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The Role of Perceived Usefulness and Ease of Use in Online Gamification: A Conceptual Study Using Gamification Acceptance Model (GAM) in Higher Education

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Abstract: To examine the effectiveness of gamification techniques in improving student engagement using the Gamification Acceptance Model (GAM) and to address the lack of awareness and uncertainty among educators regarding students' acceptance of online gamification. A probability sampling method with proportionate stratified sampling is used to select participants. A quantitative approach is adopted, using a survey to collect data, which will be analyzed using Structural Equation Modelling (Partial Least Squares). The study is expected to provide insights into students' attitudes toward online gamification and demonstrate that gamification can be an effective tool for enhancing learning through play. Specifically, Gamification Perceived Usefulness (GPU), influenced by Gamification Ease of Use (GEOU), is anticipated to be significant in shaping students' acceptance of gamified learning. The findings could serve as a metric for evaluating students' acceptance of gamification and guide educators in creating effective game-based learning strategies. However, the study is limited to students from a single course and campus, which may limit the generalizability of the results. This study contributes to the growing body of research on gamification in higher education by applying the Gamification Acceptance Model (GAM) as a robust framework. It highlights the potential of online gamification to enhance student engagement and provides practical insights for educators to design more engaging and personalized learning environments.

Keywords: O*nline gamification, Students' engagement, Gamification perceived usefulness, Gamification ease of use, Attitude towards using gamification*

1. Introduction

Traditional teaching and learning have a long history dating back to ancient civilizations, where knowledge was primarily transmitted through oral traditions and apprenticeships (Onofrei & Ferry, 2020). Over time, the development of education led to the establishment of formalized schools, universities, and other educational institutions, which relied heavily on traditional teaching methods as the dominant mode of instruction (Platz, 2022). Traditional methods, such as lecturing and rote memorization, have been the primary means of delivering information to students in many educational settings. However, these methods have faced significant criticism for their limitations in fostering effective learning outcomes. Research indicates that traditional methods can lead to decreased student engagement, resulting in limited learning gains and poor academic performance (Byusa et al., 2022).

A key issue with traditional teaching methods is their inability to cater to the diverse learning needs and styles of students. While some students may excel in a lecture-based environment, others struggle to engage with the material without interactive and personalized instruction. The one-size-fits-all approach inherent in traditional teaching can result in inadequate learning outcomes and reduced student satisfaction. Consequently, there has been increasing interest in innovative teaching approaches that address the needs of modern students. These approaches incorporate interactive learning activities and personalized instruction, which have been shown to enhance engagement, motivation, and effective learning outcomes. Innovative teaching methods hold the potential to revolutionize education and empower students to reach their full potential (Fjællingsdal & Klöckner, 2020; Onofrei & Ferry, 2020).

Innovative teaching and learning represent a paradigm shift from traditional methods that have been prevalent in educational institutions for decades. These approaches, which have gained significant attention in recent years, address the limitations of traditional methods by leveraging new technologies, interactive activities, and personalized instruction (Platz, 2022). Among these, educational online gamification has emerged as a promising strategy for promoting engagement, motivation, and effective learning outcomes. These gamified

tools integrate educational content and objectives while delivering a fun and engaging experience for learners (Byusa et al., 2022).

One of the primary advantages of online gamification is the increased engagement and interaction it offers students (Byusa et al., 2022). While traditional methods often fail to address diverse learning needs, gamified tools create immersive and interactive experiences that foster motivation and interest in the subject matter. By tailoring content and design to individual students' needs, educators can ensure effective engagement, improved learning outcomes, and greater satisfaction with the educational experience.

However, while gamification shows promise, there is limited research on how students accept and adopt gamified learning environments (Fjællingsdal & Klöckner, 2020). Specifically, few studies have examined factors influencing students' acceptance of gamification based on the Gamification Acceptance Model (Dicheva et al., 2015). Understanding these factors is crucial for developing effective and widely accepted gamified educational strategies (Byusa et al., 2022). Together, these experiences strengthen learning retention, active participation, and social collaboration, positioning online gamification as a powerful tool for sustained student engagement in educational activities.

2. Literature Review

Student Engagement in Online Gamification

Student engagement in online gamification for learning activities is defined as the level of active participation, interest, and motivation that students exhibit while playing online board games (Luo, 2024). Engaged students demonstrate a willingness to learn, display positive emotions, and actively participate in the game (Feng et al., 2024). They exhibit a sense of excitement, interest, and enthusiasm towards the game and the overall learning experience.

Engaged students also tend to be more persistent in their efforts, more willing to seek out new information, and more likely to take ownership of their learning (Rahman et al., 2018). They are inclined to ask questions, collaborate with others, and experiment with new strategies. In contrast, disengaged students may exhibit a lack of interest or motivation in the game, display negative emotions, and demonstrate minimal participation (Platz, 2022). They may become easily distracted or lack confidence in their ability to succeed, which can result in reduced effort and persistence.

Research has shown that students who are engaged in learning activities, including online gamification, are more likely to achieve better learning outcomes (Nugroho, 2024). These outcomes highlight that engaged students are more likely to retain information and apply it in diverse contexts, showcasing the effectiveness of gamified tools in achieving educational goals. Engaged students are also more likely to develop essential skills such as critical thinking, problem-solving, and communication skills (Feng et al., 2024). These benefits reinforce how students perceive gamified tools as valuable for holistic skill development, thereby emphasizing the utility of gamification in education.

Perceived usefulness, as defined by Davis et al. (1989), reflects individuals' beliefs regarding the enhancement of their performance through a specific system or application. Applied to gaming apps, users are more likely to intend to use an app if they perceive it as purposeful and contributing positively to their gaming experience. This perception of usefulness shapes users' views on the app's value and utility in achieving gaming goals or providing an enjoyable experience. A strong positive correlation between perceived usefulness and behavioral intention suggests that users are inclined to engage with and continue using a gaming app when they perceive it as beneficial and advantageous (Lopes et al., 2024). When students perceive gamification as useful, they are more likely to adopt it with a positive attitude, resulting in higher engagement, satisfaction, and learning success.

Perceived ease of use refers to the extent to which individuals believe that a technology or system can be used with minimal effort (Davis et al., 1989). In the context of online gamification, ii signifies that students find the learning platform straightforward, easy to navigate, and free from unnecessary complexity. When an online gamified system is perceived as easy to use, it fosters positive attitudes, enhances student engagement, and

increases the likelihood of adoption for educational purposes (Viet Tam et al., 2024). The success of online gamified learning systems lies in achieving a balance between simplicity and the inclusion of engaging, valuable features, allowing students to focus on their learning objectives without being hindered by technical challenges. Attitudes towards online gamification reflect how individuals, particularly students, perceive and respond to the incorporation of gamified features in online platforms (Rapp et al., 2019). These attitudes can range from highly favorable to neutral or negative, depending on factors such as user experience, perceived advantages, and personal preferences. Students' perspectives are shaped by how effectively the system addresses their needs for engagement, functionality, and ease of use. Favorable attitudes can lead to increased adoption and improved learning outcomes, whereas unfavorable attitudes highlight the importance of thoughtful design and implementation (Nugroho, 2024). Recognizing these factors is critical for fully leveraging the potential of gamification in educational settings.

Online gamifications have the potential to enhance student engagement in learning activities because they are often designed to be interactive, challenging, and enjoyable (Feng et al., 2024). Students are more likely to perceive gamified tools as easy to use due to their interactive and intuitive interfaces. The competitive and cooperative elements of many online gamification tools, such as Kahoot and Quizzes, can also foster collaboration, social interaction, and communication skills among students (Rapp et al., 2019). Consequently, these tools promote ease of use by creating an environment in which students can naturally engage and interact without feeling overwhelmed by the system's complexity.

Thus, the benefits of online gamification foster favorable student attitudes by emphasizing its usefulness, ease of use, and capacity to enhance engagement, particularly through Skill Engagement (SKE) and Interaction Engagement (IE) (Rahman et al., 2018). These enriching experiences increase students' willingness to adopt gamified tools, improve learning retention, and encourage openness to gamification in education. SKE, which involves cognitive focus and skill building, and IE, which emphasizes collaboration and social interaction, are key dimensions of engagement that gamification effectively supports (Feng et al., 2024).

Gamification Acceptance Model (GAM)

The Gamification Acceptance Model (GAM) underpins this study to explore students' acceptance of gamification and its effects on engagement during lessons. Inspired by the Technology Acceptance Model (TAM) and student engagement theories, GAM posits a direct relationship between students' perceptions of gamification's utility and their engagement. The model emphasizes three core constructs: Gamification Perceived Usefulness (GPU), Gamification Perceived Ease of Use (GEOU), and Attitude Towards Using Gamification (A). These constructs influence student engagement dimensions, including Skill Engagement (SKE) and Interaction Engagement (IE). GPU reflects the belief that gamification improves learning performance, while GEOU represents the perceived simplicity and ease of using gamified systems. Both factors significantly shape students' attitudes towards gamification, which in turn drives engagement. By fostering cognitive focus, collaboration, and interaction, GAM highlights the transformative potential of gamification in enhancing educational outcomes and fostering sustained student engagement.

Hypotheses Development

Viet Tam et al. (2024) highlighted a relationship between perceived ease of use and perceived usefulness in shaping attitudes towards online gamification. Luo (2024) further demonstrated a positive correlation between ease of use and perceived usefulness in the context of online gamification. This relationship is grounded in the premise that if a gamified system is effortless to operate, students are more likely to recognize its benefits and integrate it effectively into their activities. Based on these findings, the hypothesis is:

H1: Gamification perceived ease of use has a significant impact on students' perceived usefulness of gamification in learning.

The findings of Lopes et al. (2024) revealed that perceived usefulness significantly and positively impacts attitudes towards gamification. This relationship stems from the belief that when students or users perceive gamification as beneficial for achieving their objectives (such as learning or engagement), their attitudes towards its usage are enhanced. Based on these results, the following hypothesis is proposed:

H2a: Gamification perceived usefulness has a significant impact on students' attitudes towards using gamification technology in learning.

Gamification's perceived ease of use plays a crucial role in shaping students' attitudes towards adopting and using gamification technology in educational settings. Nugroho (2024) highlighted that ease of use, alongside usefulness and social influence, positively correlates with attitude and continued use of technology. Specifically, ease of use has a direct positive impact on attitude, making it one of the key determinants of technology acceptance. Based on this, the following hypothesis is proposed:
H2b: Gamification perceived ease of use has a significant impact on students' attitudes towards using gamification technology in learning

Research has consistently demonstrated a strong correlation between the perceived usefulness of gamified tools and their impact on student engagement. For instance, Rapp et al. (2019) found that the perceived usefulness of Kahoot! Positively influenced engagement levels, highlighting the role of gamification in fostering behavioral, emotional, and cognitive engagement. This study also utilizes Kahoot! as an online gamification tool, emphasizing how students who perceive these tools as beneficial are more likely to engage actively in learning activities. These findings highlight the importance of aligning gamification design with educational objectives to maximize both perceived usefulness and its positive impact on student engagement. Thus, it can be hypothesized that:
H3a: Gamification perceived usefulness has a significant impact on students' engagement.

The study conducted by Luo (2024) reveals that perceived ease of use directly correlates with engagement and generally has a positive impact on students' engagement. It also highlighted that the connection between this variable and actual engagement in gamified contexts can vary, influenced by contextual and individual factors. Based on this, the following hypothesis is proposed:
H3b: Gamification perceived ease of use has a significant impact on students' engagement.

Students' attitudes towards using gamification technology play a pivotal role in determining their engagement in learning activities. As a mediating variable, attitude connects perceived usefulness and ease of use to behavioral outcomes, including engagement dimensions such as Skill Engagement (SKE) and Interaction Engagement (IE). Positive attitudes, shaped by favorable perceptions of gamified tools, enhance students' motivation to actively participate in learning activities. Research supports this relationship; for example, Rahman, Ahmad, and Hashim (2018) found a significant positive correlation between attitudes towards gamification and student engagement, particularly when students demonstrate high levels of concentration. Feng et al. (2024) further argued that gamification positively influences college students' engagement, reinforcing the idea that a favorable attitude towards gamification drives deeper cognitive, emotional, and social involvement in educational contexts. This evidence highlights the importance of fostering positive attitudes to maximize the benefits of gamification in enhancing student engagement. Thus, the following hypothesis is developed:
H3c: Students' attitude towards using gamification technology has a significant impact on students' engagement.

Empirical validation of these hypotheses would involve examining the interplay between ·these constructs in gamified learning contexts, using survey instruments and statistical techniques like Structural Equation Modelling (SEM).

Proposed Research Framework

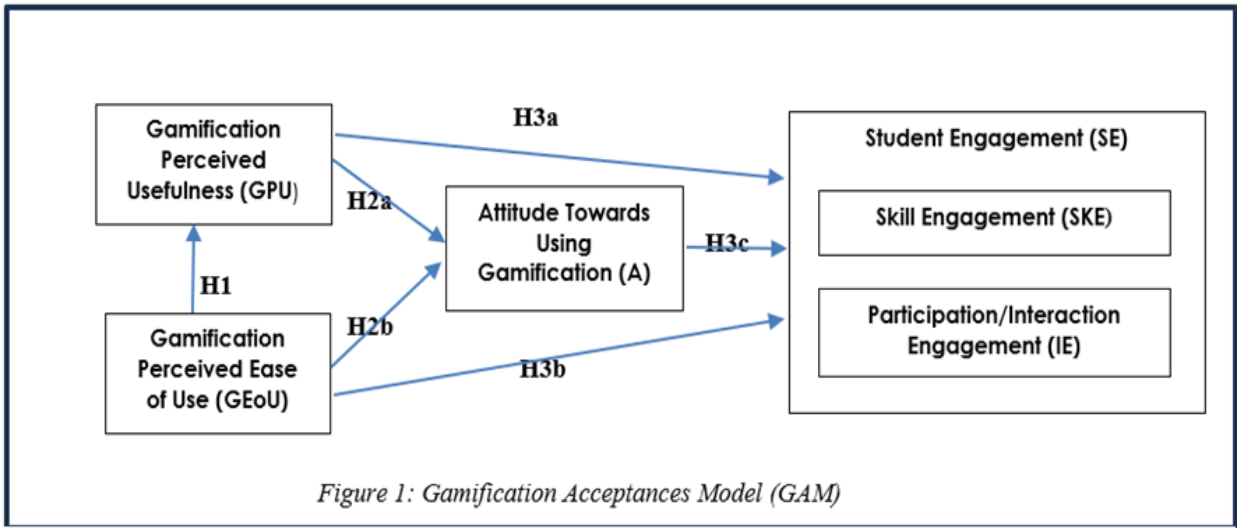


Figure 1: Gamification Acceptances Model (GAM)

Adopted from Rahman et al. (2018)

3. Methodology

This study adopts a quantitative approach to collect data through standardized measures such as surveys, experiments, or observational studies. This approach requires precise objectives and numerical data to test hypotheses and make predictions about a population, making it particularly useful for establishing cause-and-effect relationships or making predictions. The research methodology will involve multiple-item questionnaires based on a five-point Likert scale ranging from one (strongly disagree) to five (strongly agree). The use of this scale is considered efficient in minimizing response bias, increasing statistical power, and reducing errors. However, some studies suggest that expanding beyond a five-point scale may improve the sensitivity of variables impacting reliability. The questionnaires will be distributed via online platforms.

This study follows Neuman's (2014) seven-step research methodology, commonly used in quantitative investigations. The process begins with selecting a research topic, which in this case focuses on online gamification, students' engagement, and the components of the Student Course Engagement Questionnaire (SCEQ). Next, the study develops research questions based on theoretical approaches and previous studies, with an emphasis on defining students' engagement and acceptance of gamification. The SCEQ is adapted to address the issues of students' engagement and their acceptance of gamification, with research questions designed to address gaps in the literature. The study's design involves choosing the type of studies and samples, determining the population and sample size, sampling procedures, and the unit of analysis. Data collection includes engaging with experts, such as academicians and industrial practitioners, to validate the survey instruments. Finally, the research cycle concludes with data reporting.

4. Expected Findings

The data analysis in this study involves using the Statistical Package for the Social Sciences (SPSS) and Structural Equation Modelling (SEM). These tools will be utilized for conducting descriptive statistics and analyzing the overall study data. The initial data analysis stage involves checking for missing values, outliers, and data normality. The quantitative data collected from the survey questionnaire will be analyzed using SPSS software. To address missing values resulting from respondents failing to answer questions, the data will be filtered using mean value replacement. Any items with missing values exceeding 5 per cent will be removed. Outliers will be identified using a standard deviation analysis method, specifically the standardized z-score. Extreme responses to individual or multiple questions will be examined to detect any outliers.

5. Conclusion and Recommendations

Studying students' engagement with online gamification techniques for learning activities can help educators create more engaging and effective learning experiences that promote positive outcomes and skill development for students. This research contributes to the growing body of literature on gamification in education, particularly in higher education. Employing the GAM framework provides an empirical basis for understanding how gamification elements influence student motivation, engagement, and learning outcomes. For students, this study offers a novel and engaging way to learn that diverges from traditional classroom settings. By emphasizing user engagement, this research supports the creation of learning experiences tailored to meet diverse student preferences, ultimately improving satisfaction and academic performance in online education. For educators and faculty, this study presents an innovative teaching approach to engage students who may struggle with traditional methods. Insights from this study can guide educators and instructional designers in effectively integrating gamification techniques into online learning environments. It highlights the gamification elements most impactful in promoting active participation and sustained interest among students. For universities, this study provides evidence to adopt innovative teaching strategies, enhance the quality of online learning programs, and address challenges in student retention and engagement.

This study also paves the way for further exploration of gamification in different educational contexts, fostering a deeper understanding of its effectiveness across various disciplines and cultural settings. By utilizing the Gamification Acceptance Model (GAM) to assess the effectiveness of online gamification techniques, educators and game designers can develop tools tailored to specific learning objectives and student needs, thereby contributing to the overall improvement of learning experiences in higher education.

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