THE IMPACT OF GAMIFICATION INTENTION TO USE IN E-LEARNING THROUGH STUDENT ATTITUDE: EVIDENCE FROM EGYPTIAN PRIVATE HIGHER EDUCATION INSTITUTIONS (HIES)

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Abstract: *The COVID-19 pandemic has forced many universities to move to online learning to sustain students' education. Today's Students are digital natives. They grew up with digital technologies and have different learning styles, new attitude to the learning process and higher requirements for teaching and learning. Indeed, there is a need to develop new e-learning models that transform education to sustain goals and achieve education's objectives. Modern pedagogical paradigms and trends in education, reinforced by the use of ICT, create prerequisites for use of new approaches and techniques in order to implement active learning. Gamification is one of these trends as applying gamification in a non-gaming environment motivates students and also keeps them engaged in learning. The purpose of this research is to empirically investigate gamification intention to use in E-learning through student attitude in the Egyptian Private Higher Education Institutions (HIEs). This study proposes to integrate the personal characteristics including the dimensions (computer anxiety, enjoyment, self-efficacy) which extends the Technology Acceptance Model (TAM) including dimensions (Perceived usefulness, perceived ease of use). The objectives of this research are: to examine how gamification affects intention to use in E-learning, to identify how gamification affects student's attitude, to investigate how student's attitude affects intention to use gamification. Data in this study came from a survey of 4.3 acceptable responses. the results were analysed employing by Structural Equation Modeling technique (SEM) using Analysis Moment of Structures (AMOS) software. The main conclusions drawn from this study are: the direct effect between gamifications and intention to use gamification in E-learning is statistically significant, the direct effect between gamification and student's attitude towards gamification is statistically significant, the direct effect between student's attitude towards gamification and intention to use gamification in E-learning is statistically significant, and finally, student's attitude mediates the relationship between gamification and intention to use Egyptian higher education institutions.*

Keywords: gamification, Technology Acceptance Model (TAM), student attitude, adoption intention, E-learning, higher education.

1. Introduction

The COVID-19 situation is making us sit, work and learn from home. Many students learn from e-learning platforms and schools have completely transferred their teaching online. E-learning is catching up globally in higher education institutions and students have a positive attitude toward e-learning (Johnson et al., 2021). Mohammed (2022) studied the impact of COVID-19 on online learning for students by collecting web-based data from 20 countries and discovered an increase in time spent online learning, and obtaining more information about new tools and techniques used. E-learning opportunities are enormous since they give multiple advantages such as overcoming educational system differences in time and physical space. (Bates, 2005). Although e-learning has many benefits, it cannot keep students motivated, and motivation is a critical part of any type of learning, including online learning. (Bekele, 2010).

Information and communication technologies (ICT) play a significant role in enhancing students' learning processes, as their effectiveness is determined by the level of acceptance and usage among the student population. (Johnson et al., 2021). It is well acknowledged in numerous types of research that the adoption of the effectiveness of e-learning could significantly improve learning performance, either independently or as a complement to the educational process. (Fokides, 2017). As a result, many educational institutions are moving in this direction and provide as many online courses as possible. (Rajabalee et al., 2017). However, there are still numerous concerns regarding the use of appropriate methods and learning tools to accomplish the desired motivation and commitment of students. (Moghavvemi, 2015). A massive array of various digital learning tools has therefore been implemented and evaluated in various learning environments. These tools increase engagement, motivation, achievement, time, and retention while simultaneously enhancing personal learning and thinking skills. (Abrahim, 2019). Additionally, it can improve the quality of teaching and increase digital literacy. (Krasna and Bratina, 2012). In recent years, the systematic use of gamification has evolved into a widely used learning instrument that has been integrated into various information systems. This activity is also reflected in the continued development of research involved in the study of the gamification phenomenon, which focuses primarily on designing learning modules and learning activities during the e-learning procedure. (Varannai et al., 2017). The primary objective of gamification in education is to increase the motivation and engagement of students to enhance their abilities when engaging in e-learning. (Koivisto and Hamari, 2019). In this context, the use of gamification in educational environments can be an effective solution and demonstrate that the user is capable of producing the desired results. (Fokides et al., 2019). So far, there are a variety of previous studies about (e-learning) technology acceptance of learners. These studies adapted in popular models and theories such as TAM Technology Acceptance Model (Davis, 1989), Technology Acceptance Model 2 (TAM2) (Venkatesh & Davis, 2000) and Technology Acceptance Model 3 (TAM3) (Venkatesh and Bala, 2008). Theory of Reasonable Action (TRA) (Ajzen and Fisbein, 1980), Theory of Planned Behavior (TPB) (Ajzen,1985), Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) and show the user attitude of using technology in the presence of different factors. These factors, such as learner characteristics or system characteristics, influence the acceptance of technology. Using external factors, numerous models can be unified and further extended in this context. "Computer self-efficacy," "computer anxiety," "prior experience," "enjoyment," "learning motivation," "perceived learnability," "Hedonic Motivation," "personal innovativeness," and "student engagement" are some of the models that have been demonstrated to influence user e-learning acceptance. (Esteban-Millat et al., 2018; Wu and Chen 2017). Everyone, regardless of age, enjoys playing games. Consequently, gamification is utilised not only in gaming contexts, but also in non-gaming contexts, such as learning. It provides a "graceful experience" when games can be applied to nongaming contexts. (Deterding et al., 2011). Landers (2014) proposed a theory of gamified e-learning, in which the study suggested that gamification influences behaviour/attitudes towards learning. In the form of mediation, these learning-related behaviours and attitudes mediate the relationship between instructional or content quality and outcomes and learning directly. Accordingly, the present paper tends to investigate gamification intention to use in E-learning through student attitude in the Egyptian Private higher Education Institutions (HIEs).

2. Gamification in the Education Sector

Gamification in the education sector refers to the utilization of various gaming elements and gaming experiences during learning procedures (Alshammari, 2020). Gamification has been designed to promote learning in a variety of ways as well as academic areas. The key idea here is the fact that it is feasible to include gaming techniques within the context of a learning procedure in order to engage learners productively and in such a wonderful way (Annansingh, 2018). Gamification of learning is a significant current topic that is still developing in research. (Hassan et al., 2019). There is growing evidence that gamified learning is widely recognized as a useful teaching tool for creating attractive learning environments (Saleem et al., 2021). Many studies have investigated gamified learning systems in both classroom and online contexts (Landers and Armstrong, 2017). Some have used gamification plug-in-like Moodle or Blackboard (Hew et al., 2016) others have integrated customized applications for gamification (Van Roy and Zaman, 2018). The most studied elements of gamification are leadership boards (Kuo and Chuang, 2016) and badges (Kyewski and Krämer, 2018). Some studies found detrimental effects (Hanus and Fox, 2015), while others found that gamification may increase knowledge and competence (Domnguez et al., 2013). Gamification is also thought to influence motivation and engagement levels, however it is essential to choose the right gamification element. (van Roy and Zaman, 2018). Subhash and Cudney (2018) conducted a systematic literature review for gamified learning in higher education and found little research work on gamified learning in the engineering profession. They observed various advantages of gamified learning, including higher levels of engagement, motivation, and attitude, which leads to improved performance. In addition, their study demonstrated the relevance of points, badges, leadership boards, levels, feedback, and graphics in higher education. According to a qualitative study performed by Saleem et al., (2021), gamification is a widely utilized tool to create an engaging environment for learning, and popular gamification elements employed are points, badges, levels, and leadership boards. (Annansingh., 2018) reported that, using gamification techniques in online learning is unique and separate from teaching on a face-to-face learning model, where the instructor can manage and organize the students more efficiently. Online learning tools or platforms, such as Learning Management Systems (LMS), play an essential role in gamification development. (Zaric et al., 2017). Today, there are several LMS solutions with gamification elements on the market (Hassan et al., 2019). The most used is Moodle. It is a well-known open-source LMS that is utilized successfully to offer online learning by instructors throughout the world (Annansingh, 2018). There is a need for experience in integrating such elements into the available course requirements, despite the fact that Moodle offers a variety of capabilities that help in gamification in learning. Moodle's most popular game component in the complete application of gamification is the digital badge, but other add-on software tools use other game aspects. (Hassan et al., 2019). Furthermore, only a few studies have attempted to survey user perceptions of game aspects in Moodle. Thus far, only one study has alluded to the reward of digital badges as an important idea and concept in e-learning where there has been no notable standard grading system (Alshammari, 2020).

2.1 Theoretical Foundation

In any research work, the hypotheses an empirical study should be based on previous theories as well as well-established models as highlighted by (Colquitt and Zapata-Phelan, 2007). The present research predicts students' attitudes and behavioral intentions as outlined by TAM (Davis et al., 1989). TAM is known as an adaptation from theory of reasoned action (TRA) (Ajzen & Fishbein, 2000) for predicting IS adoption (Davis et al., 1989). According to Davis et al (1989), TAM advocates that PU and PEOU of any information system or technology determine the users' intention. The element in TAM is presented. From the present study's context, PU connotes how the students find it useful to adopt gamification method, while PEOU implies how much the students consider using gamification to be effortless. Meanwhile, attitude stipulates the students' positive or negative belief or evaluation towards adopting the gamification method. Intention signifies the likelihood that a student is going to accept gamification. Nonetheless, TAM was first received with a variety of objections from previous professionals (Ajibade, 2018). There are also suggestions from previous studies that there is a need to expand the current socio-psychological theory, such as TAM, by adding new constructs in certain settings, such as those described by (Perugini and Bagozzi, 2001). For instance, it is necessary to incorporate individual difference variable into the model to recognize the psychological processes in a person's perception of a technology's value. Based on this

argument, this study proposes to integrate the personal characteristics in order to extend the TAM. By integrating both of the TAM and personal characteristics, this study is able to distinguish individual differences prior to technological advances. This information is useful to discern the users' psychological process prior to their technology acceptance, also known to be a complex and long journey (Lin et al., 2007).

2.2 Technology Acceptance Model (TAM)

Davis (1989) developed the TAM, which is the most widely used paradigm for analyzing technology usage and acceptability. (Veiga et al., 2001). PU and PEOU are the two key variables in the model. PU describes the instrumental dimension of technology usage, whereas PEOU describes hedonic pleasure. (Tarhini et al., 2017). Other researchers have incorporated new dimensions to TAM (Warkentin et al., 2002) to explore individuals' adoption of e-government across various countries by taking trust, perceived risk, culture, and perceived behavior control into account. Many researchers have used TAM for e-learning, and PEOU and PU have been connected to user intentions (Liu et al., 2009). The stronger the learners' PEOU and PU, the more likely they are to be satisfied, have a positive attitude towards e-learning, and have the ability to utilize it. (Arbaugh and Duray, 2002).

Perceived Usefulness (PU) is defined as the degree of belief that the use of a system improves performance (Davis, 1989). As e-learning improves the flexibility of time and space and learning at their own pace, it increases PU among users. E-learning also helps in collaborating and sharing knowledge as it connects the learner to other similar groups (Su-Houn Liu, 2009).

Perceived Ease of Use (**PEOU**) influences students' intention to learn through e-learning, as it also affects PU and perceived enjoyment (Lee et al., 2005). According to Gong et al. (2004), PEOU is directly related to students' attitudes and PU. Many studies have explored the application of TAM to explain students' acceptance of e-learning tools (Tarhini et al., 2014; Hwang et al., 2012). Sharma et al. (2014) showed that PEOU directly affects the intention to use a system and other researchers have supported this claim (Chang and Tung, 2008; Liu et al., 2010; Tarhini et al., 2013).

2.3 Personal characteristics and e-learning (Extended TAM)

Computer anxiety deals with a lack of motivation or intention to use a system as a result of anxiety caused by the use of a computer, which hinders the completion of tasks using a computer (Igbaria and Parasuraman, 1989). Sievert et al. (1988) defined computer anxiety as "subjective responses or feelings generated while using computers." These feelings may include uneasiness, fear, and apprehensiveness towards the usage of a computer now or in the near future. Computer anxiety will undoubtedly have an impact on e-learning satisfaction and intention to use it in the future.

Enjoyment Refers to the degree of pleasure a person perceives when completing a task using technology, without bothering the outcome of the performance. Enjoyment can be considered intrinsic motivation, according to Venkatesh and Speier (2000). Intrinsic motivation is characterized as an activity motivated by positive feelings and genuine interest (Deci et al., 1999).

Self-efficacy is determined by the belief that a person has the ability to employ motivation and cognitive resources to decide the best course of action to manage a given situation (Wood and Bandura, 1989). According to Bandura (1986), self-efficacy is related to the judgement and belief that one possesses the right skills to complete a task rather than the skills necessary to complete the task. Bandura (1986) defines self-efficacy as "the amount of effort, degree of perseverance, and path taken to achieve success in a difficult task." Self-efficacy becomes very relevant in system utilization to motivate intention to use (Hwang and Yi, 2003; Venkatesh and Davis, 2000). Venkatesh (2000) suggested in their research that self-efficacy and enjoyment can be determined by ease of use. Hwang and Yi (2003) demonstrated that self-efficacy metrics can have a significant effect on enjoyment.

2.4 Student Attitude Toward Using a System

Attitude is a key part of e-learning, and it is critical to understand what drives attitudes towards e-learning. As a result, it is critical to employ a multidisciplinary strategy to comprehend attitudes towards e-learning. (Liaw,

2007). There is a need to create a tool that assesses attitudes by studying different aspects of the user. (Wang, 2003). TAM emphasized the strong relationship between behavioral attitudes towards using a particular technology and intention to utilize it. The degree to which a student feels a good or negative feeling related to gamified learning environments may be characterized by their attitude towards using gamified learning environments. A previous study discovered that attitude had a strong influence on the intention of using technology. (Teo and Zhou,2019). It has been observed in the context of educational gamification that behavioral attitudes towards using gamification were an excellent indicator of intention to utilize it. (Panagiotarou et al., 2020). Another study on the use of online education in crises discovered that behavioral attitudes affect the intention to utilize online education positively (Wang et al, 2021).

2.5 Adoption Intention for using e-learning

The importance of attitude in e-learning and knowing what The usage of any e-learning module determines its success. (Esterhuyse et al., 2016; Mohammadi, 2015). Research has looked at aspects that improve the experience of using a given technology in the future. (Chu and Chen, 2016; Cheung and Vogel, 2013). Many variables influence behavioral intentions for technology usage, including the usefulness of technology (Jacques et al., 2009), openness to experience, subjective norms (Schepers and Wetzels, 2007), and feeling of enjoyment (Wang et al., 2012). Behavioral intention in TAM is a very essential component to examine since it impacts the usage of technology and individual readiness to complete a certain activity. Both PEOU and PU have an indirect influence on technology usage and user behavior. Many e-learning research studies have verified behavioral intention and usage relationships (Chang and Tung, 2008; Liu et al., 2010; Park, 2009; Tarhini et al., 2015).
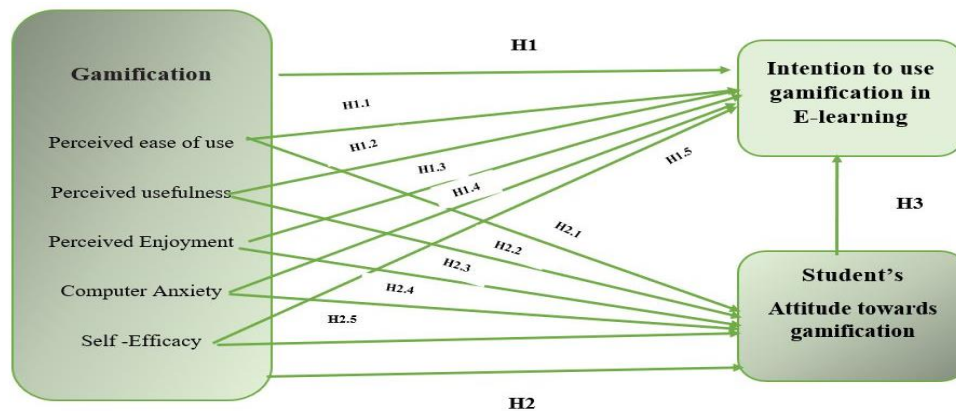
3.Conceptual Framework

Figure 1. Conceptual Framework

Source: Author's estimations.

4.Operational Definitions

Table 1. Operational Definition

Variable	Measurement Scale
Independent: Gamification	Ahmad and Hashim (2018); Esterhuyse et al. (2016); de Kok and Klaiber (2022)
Mediator: Student's Attitude towards gamification	Ahmad and Hashim (2018)
Dependent: Intention to use gamification in E-learning	Esterhuyse et al., (2016) and de Kok and Klaiber (2022).

Source: Author's estimations.

5. Research Methodology

For the purpose of this research, the research population refers Egyptian private higher education institutions. The research questionnaire was administered to seven hundred (700) respondents, 441 questionnaires representing 63% were returned, and 38 questionnaires representing 5.4% were incomplete or ineligible or

refusals and 259 (37%) were not reached. There were 403 acceptable responses, a response rate 57.6%, which is highly adequate for the nature of this study. In this Research Paper, the Amos software package was used to perform the structural equation modelling (SEM) to investigate the inter-relationships between the constructs of the hypothesized model. Hypotheses Testing Following a confirmatory factor analysis, the valuation of the structural model through testing of the hypotheses underlying the research model is conducted.

6. Results and Findings

The Average Variances Extracted (AVE) should always bove 0.50 (Hair et al., 2019). AVE of the particular constructs (Perceived Usefulness = 0.837, Perceived Ease of Use =0.560, Self-Efficacy=0.524, Perceived Enjoyment = 0.739, Computer Anxiety = 0.581, Student's Attitude towards gamification = 0.743 and Intention to use gamification in E-learning= 0.747) are more than 0.500. Overall, these measurement results are satisfactory and suggest that it is appropriate to proceed with the evaluation of the structural model. Composite Reliability (CR) is used to measure the reliability of a construct in the measurement model. CR of (Perceived Usefulness = 0.852, Perceived Ease of Use =0.828, Self-Efficacy=0.777, Perceived Enjoyment = 0.918, Computer Anxiety = 0.542, Student's Attitude towards gamification = 0.896 and Intention to use gamification in E-learning= 0.936). So, it clearly identified that in measurement model all construct have good reliability.

Measurement model Results: The 7 factor was subjected to CFA using the AMOS software. DF was 329 (it should be more than 0), χ^2/DF has a value of 2.419, that is less than 3.0 (it should be less than or equal 3.0). The RMSEA was .055 (it should be less than 0.08). The TLI index was .939 which is very close to 1.0 (a value of 1.0 indicates perfect fit). The CFI was .947. All indices are close to a value of 1.0 in CFA, indicating that the measurement models provide good support for the factor structure determined through the CFA. **Structural model summary**: Results of structural' model using AMOS software, shows that DF was 334)it should be more than 0), χ^2/DF has a value of 2.648, that is less than 3.0 (it should be less than or equal 3.0). The RMSEA was .059 (it should be less than 0.08). The TLI index was .930 which is very close to 1.0 (a value of 1.0 indicates perfect fit). The CFI was .938. All indices are close to a value of 1.0 in CFA, indicating that the measurement models provide good support for the factor structure determined through the CFA.
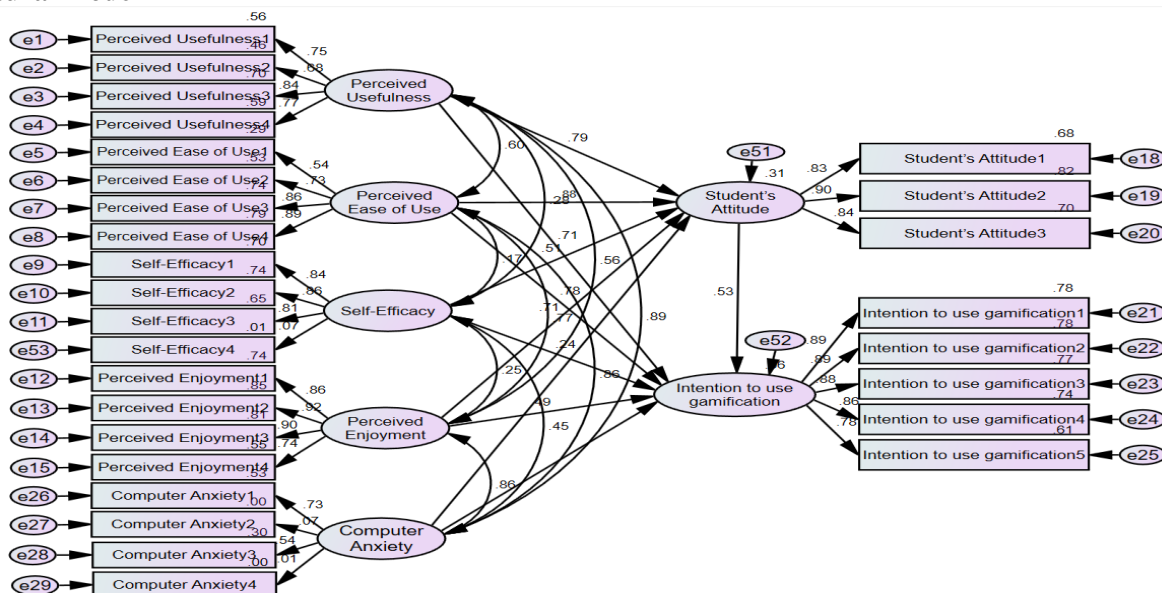
Structural model

Figure 2. Structural Model (Final Result)

Source: Author's estimations.

7. Discussion

This research study aimed at investigate gamification intention to use in E-learning through student attitude in the Egyptian Private Higher Education Institutions (HIEs). this study proposes to integrate the personal charactristics including the dimensions (computer anxiety, enjoyment, self-efficacy) which extends the TAM including dimensions (Perceived usefulness, perceived ease of use).

The Direct Effect

Due to the individual tests of significance of the relationship between the variables. It reveals that, as expected, a relationship between Perceived Usefulness and Intention to use gamification in E-learning ($\beta = 0.714$, CR (Critical Ratio) = 13.065, CR > 1.96, p = 0.000, p<0.05). Therefore, (**H1.1:** Perceived usefulness has an impact on Intention to use in E-learning in Egyptian higher education institutions) is supported. **H1.2:** Perceived ease of use has an impact on Intention to use in E-learning in Egyptian higher education institutions. ($\beta = 0.783$, CR (Critical Ratio) = 22.052, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Perceived Ease of Use and Intention to use gamification in E-learning ". PEOU is directly related to students' attitudes and PU. Many studies have explored the application of TAM to explain students' acceptance of e-learning tools (Tarhini et al., 2014; Hwang et al., 2012). **H1.3:** Self -Efficacy has an impact on Intention to use in E-learning in Egyptian higher education institutions. ($\beta = 0.244$, CR (Critical Ratio) = 3.051, CR > 1.96, p = 0.020, p<0.05). is supported, as it predicts that " There is a relationship between Self-Efficacy and Intention to use gamification in E-learning ". This result is consistent with (Hwang and Yi, 2003; Venkatesh and Davis, 2000) who stated that self-efficacy is the amount of effort, degree of perseverance and path taken to achieve success in a difficult task and it becomes very relevant in system usage to drive intention to use. **H1.4:** Perceived Enjoyment has an impact on Intention to use in E-learning in Egyptian higher education institutions. ($\beta = 0.485$, CR (Critical Ratio) = 4.445, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Perceived Enjoyment and Intention to use gamification in E-learning". Enjoyment can be considered intrinsic motivation. Intrinsic motivation is characterized as an activity motivated by positive feelings and genuine interest in doing so. (Deci et al., 1999; Speier, 2000). **H1.5:** Computer Anxiety has an impact on Intention to use in E-learning in Egyptian higher education institutions. ($\beta = 0.382$, CR (Critical Ratio) = 9.054, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Computer Anxiety and Intention to use gamification in E-learning ". Computer anxiety deals with a lack of motivation or intention to utilise a system because of computer anxiety, which hinders the completion of tasks using a computer (Igbaria and Parasuraman, 1989). It refers to the subjective responses or feelings generated when using computers (Sievert et al., 1988). These feelings can include uneasiness, fear and apprehensiveness for any computer use in the present or near future. Based on the results, **H1:** "Gamification has an impact on Intention to use in E-learning in Egyptian higher education institutions" is supported. This result is consistent with (Subhash and Cudney, 2018; AlMarshedi et al., 2017; Leaning, 2015) whom emphasized that, gaming elements may motivate and positively drive users' desired behaviour.Moreover, Several studies have demonstrated the effectiveness of gamification elements. It includes virtual points, badges, milestones, levels, awards, leader boards, digital crosswords, puzzles, trophies, and grading points to improve the learning experience of users (Bovermann et al., 2018; Subhash and Cudney, 2018; Kuo and Chuang, 2016). However, Hanus and Fox, (2015) found no impact of including gaming elements in e-learning settings on students' intention to use e-learning. Similarly, Hassan et al., (2021); Saleem et al., (2021); and Koivisto and Hamari, (2019) results showed a significant improvement in students' interest, engagement, motivation, and overall performance by using gamification elements in e-learning platforms, it failed to reduce the drop-out ratio.

Moreover, the result shows that: **H2.1:** Perceived usefulness has an impact on Student's Attitude towards gamification in Egyptian higher education institutions. ($\beta = 0.794$, CR (Critical Ratio) = 14.427, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Perceived Usefulness and Intention to use gamification in E-learning". **H2.2:** Perceived ease of use has an impact on Student's Attitude towards gamification in Egyptian higher education institutions. ($\beta = 0.880$, CR (Critical Ratio) = 18.930, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Perceived Ease of Use and Intention to use gamification in E-learning ". **H2.3:** Self -Efficacy has an impact on Student's Attitude

towards gamification in Egyptian higher education institutions (β = 0.515, CR (Critical Ratio) = 5.477, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Self-Efficacy and Student's Attitude towards gamification ". **H2.4:** Perceived Enjoyment has an impact on Student's Attitude towards gamification in Egyptian higher education institutions. (β = 0.709, CR (Critical Ratio) = 12.869, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Perceived Enjoyment and Student's Attitude towards gamification ". **H2.5:** Computer Anxiety has an impact on Student's Attitude towards gamification in Egyptian higher education institutions. (β = 0.617, CR (Critical Ratio) = 12.812, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that " There is a relationship between Computer Anxiety and Student's Attitude towards gamification". Based on the above results, **H2:** "Gamification has an impact on Student's Attitude towards gamification in Egyptian higher education institutions" is supported. This is consistent with Polat, (2014); Gibson et al., (2015); and Sar and Altun, (2016) who reported that, games encourage students to display a positive attitude and have an impact on achievement. The fact that games have always been a tool that draws people's attention is also noted. Gamification encouraged students, especially shy ones, to actively participate in a course, which has a direct influence on the student's interest in and attitude towards it (Bayat et al., 2014; Karamustafaolu and Kaya, 2013; Uzun, 2012; Bayat et al., 2014; Coşkun et al., 2012; and Demir, 2012). The majority of gamification research in higher education that investigated the perspectives of students was conducted after students were involved in a gamified learning experience (Chou and He, 2017; Denny, 2013; Domnguez et al., 2013; Fotaris et al., 2016; Pettit et al., 2015). Because developing gamified online courses is an expensive undertaking (Bernik et al., 2015).

In addition, the result shows that **H3:** Student's Attitude towards gamification has an impact on Intention to use in Egyptian higher education institutions**.** (β = 0.534, CR (Critical Ratio) = 8.002, CR > 1.96, p = 0.000, p<0.05). is supported, as it predicts that "There is a relationship between Student's Attitude towards gamification and Intention to use gamification in E-learning". This is consistent with Dichev and Dicheva, (2017); Darby et al., (2013) ; and Ramirez and Squire, (2015) who noted that, the participants in the learning process or the students may lose motivation and without this motivation, the learning process cannot be optimized and learning outcomes cannot be attained. The education provider must reignite the student's interest in learning. Moreover, studies related to 'continuance use intention' on product use of e-learning (e.g., Al Amin et al., 2022), Massive Open Online Courses (MOOC) (e.g., Shanshan & Wenfei, 2022), Learning Management Systems (LMS) (e.g., Ashrafi et al., 2022; Widjaja & Widjaja, 2022) and m-learning application (e.g., Khlaif et al., 2022; Tam et al., 2020) were already done; however, studies on continuance use intention mainly on a gamified e-learning is scarce (Roslan et al., 2021a; Wirani et al., 2022), making this a critical literature gap.

The Indirect Effect (Mediation and Moderation)

Findings reveal a statistically significant indirect effect between Perceived Usefulness and Intention to use gamification in E-learning Through Student's Attitude towards gamification (P = 0.005, P<0.05), The results of the mediation effect indicate that there is *partial mediation* effect of the Student's Attitude towards gamification between the relationship of Perceived Usefulness and Intention to use gamification in E-learning. Therefore**,** (**H4.1:** Student's Attitude mediates the relationship between Perceived usefulness and Intention to use Egyptian higher education institutions)is supported. In addition to that, a statistically significant indirect effect between Perceived Ease of Use and Intention to use gamification in E-learning Through Student's Attitude towards gamification (P = 0.003, P<0.05), The results of the mediation effect indicate that there is partial mediation effect of the Student's Attitude towards gamification between the relationship of Perceived Ease of Use and Intention to use gamification in E-learning. Therefore**,** (**H4.2:** Student's Attitude mediates the relationship between Perceived ease of use and Intention to use Egyptian higher education institutions) is supported. Findings also show a statistically significant indirect effect between Self-Efficacy and Intention to use gamification in E-learning Through Student's Attitude towards gamification (P = 0.003, P<0.05), The results of the mediation effect indicate that there is partial mediation effect of the Student's Attitude towards gamification between the relationship of Self-Efficacy and Intention to use gamification in E-learning. Therefore**,** (**H4.3:** Student's Attitude mediates the relationship between Self -Efficacy and Intention to use Egyptian higher education institutions) is supported. Moreover, a statistically significant indirect effect between

Perceived Enjoyment and Intention to use gamification in E-learning Through Student's Attitude towards gamification (P = 0.003, P<0.05), The results of the mediation effect indicate that there is partial mediation effect of the Student's Attitude towards gamification between the relationship of Perceived Enjoyment and Intention to use gamification in E-learning. Therefore**,** (**H4.4:** Student's Attitude mediates the relationship between Perceived Enjoyment and Intention to use Egyptian higher education institutions) is supported. Finally, the results reveal a statistically significant indirect effect between Computer Anxiety and Intention to use gamification in E-learning Through Student's Attitude towards gamification (P = 0.005, P<0.05), The results of the mediation effect indicate that there is partial mediation effect of the Student's Attitude towards gamification between the relationship of Computer Anxiety and Intention to use gamification in E-learning. Therefore**,** (**H4.5:** Student's Attitude mediates the relationship between Computer Anxiety and Intention to use Egyptian higher education institutions) is supported. Based on the above results, (**H4:** Student's Attitude towards gamification *mediates* the relationship between Gamification and Intention to use Egyptian higher education institutions) is supported.

This paper has dual significance both academically and practically. Academically, the current research fills the gap and supplements the literature. The research developed a model contributes knowledge to other models that have recommended expanding the investigative scope using structural equation modelling technique. Therefore, an integrated framework the estimated structural model corroborated the ten hypotheses, as Gamification (Perceived Usefulness, Perceived Ease of Use, Self-Efficacy, Perceived Enjoyment and Computer Anxiety) construct explained 30.8 % of Student's Attitude towards gamification variance (R^2 = 0.308), Besides, Gamification (Perceived Usefulness, Perceived Ease of Use, Self-Efficacy, Perceived Enjoyment and Computer Anxiety) through Student's Attitude towards gamification explained 55.9 % of Intention to use gamification in E-learning variance (R^2 = 0. 559).

Practically, this research highlights the importance of adopting gamification as a novel tool in E-learning in Egypt. Due to the new reality imposed by Covid 19. Education systems based on four key elements teacher, the student, the university, and the curriculum which teaches. Egypt educational institutions face major problems around student motivation and engagement, inability to take out of student talents and abilities, and the fear of an interview that with cynicism. The spirit of seriousness which granted by the school or university, which reduces the incentive for students to go or learn, and curricula depend on conservation and indoctrination. Also, the student not interesting to take online exams after they failed the first time. Gamification offers an opportunity to help educational institutions to solve these problems. Provide insight into how educational institutions can use gamification, to attract students and thereby increase their learning. Also applying the right gamification element to the right user to increase the motivation and participation, skill teachers who use the system, and identify the behaviors to change in the learners. The researcher chooses to private educational institution as they the procedures are less bureaucratic than the public universities and own the facilities to adopt gamification.

8.Limitations and suggestions for future research

The research in this paper has investigated gamification intention to use in E-learning through student attitude in the Egyptian Private Higher Education Institutions (HIEs). The future research needs to be extended to be conducted to other developing countries.

Because this study's sample was limited to one sector the Private Higher Education Institutions, Given the extremely specialized nature of the research context, it is thought that the conclusions will spread across a variety of fields, including the adoption of e-commerce.

One of the limitations of the current research was that the research study was a cross-sectional study and data was collected throughout a specific time frame. Accordingly, if the data were collected longitudinally, one would gain greater insight into the dynamics of the relationship and maybe different deliverables.

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