

THE INFLUENCE OF GAMIFICATION INTEGRATION IN TEACHING AND LEARNING ON STUDENT MOTIVATION AMONG UNDERGRADUATE STUDENTS AT UNIVERSITI PENDIDIKAN SULTAN IDRIS, MALAYSIA

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Abstract. This study was undertaken to address the issue of declining student motivation in teaching and learning (T&L), which is often associated with conventional and less interactive instructional approaches. The study aimed to examine the influence of gamification integration in T&L on student motivation at Universiti Pendidikan Sultan Idris (UPSI), Malaysia. A quantitative research approach employing a deductive design was adopted. Data were collected through an online questionnaire administered to 377 diploma and undergraduate students selected using simple random sampling. The research instrument was adapted from established measures used in previous studies. Descriptive and inferential statistical analyses were conducted to determine the level of gamification integration and its influence on student motivation. The findings revealed a high level of gamification integration, with students responding particularly positively to reward systems, leader boards and immediate feedback mechanisms. Furthermore, the regression analysis demonstrated that gamification integration has a significant positive influence on student motivation. The study highlights the potential of gamified learning environments to enhance student engagement and motivation in higher education. It is recommended that lecturers systematically incorporate gamification elements into teaching activities and align them with clearly defined learning objectives to maximise their effectiveness.

Keywords: gamification; student motivation; teaching and learning; undergraduate students; higher education

1. Introduction

The higher education landscape is undergoing rapid transformation driven by technological advancement, digitalisation, and the increasing integration of artificial intelligence (AI) into teaching and learning (Hidayah Tokiman & Nor Maizatul Akmal Mohd Zubir, 2024). These developments have significantly reshaped the ways in which knowledge is created, delivered, and accessed within universities. As a result, traditional lecture-based approaches are increasingly being supplemented by more interactive, student-centred pedagogies that better align with the expectations and learning preferences of contemporary students. Often characterised as digital natives (Prensky, 2001), today's learners are accustomed to technology-rich environments that emphasise interactivity, immediacy, and

engagement. Consequently, they tend to favour experiential and technology-enhanced learning experiences over passive forms of instruction (Zaidi, 2025).

In response to these changes, higher education institutions are increasingly adopting innovative teaching approaches designed to enhance student engagement, motivation, and learning outcomes. Digital pedagogies such as blended learning, flipped classrooms, adaptive learning systems, and gamification have gained considerable attention as effective strategies for creating more meaningful learning experiences (Triantafyllou et al., 2025). Among these approaches, gamification has emerged as a particularly promising pedagogical innovation due to its ability to stimulate participation and motivation within educational settings.

Gamification refers to the application of game design elements, including points, badges, leaderboards, challenges, levels, and feedback mechanisms, in non-game contexts such as education (Deterding et al., 2011; Kapp, 2012). Rather than transforming learning into a game, gamification seeks to harness the motivational features of games to create more engaging and rewarding learning experiences. Recent studies have reported that well-designed gamified learning environments can increase student participation, sustain attention, and encourage active learning behaviours (Zainuddin et al., 2024; Lim et al., 2024). In addition, students frequently report higher levels of satisfaction and perceived learning effectiveness when learning activities incorporate clear goals, immediate feedback, and appropriately challenging tasks.

The effectiveness of gamification can be explained through Self-Determination Theory (SDT), which posits that individuals are more intrinsically motivated when their needs for autonomy, competence, and relatedness are fulfilled (Deci & Ryan, 2000; Ryan & Deci, 2017). Gamification supports these psychological needs by providing learners with opportunities for choice, continuous feedback, progress tracking, collaboration, and healthy competition. When these needs are satisfied, students are more likely to develop intrinsic motivation, resulting in greater engagement and deeper learning.

Despite its potential benefits, the effectiveness of gamification in higher education remains inconclusive. While many studies have reported positive effects on motivation and engagement, recent evidence suggests that outcomes vary depending on how gamification is designed and implemented. Li et al. (2024), for example, found that gamification significantly enhances students' sense of autonomy and relatedness, but its impact on competence and long-term learning outcomes is less consistent. Similarly, Lim et al. (2024) argued that some gamification initiatives may generate only short-term engagement driven by external rewards rather than sustained intrinsic motivation.

Recent scholarship therefore emphasises the importance of gamification design quality. Researchers distinguish between shallow gamification, which relies primarily on reward mechanisms such as points and badges, and deep gamification, which incorporates meaningful learning activities aligned with pedagogical objectives and psychological principles (Marquardt et al., 2025). While shallow gamification may increase participation temporarily, deep gamification is more likely to foster sustained motivation and meaningful

learning outcomes through authentic challenges, learner autonomy, and constructive feedback (Martdana & Atno, 2025).

In Malaysia, gamification has gained increasing attention as part of broader efforts to support digital transformation in higher education (Mohamad & Hassan, 2026). Universities are exploring innovative instructional strategies to improve student engagement and learning outcomes while responding to national educational priorities and global developments (Masnih Mustapa & Nurilma Ambo, 2025). At Universiti Pendidikan Sultan Idris (UPSI), gamification has been introduced in selected courses to enhance classroom interaction and student participation. However, its implementation varies across faculties and disciplines, and empirical evidence regarding its effectiveness remains limited.

More importantly, there is a lack of context-specific research examining how UPSI students perceive gamified learning environments and whether such approaches effectively enhance their motivation. This issue is particularly significant because UPSI is a teacher education institution, where students' experiences with innovative pedagogies may influence their future classroom practices. Furthermore, individual factors such as digital literacy, academic background, and learning preferences may affect students' responses to gamification, yet these factors remain underexplored within the Malaysian higher education context (Nazihah Shaari, 2022). Given these gaps in the literature, further empirical investigation is needed to understand the influence of gamification integration on student motivation in teaching and learning at UPSI. Specifically, this study seeks to examine the extent to which gamification contributes to students' motivation and to provide evidence that may guide the effective implementation of gamified learning strategies in higher education.

2. Problem Statement

Student motivation remains one of the most important determinants of effective learning in higher education. Motivated students are more likely to participate actively in learning activities, demonstrate persistence in completing academic tasks, and achieve better educational outcomes. However, many higher education institutions continue to face challenges in maintaining students' motivation, particularly in learning environments that rely heavily on conventional lecture-based approaches. As contemporary students increasingly engage with digital technologies in their daily lives, traditional teaching methods may no longer be sufficient to sustain their interest and active involvement in the learning process.

To address this challenge, higher education institutions have increasingly explored innovative pedagogical approaches that can enhance student motivation and engagement. Among these approaches, gamification has gained considerable attention due to its potential to create more interactive and rewarding learning experiences. By incorporating game design elements such as points, badges, leaderboards, challenges, and feedback mechanisms into educational activities, gamification is expected to increase students' motivation and encourage active participation in learning.

Despite its growing popularity, the effectiveness of gamification remains inconclusive. While numerous studies have reported positive effects on student motivation and engagement, others have found limited or inconsistent outcomes. Recent research suggests that the effectiveness of gamification depends largely on how it is designed and implemented within specific learning contexts. In many cases, educators adopt surface-level gamification elements without integrating them meaningfully into pedagogical objectives, resulting in temporary engagement rather than sustained motivation (Ramirez et al., 2024). Consequently, there remains uncertainty regarding the extent to which gamification can effectively enhance student motivation in higher education settings.

Within the Malaysian higher education context, empirical evidence on the effectiveness of gamification remains relatively limited. Although universities have increasingly incorporated digital learning strategies, the adoption of gamification is still uneven across institutions and academic disciplines. At Universiti Pendidikan Sultan Idris (UPSI), gamification has been implemented in selected courses, often based on individual lecturers' initiatives rather than a systematic institutional approach. As a result, there is limited evidence regarding students' perceptions of gamified learning environments and the extent to which gamification influences their motivation to learn.

This gap is particularly important because UPSI is a teacher education institution that prepares future educators who may later adopt innovative pedagogical practices in their own classrooms. Understanding how students respond to gamified learning environments can therefore provide valuable insights into the effectiveness of this approach and its potential contribution to teaching and learning in higher education. Given the inconsistent findings in the existing literature and the limited context-specific evidence available at UPSI, there is a need for a systematic investigation of the influence of gamification integration on student motivation in teaching and learning. This study seeks to address this gap by examining the relationship between gamification integration and student motivation among students at UPSI, thereby contributing empirical evidence to support the effective implementation of gamification in higher education.

3. Literature Review

3.1 Gamification in Higher Education

Gamification has become an increasingly prominent pedagogical strategy in higher education as institutions seek innovative approaches to enhance student learning and engagement. It refers to the application of game design elements, such as points, badges, leader boards, challenges, levels, and feedback mechanisms, within non-game contexts to encourage desired behaviours and improve user experiences (Deterding et al., 2011; Kapp, 2012). In educational settings, gamification is designed not to transform learning into a game but to utilise the motivational features of game-based systems to support learning processes.

The growing adoption of gamification in higher education is closely linked to the broader digital transformation of teaching and learning. Recent studies indicate that gamification can create more interactive, engaging, and learner-centred educational

environments, particularly when integrated with clear instructional objectives and appropriate learning activities (Zainuddin et al., 2024). Systematic reviews further suggest that gamification can enhance participation, sustain attention, and encourage active involvement in learning tasks. However, researchers consistently emphasise that its effectiveness depends on the quality of instructional design and the alignment between game elements and educational objectives.

Despite its potential benefits, gamification is not universally effective. Several studies have reported that poorly designed gamification initiatives may generate only temporary engagement driven by external rewards rather than meaningful learning experiences (Lim et al., 2024). Consequently, contemporary scholarship increasingly views gamification not merely as a technological innovation but as a pedagogical strategy that requires careful planning, implementation, and evaluation to achieve desired learning outcomes.

3.2 Self-Determination Theory and Student Motivation

Self-Determination Theory (SDT) provides one of the most widely accepted theoretical explanations for the effectiveness of gamification in educational contexts. According to SDT, individuals are more likely to develop intrinsic motivation when three basic psychological needs are satisfied: autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2017). Autonomy refers to an individual's need to experience choice and control over learning activities. Competence relates to the desire to feel capable and effective in completing tasks, while relatedness concerns the need to feel connected to others within a social environment. When these needs are fulfilled, students are more likely to engage actively in learning and demonstrate sustained motivation.

Gamification supports these psychological needs through various mechanisms. Choice-based learning activities and personalised progression pathways can strengthen autonomy, while feedback systems, progress indicators, and achievement recognition can enhance competence. Collaborative activities and social interaction features may promote relatedness. Recent studies suggest that gamification is particularly effective in supporting autonomy and relatedness, although its influence on competence varies according to the design and implementation of game elements (Li et al., 2024).

3.3 Gamification and Student Motivation

Student motivation is widely recognised as a critical factor influencing learning engagement, persistence, and academic achievement. Motivated students are more likely to participate actively in learning activities, demonstrate commitment to academic tasks, and achieve positive educational outcomes. Consequently, enhancing student motivation has become a major objective of contemporary higher education. A growing body of research suggests that gamification can positively influence student motivation when implemented effectively. Elements such as immediate feedback, progress tracking, rewards, challenges, and achievement systems can increase students' sense of accomplishment and encourage continued participation in learning activities. Recent studies have reported that students in

gamified learning environments often demonstrate higher levels of motivation than those exposed to conventional instructional approaches (Zainuddin et al., 2024).

Nevertheless, evidence regarding the motivational impact of gamification remains mixed. While many studies report positive outcomes, others suggest that motivation gains may be short-lived when gamification relies excessively on extrinsic rewards such as points, badges, and rankings. In such cases, students may become motivated primarily by rewards rather than by genuine interest in learning. Researchers therefore argue that sustainable motivational benefits are more likely when gamification is integrated with meaningful learning activities that support students' autonomy, competence, and relatedness needs.

3.4 Synthesis of Literature and Research Gap

The literature indicates that gamification has considerable potential to enhance student motivation in higher education. Existing studies generally support the view that gamified learning environments can increase participation, engagement, and motivation, particularly when game elements are aligned with pedagogical objectives and psychological principles. Self-Determination Theory provides a strong theoretical basis for understanding how gamification influences motivation through the fulfilment of students' needs for autonomy, competence, and relatedness.

However, the evidence remains inconsistent regarding the extent and sustainability of these effects. Differences in instructional design, implementation strategies, learning contexts, and student characteristics contribute to variations in research findings. Furthermore, empirical studies examining the effectiveness of gamification within Malaysian higher education institutions remain limited, particularly in the context of teacher education institutions such as Universiti Pendidikan Sultan Idris (UPSI).

Given the limited context-specific evidence and the continuing debate regarding the effectiveness of gamification, there is a need for further investigation into the relationship between gamification integration and student motivation. This study seeks to address this gap by examining the influence of gamification integration on student motivation among students at UPSI as depicted in Figure 1.

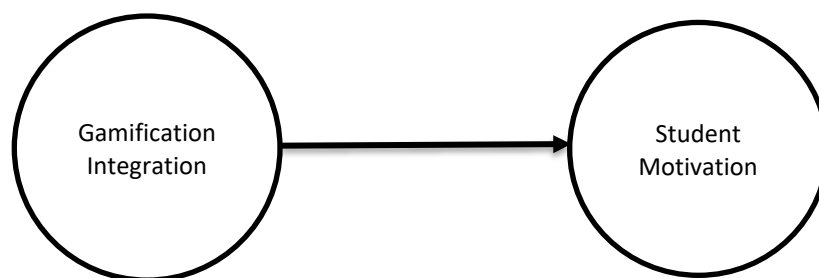


Figure 1. The Relationship Between Gamification Integration and Student Motivation in Teaching and Learning

4. Research Hypothesis

The relationship between gamification and student motivation is supported by both theory and empirical evidence. Self-Determination Theory (SDT) posits that individuals are more likely to develop intrinsic motivation when their psychological needs for autonomy, competence, and relatedness are fulfilled (Deci & Ryan, 2000; Ryan & Deci, 2017). Gamification supports these needs by providing learners with opportunities for achievement, feedback, progression, and social interaction through elements such as points, badges, leaderboards, challenges, and rewards.

Previous studies have consistently reported positive associations between gamification and student motivation in educational settings. Research indicates that well-designed gamified learning environments can enhance students' interest, participation, persistence, and overall motivation to engage in learning activities (Gani et al., 2024). These findings suggest that the integration of gamification into teaching and learning may create a more engaging and motivating educational experience for students. Based on the theoretical foundation of Self-Determination Theory and the empirical evidence reported in previous studies, the following hypothesis is proposed:

H1: Gamification integration significantly influences student motivation in teaching and learning among students at UPSI.

5. Methodology

This study employed a quantitative research approach based on a deductive research paradigm. The quantitative approach was considered appropriate because the study sought to examine the influence of gamification integration on student motivation in teaching and learning and to test a hypothesis derived from Self-Determination Theory (SDT) (Deci & Ryan, 2000). A cross-sectional survey design was adopted, whereby data were collected from respondents at a single point in time. This design is widely used in educational research to investigate relationships among variables and to provide empirical evidence for theory testing. The study examined the influence of gamification integration (independent variable) on student motivation (dependent variable) among undergraduate students at Universiti Pendidikan Sultan Idris (UPSI). The proposed relationship was analysed using statistical techniques, including descriptive and inferential analyses.

5.1 Population and Sampling

The target population comprised 21,582 undergraduate students enrolled at UPSI. Based on Krejcie and Morgan's (1970) sample size determination table, a minimum sample of 377 respondents was considered sufficient to represent the population. A simple random sampling technique was employed to ensure that each undergraduate student had an equal opportunity to participate in the study. Respondents were selected from the university's student population until the required sample size was achieved. The use of probability sampling enhanced the representativeness of the sample and reduced sampling bias, thereby improving the generalisability of the findings.

5.2 Research Instrument

Data were collected using a structured self-administered questionnaire. The instrument was developed based on previously validated scales and adapted to suit the context of the present study.

Table 1: Research Instrument

Variable	Source	Number of Items
Gamification Integration	Hamari et al. (2014); Dichev and Dicheva (2017)	10
Student Motivation	Vallerand et al. (1992)	12

The questionnaire consisted of 22 items. All items were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The items measuring gamification integration assessed students' perceptions of the use of game elements such as points, badges, leaderboards, rewards, challenges, and feedback mechanisms in teaching and learning. Student motivation was measured using items adapted from the Academic Motivation Scale (AMS), which assessed both intrinsic and extrinsic motivational dimensions.

5.3 Validity and Reliability

Content validity was established through expert review involving three academics with expertise in educational technology, teaching and learning, and quantitative research methodology. The experts evaluated the relevance, clarity, and appropriateness of the questionnaire items. Based on their recommendations, several items were revised, redundant items were removed, and minor linguistic adjustments were made to improve clarity and readability.

Face validity was assessed through a pilot study involving 30 undergraduate students who shared characteristics similar to the target population. Participants reported that the questionnaire items were clear, understandable, and relevant to their learning experiences. The reliability of the instrument was assessed using Cronbach's Alpha coefficient. According to Hair et al. (2019), values above 0.70 indicate acceptable reliability. The pilot study results demonstrated satisfactory internal consistency for all constructs.

Table 2: Reliability Analysis

Construct	Cronbach's Alpha
Gamification Integration	0.89
Student Motivation	0.91
Overall Instrument	0.90

These results indicate that the instrument possessed excellent reliability and was suitable for the main study.

5.4 Data Collection Procedure

Following expert validation and pilot testing, the final questionnaire was administered online using Google Forms. Respondents were informed about the purpose of the study and were required to provide informed consent before completing the questionnaire. Participation was voluntary, and respondents were assured that their responses would remain anonymous and confidential. No personally identifiable information was collected. The data collection process continued until the targeted sample size of 377 respondents was achieved.

5.5 Data Analysis

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS) version 29. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to describe respondents' demographic characteristics and the levels of gamification integration and student motivation. Inferential statistical analysis was conducted to test the research hypothesis. Reliability analysis was performed using Cronbach's Alpha to assess internal consistency. Subsequently, simple linear regression analysis was employed to examine the influence of gamification integration on student motivation. Statistical significance was evaluated at the 0.05 level.

6. Research Findings

6.1 Demographic Profile of Respondents

A total of 377 undergraduate students from Universiti Pendidikan Sultan Idris (UPSI) participated in this study. Table 1 presents the demographic characteristics of the respondents. In terms of gender, 245 respondents (65.0%) were female and 132 respondents (35.0%) were male. Regarding age, the majority of respondents were aged between 22 and 23 years (75.1%, $n = 283$), followed by those aged 24–25 years (19.1%, $n = 72$), 26–27 years (5.3%, $n = 20$), and 20–21 years (0.5%, $n = 2$).

With respect to year of study, most respondents were fourth-year students (74.3%, $n = 280$), followed by third-year students (23.9%, $n = 90$) and second-year students (1.9%, $n = 7$). All respondents were enrolled in bachelor's degree programmes. Regarding faculty affiliation, the largest proportion of respondents came from the Faculty of Management and Economics (44.6%, $n = 168$), followed by the Faculty of Science and Humanities (17.0%, $n = 64$), the Faculty of Languages and Communication (12.7%, $n = 48$), and the Faculty of Computing and Meta-Technology (10.6%, $n = 40$). The remaining respondents were distributed across other faculties.

Table 3: Demographic Distribution of Study Respondents

Background of Respondents	Frequency (F)	Percentage (%)
<i>GENDER</i>		
Male	132	35.0
Female	245	65.0
<i>AGE</i>		
20–21 Years	2	0.5
22–23 Years	283	75.1
24–25 Years	72	19.1
26–27 Years	20	5.3
<i>YEAR OF STUDY</i>		
Year 1	0	0.0
Year 2	7	1.9
Year 3	90	23.9
Year 4	280	74.3
<i>LEVEL OF STUDY</i>		
Bachelor's Degree	377	100.0
<i>FACULTY</i>		
Faculty of Management and Economics	168	44.6
Faculty of Science and Humanities	64	17.0
Faculty of Languages and Communication	48	12.7
Faculty of Computing and Meta-Technology	40	10.6
Faculty of Science and Mathematics	23	6.1
Faculty of Human Development	13	3.4
Faculty of Arts, Sustainability and Creative Industry	11	2.9
Faculty of Music and Performing Arts	6	1.6
Faculty of Sports Science and Coaching	4	1.1

6.2 Correlation Analysis

Pearson's Product-Moment Correlation Analysis was conducted to examine the relationship between gamification integration and student motivation. The results revealed a strong positive and statistically significant relationship between the two variables ($r = 0.921$, $p < 0.01$). The positive correlation coefficient indicates that higher levels of gamification integration are associated with higher levels of student motivation. The findings provide preliminary evidence supporting the proposed relationship between the variables.

6.3 Regression Analysis

Simple linear regression analysis was performed to determine whether gamification integration significantly predicts student motivation among undergraduate students at UPSI. The model summary is presented in Table 2. The results show a strong relationship between gamification integration and student motivation ($R = 0.921$). The coefficient of determination ($R^2 = 0.849$) indicates that approximately 84.9% of the variance in student motivation can be explained by gamification integration.

Table 4: Model Summary

Model	R	R-Square	Adjusted R-Square	Standard Error of the Estimate
1	.921a	.849	.848	.40814

a. Predictors: (Constant), Integration

Table 3 presents the regression coefficients. The findings indicate that gamification integration significantly predicts student motivation ($\beta = 0.921$, $t = 45.875$, $p < 0.001$). The positive beta coefficient suggests that higher levels of gamification integration are associated with higher levels of student motivation.

The regression equation can be expressed as follows:

$$\text{Student Motivation} = 0.075 + 0.921(\text{Gamification Integration})$$

The significance value ($p < 0.001$) indicates that the relationship is statistically significant. Therefore, the study hypothesis is supported.

H1: Gamification integration significantly influences student motivation in teaching and learning among students at UPSI.

Table 5: Coefficients of Simple Linear Regression Analysis

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (β)	t	Sig.
(Constant)	0.075	0.072	–	1.040	0.299
Gamification Integration	0.921	0.020	0.921	45.875	0.000

Overall, the findings demonstrate that gamification integration is a significant predictor of student motivation among undergraduate students at UPSI.

7. Discussion

7.1 Gamification Integration in Teaching and Learning

The findings indicate that students perceived the level of gamification integration in teaching and learning at UPSI to be high. Respondents reported positive perceptions of gamification elements, particularly instructional clarity, activity design, contextual relevance, reward systems, and competitive features. These findings suggest that students generally accept and value gamified learning environments as part of their educational experience. The findings are consistent with previous studies that identified gamification as an effective approach for creating more engaging and interactive learning environments in higher education (Sailer & Homner, 2020; Dichev & Dicheva, 2023).

Previous research has shown that clear goals, immediate feedback, and structured progression systems contribute positively to students' learning experiences and participation in educational activities. The present study supports these observations by demonstrating that students respond positively when gamification elements are incorporated into teaching and learning activities in a structured manner. The findings also suggest that gamification

should be viewed as more than a technological enhancement. Its effectiveness appears to depend on the extent to which game elements are meaningfully integrated into instructional activities and aligned with learning objectives. This supports contemporary perspectives that emphasise pedagogically driven rather than technology-driven approaches to gamification.

7.2 Gamification and Student Motivation

The primary objective of this study was to examine the influence of gamification integration on student motivation. The regression analysis revealed a strong and statistically significant positive relationship between gamification integration and student motivation. The findings indicate that students who perceived higher levels of gamification integration also reported higher levels of motivation towards teaching and learning activities. These findings are consistent with previous studies that reported positive effects of gamification on student motivation in higher education (Sailer & Homner, 2020; Li et al., 2024). The results also support the assumptions of Self-Determination Theory (SDT), which posits that motivation is enhanced when learners experience autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2017).

Through features such as challenges, feedback mechanisms, achievement systems, and interactive learning activities, gamification may contribute to the fulfilment of these psychological needs, thereby strengthening students' motivation to participate in learning activities. The strong positive relationship identified in this study suggests that gamification can be an effective pedagogical strategy for enhancing student motivation within higher education. The findings further indicate that students are more likely to engage enthusiastically with learning activities when educational experiences are interactive, structured, and supported by meaningful feedback.

7.3 Pedagogical Implications

The findings have several implications for higher education practice. First, lecturers should consider integrating gamification elements into teaching and learning activities to enhance student motivation. However, gamification should not be implemented solely through points, badges, or rewards. Instead, game elements should be aligned with learning objectives and incorporated into meaningful learning experiences. Second, institutions should provide appropriate support and training to enable lecturers to design and implement effective gamified learning activities.

Effective gamification requires careful instructional planning to ensure that game elements support learning rather than merely increasing participation. Finally, the findings support the broader adoption of student-centred and technology-enhanced learning approaches in higher education. As universities continue to embrace digital transformation, gamification may serve as a useful strategy for promoting student motivation and creating more engaging learning environments.

8. Suggestions for Future Research

Several limitations of the present study provide opportunities for future research. First, the study was conducted at a single public university, which may limit the generalisability of the findings. Future studies should involve students from multiple public and private higher education institutions to provide broader evidence regarding the effectiveness of gamification in different educational contexts. Second, this study employed a quantitative cross-sectional design. Future researchers may adopt mixed-methods approaches by combining surveys with interviews or focus group discussions to obtain deeper insights into students' experiences and perceptions of gamified learning environments.

Third, the present study focused exclusively on the relationship between gamification integration and student motivation. Future research could examine additional outcomes, such as student engagement, satisfaction, academic performance, and learning effectiveness, to develop a more comprehensive understanding of the impact of gamification in higher education. Finally, longitudinal studies are recommended to examine whether the positive motivational effects of gamification can be sustained over time. Such studies would provide valuable evidence regarding the long-term effectiveness of gamification as a pedagogical strategy in higher education.

9. Conclusion

This study examined the influence of gamification integration on student motivation in teaching and learning among undergraduate students at Universiti Pendidikan Sultan Idris (UPSI). The findings revealed a high level of gamification integration and demonstrated a strong positive and statistically significant relationship between gamification integration and student motivation. The regression analysis further confirmed that gamification integration is a significant predictor of student motivation, indicating that students who perceive higher levels of gamification integration are more likely to report higher levels of motivation towards learning activities.

The findings support the assumptions of Self-Determination Theory, suggesting that gamified learning environments can enhance students' motivation by providing opportunities for achievement, feedback, participation, and meaningful learning experiences. The study therefore contributes empirical evidence to the growing body of literature on gamification in higher education, particularly within the Malaysian context. Although the study provides valuable insights, its findings should be interpreted in light of certain limitations, including its focus on a single institution and its cross-sectional research design. Nevertheless, the results suggest that gamification can serve as an effective pedagogical strategy for enhancing student motivation and supporting more engaging teaching and learning experiences in higher education.

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