than regular homework sites. This is an element that needs to be monitored and developed by the online education industry.

4.2 Attitudes Towards Using Gamification for E-Learning has an impact on Student Engagement.

According to research findings, students' intention to participate (Skill Engagement and Interaction Engagement) is favorably influenced by their attitude (A) toward implementing gamification in online learning. This finding is similar with other studies (Ab. Rahman et al., 2018b). As a result, the attitude of the student has a significant impact on their willingness to engage in gamification for e-learning. From that, it follows that attitudes of students should be considered in online education. The education industry needs to keep a careful eye on this factor. For Vietnamese students, intention to use is strongly influenced by attitude. they will want to use it more when they like it and expect to get good learning results after using it. It may be the right direction if the developer focuses on the student's attitude factor in developing Gamification for E-Learning.

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5. Implication

5.1 Theoretical Implication

First, this study points out three elements of Gamification for E-Learning including Perceived Usefulness, Perceived Ease of Use and Attitude Towards Using Gamification for E-Learning. This provides a new perspective for the debate about the effect of Intention to use Gamification for E-Learning. In addition, this study has also added to the understanding of Gamification and E-Learning. Through the study, we find that the intention to use Gamification is influenced by the students' attitude towards it. On the other hand, attitudes towards the use of Gamification are strongly influenced by perceived usefulness and perceived ease of use. Research shows that when students are easily accessible and perceive the usefulness of Gamification for E-Learning, their intention to use it also increases. There have been previous studies showing factors that influence the intention to use Gamification. The results of this study further reinforce that attitude is one of them. Thereby, the research enriches the factors affecting the intention to use Gamification for E-Learning.

5.2 Practical Implication

This study assists educators and developers in understanding the expectations of students regarding gamification for e-learning. Students' attitudes toward the use of Gamification for E-Learning will be influenced by perceived utility and perceived usability. This influences Skill Engagement and Engagement with Skills. In lieu of creating gamification for e-learning that is too difficult to use, only focuses on a subset of students, and is less beneficial to moståstudents, the effectiveness will be very low. Instead, teachers or developers should consider the student's attitude toward the use of Gamification and design it accordingly (useful, simple to comprehend, simple to use...). This facilitates student access to Gamification while enhancing E-Learning outcomes. In addition, students should utilize electronic devices to participate in Gamification for online lessons, which not only enhances their learning outcomes, but also their critical thinking and other skills. Normal lectures are not always available. Gamification provides numerous benefits to the E-Learning environment, which cannot be denied. Gamification will add variety to teachers' curricula, which is highly pertinent in today's technological age. The greatest advantage is that it is not difficult for them to approach and create lectures that incorporate Gamification. In addition, gamification has had several positive effects on students. When gamification is incorporated into e-learning, for example, students' learning efficacy improves. According to the results of a survey of Vietnamese students on Gamification for E-Learning, most responses regarding interactive skills are above average when students learn with gamification incorporation. This indicates an enhancement compared to standard e-learning sessions.

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6. Conclusion and limitations

Students at Ho Chi Minh City University of Pharmacy using electronic devices to learn E-Learning is the focus of this study. Using TAM theory to demonstrate the influence on Gamification adoption intent. The results not only provide theoretical feedback, but also provide students, faculty, and technology developers with crucial information about Gamification. This study investigates the effects of gamification for e-learning on students' perceptions of usefulness, usability, and attitude. The investigation yields three conclusions: (1) Perceived usefulness has a positive effect on attitudes toward the use of gamification for e-learning, (2) Perceived ease of use has a positive effect on attitudes toward the use of gamification for e-learning, and (3) When students have positive attitudes toward gamification, they tend to be more interactive and engaged in e-learning. As with the majority of academic research, this study has limitations. First, since gamification is only one form of instruction, the results of this study cannot be used to evaluate all forms of e-learning instruction. Even if researchers exert a great deal of effort to manage experiment externalities, it is sometimes impossible to completely avoid them. Thirdly, all of the participants in this study are from the same city. The number of survey respondents represents a sizable proportion of Vietnamese students, and the sample size of this survey may be indicative of their behavior. A limited sample size may impose restrictions on data analysis and conclusion drawing. As a result, the findings of this study may not be applicable to all circumstances, as they do not reflect the totality of reality from numerous perspectives. In order to acquire a more convincing and representative sample size, subsequent studies should use a larger sample size. The distinction between application categories is also disregarded. It is possible to conduct additional research to compare the effects of various application categories. In addition, the single focus group is one of the limitations of this investigation. The impact of gamification for e-learning on each learner is distinct due to the diversity of subjects and lecturers' teaching abilities. Therefore, future studies should partition the sample into multiple groups for a more objective perspective and precise survey results. Because there is a lack of time for research and only online surveys are conducted, the degree of certainty is inaccurate, and this study examines only the intent to use gamification for e-learning, not its actual implementation.

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