FACTORS INFLUENCING STUDENT ENGAGEMENT WITH GAME ELEMENTS AMONG UNDERGRADUATE STUDENTS IN SAUDI ARABIA

ALLEHAIDAN AHMED FREEH M

UNIVERSITI SAINS MALAYSIA

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ALLEHAIDAN AHMED FREEH M

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LIST OF ABBREVIATIONS

ATD	Association for Talent Development
ATUT	Attitude Toward Using Technology
AVE	Average Variance Extracted
DOI	Diffusion of Innovations
GBL	Game-Based Learning
HCI	Human-Computer Interaction
HTMT	Heterotrait-Monotrait Ratio
IBL	Inquiry-based learning
IDT	Innovation Diffusion Theory
KSA	Kingdom of Saudi Arabia
MOOCs	Massive Open Online Courses
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SEM-PLS	Structural Equation Modelling - Partial Least Square
TEL	Technology-enhanced learning
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor
WOS	Web of Science

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Appendix A Questionnaire for research on Gamification of Learning: Investigating Student Engagement of Game Elements in Saudi Arabia Higher Education.

FAKTOR-FACTOR MEMPENGARUHI PENGLIBATAN PELAJAR DENGAN ELEMEN PERMAINAN DALAM KALANGAN PELAJAR PRASISWAZAH DI ARAB SAUDI

ABSTRAK

Gamifikasi dan sistem yang digamifikasi telah mendapat perhatian yang ketara dalam penyelidikan kontemporari. Konsep gamifikasi merangkumi pelbagai tafsiran, termasuk penggabungan elemen-elemen seperti permainan ke dalam reka bentuk antara muka pengguna. Walau bagaimanapun, adalah penting untuk diperhatikan bahawa tidak semua contoh gamifikasi terhad kepada produk perisian. Walaupun terdapat peningkatan penyelidikan dalam bidang ini, dimensi-dimensi yang diterokai dalam skop gamifikasi, serta kemajuan semasa dalam penyelidikan gamifikasi, masih belum jelas. Oleh itu, kajian ini bertujuan untuk mengkaji kesan langsung komponen Teori Penerimaan dan Penggunaan Teknologi Bersepadu (UTAUT) (iaitu, jangkaan prestasi, jangkaan usaha, pengaruh sosial, dan keadaan yang memudahkan), STD dan Flow Teori terhadap sikap terhadap penggunaan gamifikasi serta penglibatan pelajar (iaitu, penglibatan kemahiran dan penglibatan peserta). Secara signifikan, kajian ini juga bertujuan untuk meneroka peranan moderasi kepekatan pelajar terhadap hubungan antara sikap terhadap penggunaan gamifikasi dan penglibatan pelajar. Model penyelidikan ini disokong oleh Teori Penerimaan dan Penggunaan Teknologi Bersepadu (UTAUT), teori penentuan kendiri, dan teori aliran bagi memperkukuh hujah kajian. Data dikumpulkan daripada pelajar sarjana muda di universiti awam di Kerajaan Arab Saudi. Model teori diuji menggunakan pemodelan persamaan struktur (SEM) dengan perisian Smart-PLS. Dapatan kajian menunjukkan kesan positif gamifikasi terhadap penglibatan dan motivasi pelajar. Dengan menggabungkan elemen

permainan seperti mata, lencana dan papan pendahulu, persekitaran pembelajaran tergamified berjaya menarik perhatian pelajar dan menggalakkan penyertaan aktif dalam proses pembelajaran. Penemuan seterusnya menunjukkan kepentingan penyesuaian budaya dan penerimaan kandungan pendidikan gamified di Arab Saudi. Apabila elemen gamifikasi disesuaikan untuk selaras dengan nilai dan norma tempatan, guru memerhatikan penerimaan dan semangat yang lebih tinggi dalam kalangan pelajar. Kajian itu menyimpulkan bahawa gamifikasi boleh meningkatkan prestasi, produktiviti, penglibatan dan menggalakkan penyertaan pelajar. Walau bagaimanapun, kajian itu mempunyai sumbangan penting kepada kepraktisan kerana ia akan membantu penggubal dasar, kerajaan dan institusi. Oleh itu, dengan menerima pengalaman pembelajaran gamified, pembuat dasar boleh meningkatkan penglibatan pelajar, memenuhi keperluan pembelajaran yang pelbagai dan memupuk pembangunan kemahiran.

FACTORS INFLUENCING STUDENT ENGAGEMENT WITH GAME ELEMENTS AMONG UNDERGRADUATE STUDENTS IN SAUDI ARABIA

ABSTRACT

Gamification and gamified systems have garnered significant attention in contemporary research. The concept of gamification encompasses various interpretations, including the incorporation of game-like elements into the design of user interfaces. However, it is essential to note that not all instances of gamification are restricted to software products. Despite increased research in the area, the various dimensions explored within the scope of gamification, along with the current advancements in gamification research, remain unclear. Therefore, this research aimed to examine the direct effect of Unified Theory of Acceptance and Use of Technology (UTAUT) components (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions), on the attitude toward using gamification as well as on students' engagement (i.e., skill engagement and participant engagement). Significantly, this study also aimed to investigate the moderating role of students' concentration on the relationship between their attitude toward using gamification and student engagement. The research model was underpinned by the UTAUT, self-determination theory, and flow theory to strengthen the study's argument. Data were gathered from undergraduate students in public universities in the Kingdom of Saudi Arabia. The theoretical model was tested using structural equation modelling (SEM) with the SmartPLS software. The research findings show the positive effect of gamification on student engagement and motivation. By incorporating game elements such as points, badges, and leaderboards, gamified learning environments effectively capture students' attention and encourage active participation in the learning process.

The findings further demonstrated the significance of cultural adaptation and acceptance of gamified educational content in Saudi Arabia. When gamification elements were tailored to align with local values and norms, teachers observed higher acceptance and enthusiasm among students. The study concluded that gamification can improve students' performance, productivity, engagement, and encourage participation. However, the study has a significant contribution to practicality as it will aid policymakers, the government, and institutions. Therefore, by embracing gamified learning experiences, policymakers can enhance student engagement, cater to diverse learning needs, and foster the development of essential skills.

CHAPTER 1

BACKGROUND OF THE STUDY

1.1 Chapter Overview

This chapter discusses the research background and problem statement, from which the research questions and objectives were drawn. The significance of this research is presented, followed by an overview of the research scope and operational definitions.

1.2 Introduction

In higher education, e-learning has become a fundamental component of the student learning experience. Its advantages are increasingly being integrated into traditional campus-based universities (Ellis et al., 2009; Sulistyo et al., 2019; Nikoli et al., 2019). Historically, higher education instruction relies on traditional, teacher-directed pedagogical methods for imparting theoretical and discipline-specific knowledge (Kapp, 2013; Arkorful & Abaidoo, 2015; Fischer & Klieme, 2020; Ayaz et al., 2023). However, many argue that these traditional approaches are inadequate to address the challenges faced by today's generation (Pozo Sánchez et al., 2019; Ankiewicz, 2019). This sentiment applies across all disciplines, including management education, where educators advocate for innovative pedagogies that promote deep student learning (Walder, 2017; Burden et al., 2019). As a result, significant transformations in higher education delivery formats have occurred since the turn of the century.

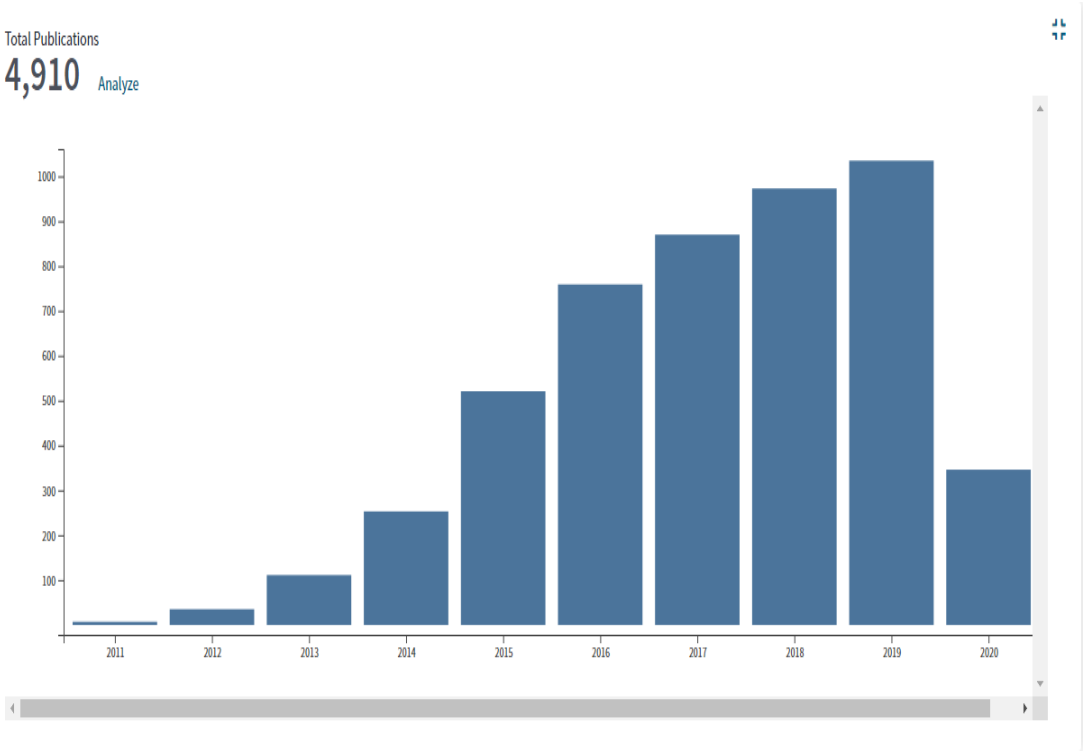
Educators and social scientists have increasingly emphasised the effectiveness of teaching and learning to shift away from traditional teacher-centred approaches toward student-centred methods (Dole et al., 2016; Sun-Lin & Chiou, 2019). Recognising the diversity in students' learning skills and techniques, there has been a push for student- or learner-centred approaches that accommodate varying learning styles. This diversity necessitates the use of multiple instructional strategies to create an inclusive learning environment (McCollough, 2015; Udu, 2018; du Toit-Brits, 2019; Mpwanya & Dockrat, 2020). Moreover, students of the current generation who have grown up in a technology-centric learning environment are believed to have developed neurologically distinct traits compared to previous generations (Byers et al., 2018; Quadir et al., 2019). These students demand educational approaches that leverage modern technology in the classroom. This technological integration has facilitated educators in utilising a wide array of materials and tools for course delivery, particularly within management education (Baylor & Ritchie, 2002; Mohamed & Lamia, 2018; Mora et al., 2020).

Recently, information systems designers have increasingly used game design elements to engage users and enhance their experiences (Liu et al., 2017; Wee & Choong, 2019; Morschheuser et al., 2019). Gamification, broadly defined as applying game elements in non-game contexts (Deterding et al., 2011), has been adopted across diverse fields like education, e-commerce, health, social networking, fitness, and workplace productivity (Subhash & Cudney, 2018; Baptista & Oliveira, 2019; Bai, Hew, & Huang, 2020). This approach aims to influence behaviours and cognitive processes by integrating motivational features, such as those found in games (Huotari & Hamari, 2017). In education, gamification has been utilised across various levels

and subjects to enhance learning outcomes (Seaborn & Fels, 2015; Dichev & Dicheva, 2017; Koivisto & Hamari, 2019).

Gamification has predominantly been utilised in education, with applications extending beyond academia into areas such as language teaching (e.g., Duolingo) and software usage (e.g., Ribbon Hero by Microsoft) (Seaborn & Fels, 2015; Majuri et al., 2018; Koivisto & Hamari, 2019; Toda et al., 2019). Platforms like Kahoot and Quizizz exemplify how gamification can facilitate user engagement across diverse subjects without significant implementation challenges (Rahman et al., 2018; Göksün & Gürsoy, 2019). Despite its widespread use, practical guidelines on integrating gamification features to enhance learning performance, engagement, and interaction in various educational settings remain limited (Koivisto & Hamari, 2019; Howard & Gutworth, 2020). Gamification represents a valuable tool for educators to engage students with diverse learning styles, leveraging digital familiarity to enhance learning effectiveness (Tokac et al., 2019; Nietfeld, 2020). Therefore, this study aimed to examine how game elements foster engagement and interaction among undergraduate students in Saudi Arabian public higher education.

Figure 1.1 illustrates that gamification has received considerable attention in recent years as one of the most valuable methods in the education domain (see the trend of total publications and the cumulative number of times cited per year). This was established through a comprehensive review of past studies using the Web of Science (WOS) database, the most widely recognised and reliable database worldwide. The main keywords used were “gamification” or “gamify*” or “game elements” or “game*” or “game mechanics” to derive the results.



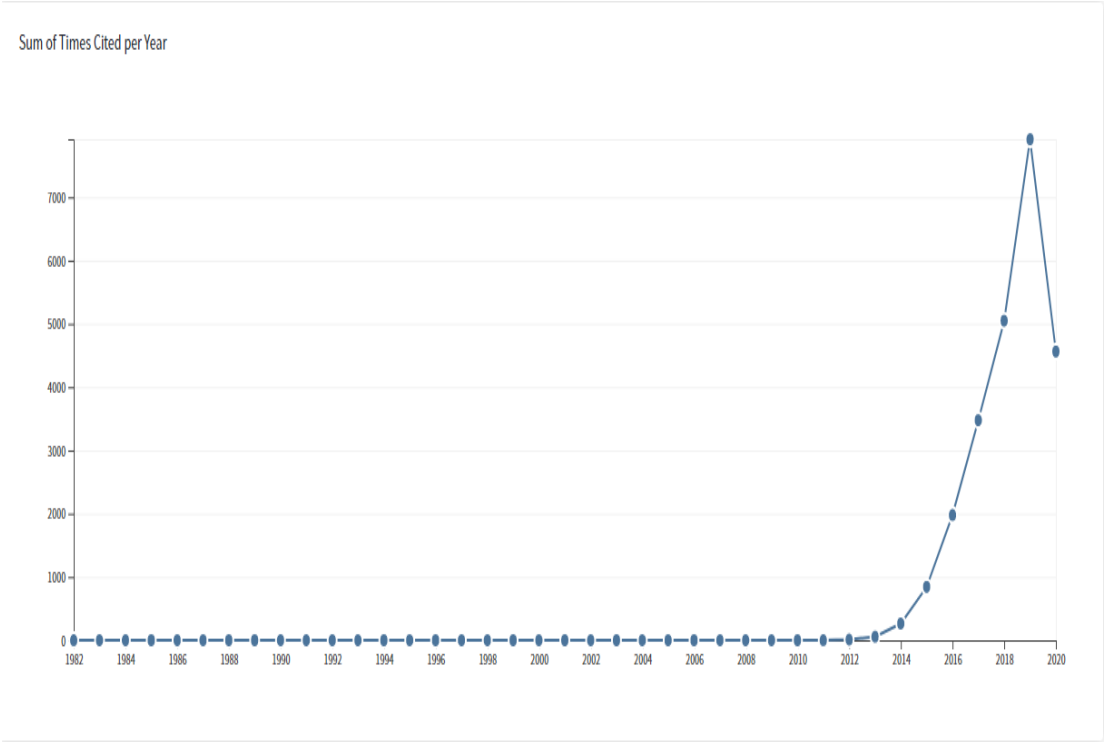


Figure 1.1 Trend of Publications and Sum of Time Cited Per Year

[**Source:** ISI Web of Science (WOS) 2020].

1.3 Scenario of Higher Education in Saudi Arabia

Organisations must adapt to the rapidly changing environment driven by technological advancements and globalisation in the global commercial market. The knowledge-based economy further intensifies these pressures, affecting researchers and practitioners who deal with innovation across diverse institutions (Alharbi, 2016; Bryan & Clegg, 2019; Sharif, 2019). Higher education institutions, in particular, face substantial challenges in enhancing their technological and management capabilities to keep pace with these dynamic trends (Ellis & Childs, 2019).

The higher education sector faces significant challenges in a dynamic environment, characterised by rapid change and increasing demand, drawing considerable attention from academics and practitioners (Sugrue, Englund, Solbrekke, & Fossland, 2018). Institutions must enhance their capabilities to meet these evolving expectations (Pucciarelli & Kaplan, 2016; Hasanefendic et al., 2017). Global enrollment in higher education is expected to rise significantly by 2025, placing pressure on institutions to manage massification effectively (Tierney & Lanford, 2016). This growth necessitates a reevaluation of educational practices in industrialised nations, such as the United States and European Union countries, focusing on aligning educational offerings with labour market demands (Laáková, Bajzková, & Dedze, 2017). To address these challenges, institutions are modernising curricula, enhancing funding strategies, and improving governance to ensure quality education (Laáková et al., 2017). Additionally, there is a growing trend toward innovative delivery methods such as blended learning, massive open online courses (MOOCs), and student-centred e-learning approaches like gamification (Tsay et al., 2018; Putra et al., 2019). These initiatives aim to meet the diverse needs of learners today and prepare graduates for the competitive global workforce.

The Saudi government has acknowledged the need to elevate its higher education system to world-class standards. Additionally, there is a focus on expanding access to higher education in both traditional and emerging disciplines that are crucial to the nation's social and economic development (Smith et al., 2005; Almufareh, 2021). Despite global efforts to reduce dependency on oil for energy, the Kingdom of Saudi Arabia (KSA) currently supplies 60% of the world's oil, a trend that is expected to continue. This has heightened interest among Saudi businesses, organisations, researchers, and students in exploring other strategies and opportunities for the country's economic, social, and political development. These issues are particularly relevant in the increasingly globalised and rapidly evolving corporate landscape (Asiri, 2019; Ghaban, 2021).

Education in KSA is characterised by four key features: an emphasis on Islamic teachings, a highly centralised system governing and supporting education, state-provided funding (resulting in free education at all levels), and a widespread policy of gender segregation. Four central agencies oversee the development of educational policy. The Ministry of Education holds primary responsibility for elementary schools (grades 1-6), intermediate schools (grades 7-9), and male secondary schools (grades 10-12). The General Presidency for Girls' Education is primarily responsible for managing the segregated education of girls and women. The Ministry of Higher Education is mainly responsible for universities. Finally, the General Organisation for Technical Educational Research and Training is primarily responsible for community schools and vocational training (Alkhazim, 2003; David et al., 2017). In line with the social status of women in KSA, Article 155 of the KSA educational system stipulates that males and females should be strictly separated at all levels of education, with the following exceptions: kindergarten, nursery school, certain private primary schools,

and select university medical schools. Except for subjects in physical education and home economics, the curriculum used for male and female education is the same. A large proportion of the curriculum at all levels in KSA is dedicated to religious subjects and the study of Islam, accounting for a significant amount of material and teaching time. Rote learning is the dominant pedagogical method for teaching and learning (Arabkheradmand et al., 2014; Muzaffar et al., 2021).

In response to the complex dynamics of educational funding systems and the evolving supply and demand for academic worldwide, many educational institutions are increasingly focusing on innovation to survive and gain competitive advantages (Egan et al., 2017; Tight, 2019). KSA is actively addressing these challenges by striving to enhance its universities to world-class standards, significantly expanding access to education across various traditional and non-traditional fields crucial for the country's future economic and social development. As the world's leading oil exporter, the Kingdom of Saudi Arabia (KSA) plays a pivotal role in global energy supply, and it is also exploring strategies to reduce its reliance on oil for energy, a priority in international research and policy (Yusuf, 2017; Tong & Baslom, 2019). The country's long-term economic, social, and political prospects are therefore of utmost importance to Saudi businesses, sectors, academics, and students in navigating a rapidly evolving global business environment.

Despite the significant efforts by the Saudi government and the Ministry of Higher Education to elevate Saudi higher education institutions to global standards, a notable gap remains in creative and innovative approaches and outcomes. According to Khayati and Selim (2019), substantial financial investments, which rose from approximately SR 10 billion in 2005 to SR 77.2 billion in 2013, accounting for about 9% of the annual budget, have been made to expand and double the number of

universities. However, mere financial support does not automatically ensure improvements in education quality or foster innovation in the sector. Iqbal and Adnan (2011) highlight that KSA ranks 126th in the Global Innovation Index, indicating relatively low innovation efficiency.

In response, Saudi Vision 2030 aims to transition the economy from oil dependency to a service and knowledge-based economy. Achieving this vision requires a fundamental restructuring and reassessment of how universities deliver services and compete in the global context (Mitchell & Alfuraih, 2018; Al-Qahtani et al., 2024). However, higher education in KSA faces several challenges, as noted by Alharbi (2016), including enhancing research productivity and improving educational quality. These challenges underscore the ongoing need for innovative approaches and strategic reforms to meet the evolving demands of the global knowledge economy.

Institutions that continue to rely on traditional teaching systems and methods face significant challenges in adapting to modern educational demands. The role of the teacher is pivotal in shaping the learning environment and influencing how students engage with knowledge. Traditional teacher-centred approaches view students as passive recipients of information, focusing primarily on exam scores and competition among peers, rather than fostering independent and continuous learning skills (Gulnaz et al., 2015). This approach has been criticised for its limitations in preparing students for the complexities of modern life and a globalised society. Conversely, the shift toward student-centred education emphasises active, participatory learning where students are encouraged to take initiative and engage meaningfully in the learning process. This approach acknowledges the teacher's role in facilitating and supporting students' exploration and expression of knowledge. It promotes independent study skills and nurtures a culture of lifelong learning.

In this evolving educational landscape, there is increasing advocacy for innovative teaching methods and techniques, such as gamification learning, that integrate game elements into educational practices (Bagunaid et al., 2019; Aldiab et al., 2019). These approaches aim to enhance student engagement, motivation, and learning outcomes by making learning more interactive, enjoyable, and relevant to students' experiences and interests. Embracing these innovative approaches requires teachers to redefine their roles within the classroom, moving toward facilitating dynamic and adaptive learning environments that cater to diverse student needs and learning styles.

Saudi universities are actively addressing challenges to improve their performance and enhance educational outcomes (Alharbi, 2016; Bagunaid et al., 2019). Key to this effort is understanding the factors that can mitigate these challenges, particularly in integrating technology effectively. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a prominent model used to facilitate technology adoption by individuals (Samar & Mazuri, 2019; Baishya & Samalia, 2020). Recent studies, such as those by Sulphey (2017), have highlighted the potential of gamification learning to address issues in the higher education sector in KSA. Gamification involves using game elements to enhance engagement and learning outcomes. Sulphey's work recommended specific games suitable for implementation in KSA's educational context. Building on these insights, the current study investigated the direct impact of UTAUT components (performance expectancy, effort expectancy, social influence, and facilitating conditions) on attitudes toward using gamification.

Additionally, it explored how these attitudes influence student engagement, encompassing both skill engagement and participant interaction in gamified learning environments. Notably, the research also examined the moderating role of students'

concentration levels on the relationship between attitude toward gamification and student engagement, explicitly focusing on participant interaction among undergraduate students in Saudi public universities. This study aimed to examine the factors influencing undergraduate student engagement and interaction in the e-learning process across the Saudi higher education context.

1.4 Research Problem

With the continuous emergence of technologies, the integration of gamification into education has gained increased importance (Dehghanzadeh et al., 2019; Bai et al., 2020). In today's world, encouraging and engaging students to learn is one of the most challenging tasks for educators. Earlier research suggests that literature lessons are ineffective, indicating a need for more student-centred and engaging approaches to enhance student engagement and learning outcomes in schools. These inefficiencies emphasise the urgent requirement to investigate student-centred and interactive methods that can improve learning outcomes and student engagement (Chandrasehgaran, 2024). Gamification, which involves incorporating game elements into non-game contexts, such as education, is recognised as an effective teaching strategy (Bicen, 2018). This teaching method is now more widely available due to the proliferation of smart gadgets and online gaming platforms.

One of the primary benefits of gamification in the e-learning process is that students can attend classes remotely and independently with reduced supervision, which also often facilitates asynchronous interactions (Κορίνη, 2021). Studies suggest that gamification enhances engagement and performance by incorporating game elements such as points, badges, and leaderboards, providing students with a sense of achievement (Zahedi et al., 2021).

Regardless of the recognised potential of gamification, there are still arguments over its long-term effectiveness due to the e-learning's distant and unsupervised character, which created unique challenges, including low achievement, interest, competitiveness, enjoyment, and satisfaction, as well as unfavourable views about the process. Moreover, previously mentioned issues among students lead to disengagement in online learning systems (Amo et al., 2020; Romano et al., 2021; Κορίνη, 2021), thus necessitating the crucial need for constructing e-learning courses that will improve student engagement (Behl et al., 2022; Lee et al., 2021).

Some argue that the novelty of gamification may diminish over time, potentially causing user fatigue and raising concerns about its long-term effectiveness in enhancing learners' engagement and performance (Ofosu-Ampong, 2020). Furthermore, there are other initiatives aimed at improving student participation during online classes. These include VR, mobile apps and web-based training. However, they have failed to address the issue thoroughly, thus indicating the need for a better-targeted and context-specific solution (Jayawardena et al., 2021; Obaid et al., 2020).

Nevertheless, gamification has produced ambiguous or biased outcomes in several studies. They discovered that ranking has a variety of effects on women and can have unanticipated adverse effects. For instance, according to Hanus and Fox (2015), gamification not only does not improve outcomes but also lowers motivation and enjoyment. However, some users expressed negative feelings about the badges. Therefore, questions arise about the benefits of using gamification in an educational setting due to the mixed results regarding its effects in learning environments.

Furthermore, studying how gamification components affect students' learning, engagement, participation, and other outcomes is a broad objective. The goal should

be restricted to identifying the aspects of games that work well for a specific student type participating in an activity (Dichev & Dicheva, 2017). Identifying practical game elements to enhance engagement and learning for particular user groups is hindered by the diverse layouts of game elements used in various activities (Smiderle et al., 2020).

In Saudi Arabia's higher education system, for instance, the adoption of gamification has faced several roadblocks. Despite the government's interest in promoting technology integration as a strategy for counteracting the rising student-teacher ratio and low engagement rate (Higgins & Alghamdi, 2015), the implementation of these strategies still faces setbacks due to infrastructural, pedagogical, and attitudinal barriers (Børte et al., 2023). Other factors that hinder student engagement include teacher-centred approaches, lack of motivation, individual differences, digital distractions, and a lack of relevance (Li et al., 2023). Additionally, studies have also suggested that there is a lack of clear understanding among educators of the benefits and practical implications of the gamified learning system in Saudi higher education (Alhasan et al., 2025).

Although many studies have applied the Unified Theory of Acceptance and Use of Technology (UTAUT) in studying technological adoption, however, they have only focused on exploring the relationship between the components of UTAUT and the general attitudes toward gamification, while failing to link these attitudes to tangible student outcomes like engagement and performance (Dečman, 2015; Dwivedi et al., 2020). While student engagement is multifaceted and influenced by cognitive and behavioural aspects, limited studies have investigated how student traits such as concentration affect the correlation between gamification and engagement. Based on the above, therefore, a persistent issue in higher education is the UTAUT elements that

affect the use of gamification in the learning process. According to Alosaimi (2021), there is very little evidence that educators plan to utilise the gamified services offered by any platform. It remains unclear whether teachers intend to utilise gamified services to encourage students to learn. Despite this, there are still constraints on implementing this technology in higher education institutions (Børte et al., 2023), prompting enquiries into the reasons for these limitations and potential strategies for adoption. Thus, little is known about the factors that encourage or discourage students from using gamification in Saudi Higher education (Alhasan et al., 2025).

In academic fields where students often lack natural motivation or interest, such as information systems courses, this gap becomes significantly more critical due to common problems with distraction and disengagement (Ashtari & Taylor, 2021). Research indicates that the impact of gamification on user motivation varies depending on learning preferences and contextual factors (Papadakis et al., 2020; Gulinna & Lee, 2020). Hence, it is clear that additional empirical research is needed to examine both the effect of UTAUT constructs on attitude towards gamification and how these attitudes might shape separate dimensions of student engagement and skill.

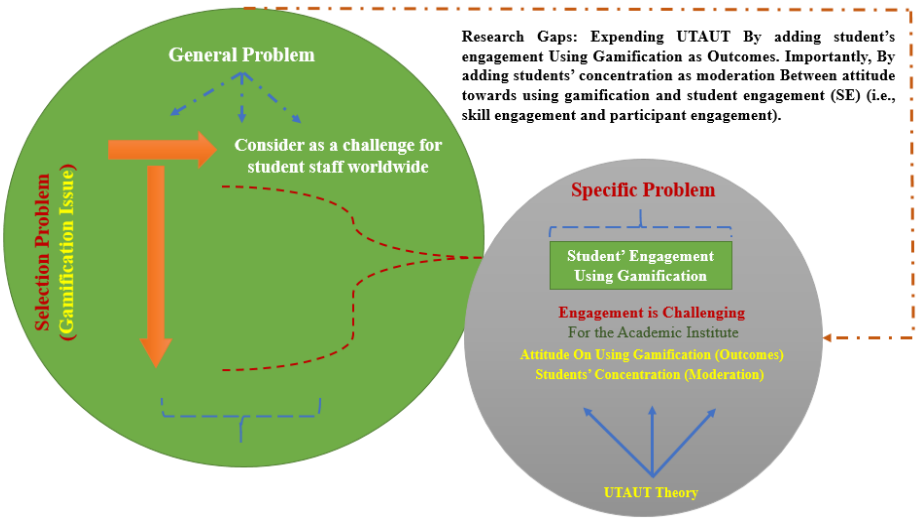


Figure 1.2 Problem Statement Configuration

1.5 Research Questions

This research study aimed to investigate whether gamification can be an effective tool for learning compared to traditional methods. Thus, the primary goal of the current research was to answer the following question: "Does gamification influence the students to enjoy learning through engagement and interaction with the gamification method?"

1.5.1 Specific Research Questions

The specific research questions were established based on the research problems, indicated as follows:

RQ:1 What is the relationship between UTAUT components—performance expectancy, effort expectancy, social influence, and facilitating conditions—and individuals' attitudes toward using gamification?

RQ:2 What is the relationship between attitudes toward using gamification and student engagement, specifically focusing on skill engagement and participant engagement?

RQ:3 To what extent does students' concentration moderate (conditionally) the relationship between attitude toward using gamification and student engagement (i.e., skill engagement)?

RQ:4 Do students' concentration moderate (conditionally) the relationship between attitude toward using gamification and student engagement (i.e., participant engagement/interaction of gamification)?

1.6 Research Objectives

The main objective of this study was to identify the factors that influence undergraduate students' engagement with game elements in Saudi Arabian public universities. The study aimed to expand existing theories by integrating the UTAUT, SDT, and FT into a single theoretical framework. The sub-objectives are clarified further below:

RO:1 To identify the relationship between UTAUT components—performance expectancy, effort expectancy, social influence, and facilitating conditions—and individuals' attitudes toward using gamification.

RO:2 To examine the relationship between attitudes toward using gamification and student skill engagement and participant engagement.

RO:3 To evaluate the extent to which students' concentration moderates (conditionally) the relationship between attitude toward using gamification and student engagement (i.e., skill engagement).

RO:4 To determine whether students' concentration moderates (conditionally) the relationship between attitude toward using gamification and student engagement (i.e., participant engagement/interaction of gamification).

1.7 Significance of the Research

The study has contributed to practical and theoretical aspects. Practically, the study's findings can help policymakers and the government design policies that enhance e-learning across public universities in Saudi Arabia. This is because Saudi universities are still struggling with traditional educational systems. The current study attempted to address this issue through adapting e-learning systems (e.g., gamification). In this regard, the policymakers, the government and the university

would understand the real situation affecting the development of e-learning in public university education. Therefore, the study has important implications for higher education institutes in KSA, as it addresses the critical notion of innovative techniques in delivering e-learning (gamification) by properly guiding students towards engagement within the university educational level.

There are serious flaws in the conventional teaching-learning process, which emphasises teacher-directed instructional techniques. With the help of contemporary classroom technology, teachers can now efficiently utilise a wide range of materials and tools to deliver lessons. A helpful tool that can assist teachers in engaging students with diverse learning styles is game-based learning (GBL) (Huang et al., 2019). It can improve a wide range of associated abilities, including engagement, accomplishment orientation, problem-solving, creativity, and teamwork. Like many other nations, the Kingdom of Saudi Arabia faces challenges with student involvement and participation in higher education. With its superior skills for using technology in education, KSA have the necessary experience to implement gamification in learning (Sulphey, 2017). A carefully implemented gamification learning program will support the required efforts to ensure the engagement and participation of indigenous students.

Therefore, the present study analysed the possible factors that can assist institutions and students in adapting and utilising gamification in the context of the higher education sector in KSA. The results of this study, therefore, guide for improving the quality of using the innovation process to enhance higher education and achieve better performance. Particularly, it offers clear guidance for relevant practitioners on the most fundamental components that encourage innovation by focusing on engagement and interaction that can be implemented in Saudi universities

(El Tantawi et al., 2018). The current study also focused on students' engagement and interaction in adapting gamification, which may better inform policymakers in their decisions.

The integration of gamification into educational settings represents a contemporary approach aimed at addressing challenges in student engagement and learning outcomes. In traditional educational contexts, maintaining high levels of student motivation and active participation can be a persistent challenge. Gamification seeks to remedy this by incorporating game-like elements, such as rewards, competition, and progress tracking, into non-game environments like classrooms. This approach is designed to tap into intrinsic motivations, enhance learning experiences, and encourage students to take a more proactive role in their education. However, while gamification holds promise for transforming educational practices, its practical implementation and impact on student engagement require deeper exploration. Therefore, this research examined the intricate dynamics of gamification in educational settings, specifically investigating how various factors influence students' attitudes toward gamification. These factors are crucial as they shape students' perceptions of the utility, ease of use, social norms, and resources available for engaging with gamified educational activities. Understanding these influences is crucial for designing compelling gamified learning experiences that resonate with students and improve their educational outcomes.

Furthermore, this study aimed to explore the direct effects of students' attitudes toward using gamification on their levels of engagement in educational activities. Engagement encompasses both skill engagement, involving cognitive and behavioural aspects of active learning, and participant engagement, which involves emotional and motivational aspects of involvement in educational tasks. By investigating these

relationships, the research aimed to understand how gamification can effectively promote deeper engagement among undergraduate students in Saudi public universities.

Moreover, the study intended to introduce students' concentration as a potential moderating factor on the relationship between attitudes toward gamification and student engagement. This moderation analysis aims to shed light on how students' focus and attention during gamified learning experiences may enhance or diminish the effects of their attitudes on their overall engagement levels. Such insights are crucial for refining instructional designs and strategies that leverage gamification to optimise educational outcomes in higher education contexts.

Theoretically, past studies in Saudi Arabia used theories such as TAM, TRA, and STD theory to explain student attitudes and engagement towards using gamification in higher education. In contrast, this current study employed a combination of UTAUT, self-determination theory, and flow theory. These theories were integrated into a single model and have significantly guided research in understanding student attitudes and engagement in the e-learning process within Saudi public university education. However, the assumptions of the theories are incorporated with the study findings; as such, the theory can be used to understand and explain student attitudes and engagement in gamification. Therefore, the study has contributed to and enhanced the theories that emphasise participation, attitude, and engagement in the e-learning process, especially from the higher education perspective, as an essential institution in developing students.

Furthermore, the study enhanced the body of knowledge. The essence of this current study was to enhance the existing literature by identifying areas that had not

been previously explored, thereby providing additional information about issues not addressed in the existing literature. Although several studies have been conducted in Saudi Arabia to explain gamification, other important aspects have not been adequately captured by the existing literature, particularly in the areas of student engagement, the use of UTAUT, self-determination, and flow theories. This further underscores the need for additional studies to provide comprehensive information about the challenges associated with using traditional methods in the teaching and learning process in higher education. In this regard, this current study primarily focused on addressing issues by adopting an e-learning system, specifically examining student attitudes and engagement in gamification within public universities. Therefore, all these identified issues were fulfilled in this current study.

In sum, this research addresses a significant gap in the literature by providing a comprehensive examination of the role of gamification in enhancing student engagement in higher education. By elucidating the mechanisms through which gamification influences attitudes and engagement, the study aims to provide practical insights and recommendations for educators, policymakers, and instructional designers seeking to leverage gamification in educational practice effectively.

1.8 Scope of the Study

The study focuses solely on factors influencing undergraduate student of Saudi Arabian public universities to engage in online learning process, particularly gamified. This gamified approach aims to enhance student attitude and engagement in online learning systems. However, the study employed a quantitative method based on a correlational study, which aimed to assess whether a relationship existed between variables (Creswell, 2005). The independent variables of this study were the UTAUT

components (i.e., performance expectancy, effort expectancy, social influence, and facilitating conditions). In contrast, the dependent variables were the attitude toward using gamification and student engagement (i.e., participant engagement and interaction with gamification). Moreover, the moderating role of students' concentration was also included in the framework.

The result (data) was generated from the sample of the study (undergraduate students), who were identified through non-probability sampling using convenience sample techniques from the five Saudi public universities: Hail University, Qassim University, University of Tabuk, Taif University and Taibah University. The data is restricted to the participants and universities involved in the study. The study spanned a four-year period (2020-2024). The study aimed to understand the factors that influence students' attitudes toward engaging in online learning.

The overall assessment of the constructs followed the following procedures. At the beginning of the semester, the researcher set an agreement with lecturers to provide a short introduction regarding the use of gamification in the classroom (e.g., Kahoot! and Quizizz). Students had the option to use their own devices, such as smartphones or tablets, in addition to the laboratory computers. Core lessons followed the established lesson plan, with a Kahoot pop quiz given after each subtopic to assess understanding before progressing further. Periodically, Quizizz was used for additional assessments, with the points contributing 5% to the students' overall grades. At the end of the semester, a survey was conducted to gauge student engagement and interaction with gamified lessons. The quantitative data gathered were analysed using the most advanced technique of structural equation modelling (SEM) via the Smart-PLS software. The discussion was centred around undergraduate students and the proposed

model. The survey results provided valuable insights, supporting the recommendation to incorporate gamification in information technology courses at Saudi universities. The scope of the study is shown in Figure 1.3.

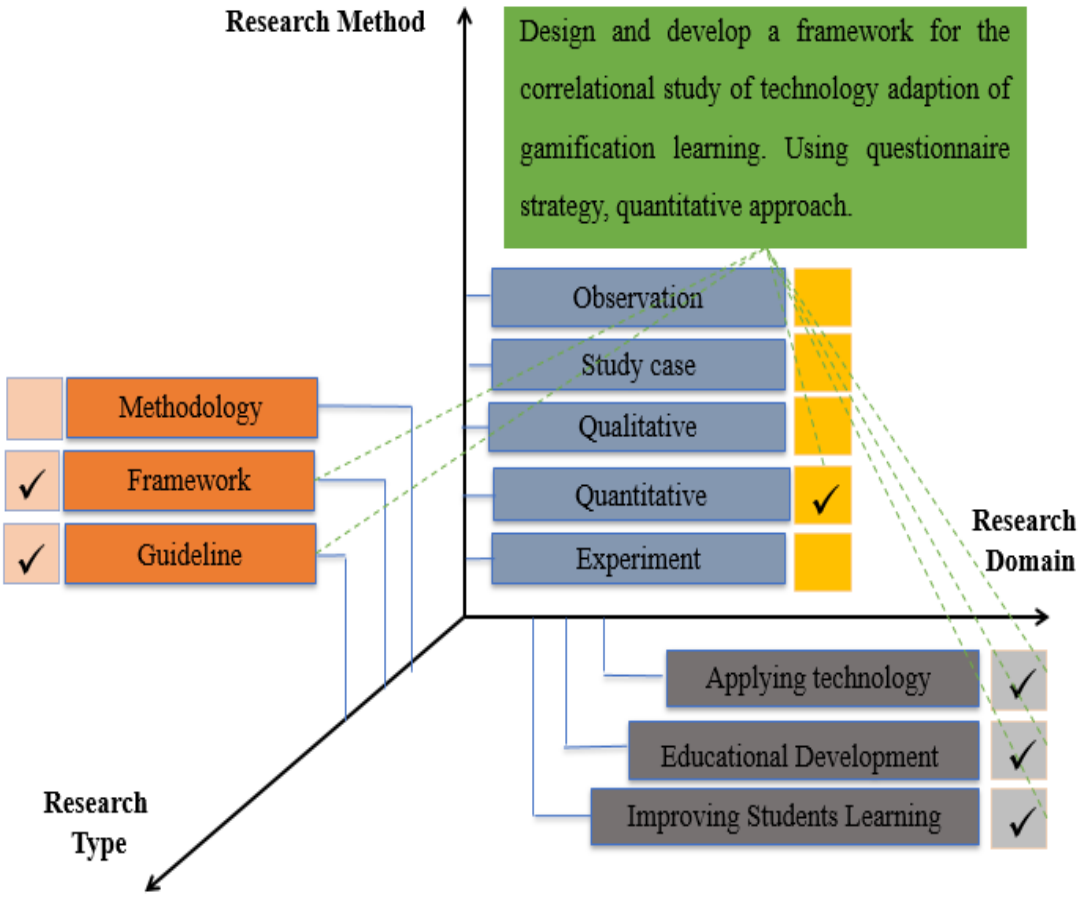


Figure 1.3 Scope of Study

1.9 Definition of Terms

To ensure consistency throughout the thesis, a standardised guide for defining key terms is required. The definitions utilised in this thesis are outlined below.

1.9.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT is a model developed by Venkatesh et al. (2003) that integrates eight user acceptance theories to study factors influencing technology acceptance.

However, this study focused on the core variables of this model, which involved performance expectancy, effort expectancy, social influence, and facilitating conditions. Each element is detailed as follows:

i) **Performance Expectancy (PE)** is described as "the degree to which the user expects that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, p. 447). In this study, performance expectancy was used to assess students' perceptions of the use of gamification in higher education. High-performance expectancy indicates that students believe gamification will enhance their learning outcomes, improve their academic performance, and make their educational experience more engaging and effective. It reflects the perceived value and benefits of integrating game elements into educational activities, including increased motivation, improved information retention, and enhanced problem-solving skills.

ii) **Effort Expectancy (EE)** refers to "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). In the present study, effort expectancy was utilised to evaluate students' perceptions regarding the complexity of the gamified learning system. Specifically, it assessed how difficult or easy students found the system to use. High effort expectancy indicates that students perceive the system as user-friendly, intuitive, and requiring minimal effort to learn and operate. This perception is crucial for technology adoption, as students are more likely to engage with and consistently use a system that they find easy to navigate. By understanding effort expectancy, educators and developers can design gamified educational tools that reduce

complexity, streamline the user experience, and ensure that students can focus on their learning objectives rather than being hindered by technical difficulties.

iii) **Social Influence (SI)** is defined as "the degree to which an individual perceives that important others believe he or she should use the new system", according to Venkatesh et al. (2003, p. 451). In the present study, social influence was examined as a direct determinant of behavioural attitude, representing the subjective norm. This means that students may alter their behaviour and attitudes toward using a gamified learning system based on the perceptions and expectations of significant others, such as peers, instructors, or family members. When influential figures within their social circle endorse and encourage the use of the system, students are more likely to adopt and engage with it. Social influence highlights the role of social pressure and peer support in shaping technology adoption, suggesting that creating a positive and supportive social environment around the use of gamification in education can significantly enhance its acceptance and usage among students.

iv) **Facilitating Conditions (FC)** are "the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system", as defined by Venkatesh et al. (2003, p. 453). In this study, facilitating conditions were employed to assess the overall support provided by the organisation to the users, including technical support. This encompasses the availability of necessary resources, including reliable internet access, suitable devices, and

comprehensive technical support. High-facilitating conditions indicate that students feel confident in the availability of support and resources needed to utilise the gamified learning system effectively. This factor is crucial for technology adoption, as adequate facilitating conditions ensure that students can overcome potential technical barriers and focus on their learning activities. By understanding and improving facilitating conditions, educational institutions can create an environment that supports seamless integration and sustained use of gamification in education.

v) **Attitude Toward Using Technology (ATUT)** is defined "as an individual's overall affective reaction to using a system" (Venkatesh et al., 2003, p. 455). In this study, attitude toward using a system was adapted to evaluate students' encouragement and enthusiasm in using gamification techniques in the classroom. A positive attitude toward technology reflects a favourable emotional response, indicating that students find gamified learning enjoyable, engaging, and beneficial. This factor is critical as it directly influences students' willingness to adopt and continue using gamification methods. By assessing ATUT, educators can gain insights into how students perceive the integration of game elements into their learning process and identify strategies to enhance their positive experiences and overall satisfaction with the technology.