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The Effect of Gamification on Learning Engagement among Undergraduate Students: The Moderating Role of Attitude

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Abstract

In the realm of higher education, gamification, which is a term that describes the incorporation of game-like aspects into non-game settings, has become an increasingly popular method. The reason for its popularity is its potential benefits, such as increasing student motivation, raising engagement, and ultimately improving learning outcomes. This approach, which involves applying game-design elements and game principles in non-game contexts, aims to foster greater immersion and interaction within educational settings (Alnuaim, 2024). Indeed, research consistently suggests that heightened engagement within any learning environment correlates positively with improved learning outcomes and academic performance (Kaya & Ercag, 2023). This is particularly relevant in undergraduate education, where maintaining student motivation and participation can be challenging due to various factors such as increased autonomy and diverse learning styles (Chen & Liang, 2022).

However, despite widespread acceptance of gamification's benefits in fostering motivation and learning, empirical evidence supporting these claims remains equivocal, particularly regarding its influence on deeper cognitive and affective aspects of engagement

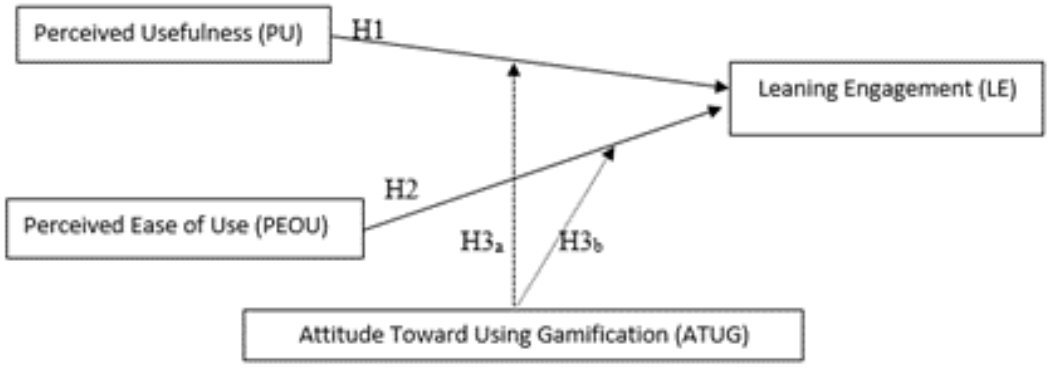
(Rivera & Garden, 2021). Thus, understanding the mechanisms through which gamification influences learning engagement, especially among undergraduate students, is crucial for its effective implementation (Baah et al., 2024; Rayan & Watted, 2024).

In addition, the individual attitudes of students towards gamified learning interventions may critically moderate the efficacy of such approaches, influencing their receptiveness and subsequent engagement levels (Thongmak, 2018). For instance, students' predispositions towards technology-enhanced learning or their intrinsic motivation to engage with novel pedagogical strategies could significantly alter the impact of gamified elements (Wulan et al., 2024). Therefore, this study aims to investigate how the effect of gamification on learning engagement among undergraduate students with the moderating role of attitude toward gamification. Technology Acceptance Model have been applied to examine the relationship between Perceived Ease of Use (PEOU) and Perceived Usefulness (PU among undergraduate students with the moderating role of Attitude toward Using Gamification (ATUG).

Tobon et al. (2020) discovered that TAM is one of the most widely accepted theoretical explanations for why gamification is effective. This model has demonstrated that people's intentions to embrace technology-assisted learning are influenced by two fundamental beliefs, PU and PEOU (Nasir et al., 2021 and Alnuaim, 2024). A system is more likely to be used if people think it will be helpful. Perceived Usefulness (PU) had a substantial impact on students' behavioural intention to adopt gamification in several studies conducted in Malaysia (Othman, 2023; Zainudin, 2023; and Roslan, 2023). Perceived Ease of Use (PEOU) on the other hand is the degree to which people think a certain technology is effortless to use. It refers to how people perceived the technology's level of complexity. In the context of game-based learning, it concerns how simple students think it is to use and navigate the platforms and materials. For instance, students are more likely to accept and engage with game-based learning if they believe it to be user-friendly. Secondary school students stated that online applications such as Kahoot and Quizizz's are attractive, interactive, easy to use, and engaging (Abd. Rahman, 2023).

This study also intended to explore the moderator effect of Attitude toward use Gamification (ATUG) on PU and PEOU towards Learning Engagement (LE) among the students. Attitudes are typically measured using self-reported instruments that capture dimensions such as interest, motivation to learn more, participation in group work, confidence, and classroom dynamics. In general, students tend to exhibit positive attitudes toward gamified learning environments, though results remain somewhat mixed across contexts (Jdaitawi et al., 2025). Learning engagement is a multi-dimensional construct that captures the quality and intensity of students' involvement with learning activities. In contemporary higher-education research, engagement has been examined both in face-to-face and online/gamified environments. From the literature, learning engagement is fostered not only by technological affordances (usefulness, ease of use) but also by how students appraise and receive those affordances emotionally and cognitively.

Figure 1: Conceptual Framework Adapted from TAM



Based on Figure 1 above, this study is to investigate the relationship between PU and PEOU on the LE as well as the moderating influence of ATUG. This study suggested a conceptual framework employing TAM and therefore, the following hypotheses were proposed:

H1: Perceived Usefulness (PU) has a significant positive relationship with Learning Engagement (LE).
H2: Perceived Ease of Use (PEOU) has a significant positive relationship with Learning Engagement (LE).
H3a: Attitude toward Using Gamification (ATUG) moderates the relationship between PU and LE.
H3b: Attitude toward Using Gamification (ATUG) moderates the relationship between PEOU and LE.

This study used quantitative research design to model the effect of gamification towards learning engagement of undergraduate students with attitude as a moderating factor. A total of 228 set of questionnaires were successfully collected online via Google Forms to maximize participation and reach a wider group of undergraduates in Universiti Tunku Abdul Rahman (UTAR). The target population of this study were undergraduate students who were of age between 18 - 28 years old as they were part of Gen Z who were familiar with gamified learning tools and digital learning environment (Prensky, 2021). In addition, this study used judgmental sampling as it was considered suitable as the study population were undergraduate students who were the target population with most exposed to elements of gamification in learning environment.

The data analysis was conducted using SPSS to achieve the research objectives and test the hypotheses developed. These include respondent demographic analysis, descriptive statistics, reliability analysis, normality analysis, correlation analysis, multiple regression analysis, and hypothesis testing. A total of 262 questionnaires were distributed and 228 questionnaires were successfully collected, representing a response rate of 87.02%. Reliability analysis was conducted using Cronbach's Alpha to assess the internal consistency of the measurement items. Table 1 shows the reliability analysis results for all variables. The

Cronbach's Alpha values ranged from 0.884 to 0.900, which exceeded the minimum threshold value of 0.70. Therefore, all variables demonstrated good internal consistency and reliability.

Table 1: Reliability Analysis

Variable	Number of Items	Cronbach's Alpha
Perceived usefulness (PU)	5	0.900
Perceived ease of use (PEOU)	5	0.884
Attitude (ATUG)	5	0.898
Learning engagement (LE)	5	0.899

Multiple regression analysis was conducted to determine the effect of the independent variables (PU and PEOU) on the dependent variable (LE). The regression model produced an R-Square value of 0.670, indicating that 67% of the variance in LE can be explained by PU and PEOU, and both variables are good predictors of LE ($F = 231.311$, $p < 0.05$).

Table 2: Summary of Hypothesis Testing Results

Dependent Variable	Independent Variables	Beta (β)	t-value	Significant (p-value)	Result
Learning Engagement (LE)	Perceived Usefulness (PU)	0.450	8.581	0.000	H1-Supported
	Perceived Ease of Use (PEOU)	0.442	8.355	0.000	H2-Supported
	Moderator (ATUG x PU)	0.556	6.650	0.000	H3a-Supported
	Moderator (ATUG x PEOU)	0.319	3.814	0.000	H3b-Supported

Based on Table 2, the results indicate that PU and PEOU have significant positive effects on Learning Engagement (LE) with p-values of 0.000 ($p<0.05$). The findings suggest that undergraduate students who perceive gamification as useful and easy to use are more likely to actively participate and engage in their learning activities. Thus, H1 and H2 are supported. Moderation analysis was also conducted to examine whether ATUG moderates the relationship between both independent variables (PU and PEOU) and LE. The multiple regression analysis result shows an R-Square value of 0.732, indicating that 73.2% of the variance in LE can be explained by PU and PEOU after adding ATUG as the moderator.

The moderation analysis further revealed that the interaction effect between Attitude Towards Using Gamification (ATUG) and independent variables PU and PEOU are significant with t-values of 6.650 and 3.814 respectively and p-values of 0.000 ($p<0.05$). ATUG is a good moderator of PU and PEOU in predicting LE since the p-value is less than 0.05, which specifies that ATUG significantly moderates the relationship between both independent variables (PU and PEOU) and LE.Therefore, H3a and H3b are supported. These findings demonstrate that students' positive attitudes towards gamified learning environment significantly strengthen the relationships between PU, PEOU and LE. Students are more likely to engage in the learning process actively when they perceive the systems are beneficial and easy to use.

The findings of this study demonstrate that both PU and PEOU significantly influence learning engagement among undergraduate students in a gamified learning environment. The results are consistent with the Technology Acceptance Model (TAM) which explain that users are more likely to use a technology if they perceive it as useful and easy to use. The current findings of PU are consistent with prior studies by Othman (2023) and Zainudin (2023), which similarly revealed that perceived usefulness positively influences students' engagement and intention to adopt gamified learning platforms. Students tend to engage more in the learning activities when they believe that gamification can improve their learning performance and experience. The use of points, badges, rewards and leader boards may create a more interactive learning environment and may encourage students to participate more actively in academic activities. Moreover, students are more likely to use the system when they perceive the gamified platform as user-friendly and uncomplicated. This result is in line with previous studies conducted by (Abd. Rahman, 2023) and (Mohd. Zainudin, 2025).

The moderation analysis also revealed that attitude significantly strengthens the relationships between PU, PEOU and learning engagement. Positive attitudes may enhance students' willingness to explore and use gamification and increase their participation in the learning process. In summary, the findings highlight the importance of integrating effective and user-friendly gamification strategies in higher education to improve students' learning engagement. Educators and educational institutions may also consider to implement gamified learning approaches that are easy to use and capable to foster positive student attitudes towards learning technologies besides providing useful learning experiences. This study supports earlier findings by Ali, Abbas, and Sabiri (2021) and (Bai, Hew, & Huang, 2020; Ekici, 2021).

In conclusion, this research intended to find the effect of gamification on learning engagement among undergraduate students and the individual attitudes of students towards gamified learning intervention influence their intereset and engagement level hence moderate the efficacy of such approaches. Applying strategic integration of game elements is believed to boost learning engagement among the undergraduate students, especially when they find it beneficial and easy to use. Finally, this relationship is further strengthened by students' positive attitudes towards gamification, highlighting the importance of fostering favorable student perceptions towards gamified learning environments.

Keywords:
Gamification; Learning Engagement; Technology Acceptance Model; Attitude; Higher Education

References

Abd Rahman, M. J., Ishak, N. S., Noor, D., & Omar, A. (2023) The Impact of Interactive Applications

Ali, A., Abbas, L., & Sabiri, A. (2021). Effectiveness of gamification learning in students' achievement for complex number topic. Online Journal for TVET Practitioners, 6(2), 108–122. https://doi.org/10.30880/jtet

Alnuaim, A. (2024). The impact and acceptance of gamification by learners in a digital literacy course at the undergraduate level: randomized controlled trial. *JMIR Serious Games*, *12*, e52017.

Baah, C., Govender, I., & Subramaniam, P. R. (2024). Enhancing Learning Engagement: A Study on Gamification's Influence on Motivation and Cognitive Load. *Education Sciences*, *14*(10), 1115. https://doi.org/10.3390/educsci14101115

Bai, S., Hew, K., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis. Educational Research Review, 30, 100322. https://doi.org/10.1016/j.edurev.2020.100322

Chen, J., & Liang, M. (2022). Play hard, study hard? The influence of gamification on students' study engagement. *Frontiers in Psychology*, *13*, 994700.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

Ekici, M. (2021). A systematic review of the use of gamification in flipped learning. Education and Information Technologies, 26(3), 3327–3346. https://doi.org/10.1007/s10639-020-10414-4

Jdaitawi, M., Kan'an, A., El-Sayed, N., et al. (2025). Exploring university students' perceptions and their attitudes towards gamified learning. *International Journal of Information and Education Technology,* *15*(6), 1219–1225. https://doi.org/10.18178/ijiet.2025.15.6.2325

Kaya, O. S., & Ercag, E. (2023). The impact of applying challenge-based gamification program on students' learning outcomes: Academic achievement, motivation and flow. *Education and Information Technologies*, *28*(8), 10053-10078.

Mohd Nasir, F. D., Hussain, M. A. M., Mohamed, H., Mohd Mokhtar, M. A., & Abdul Karim, N. (2021). Student Satisfaction in Using a Learning Management System (LMS) for Blended Learning Courses for Tertiary Education. *Asian Journal of University Education*, *17*(4), 442. https://doi.org/10.24191/ajue.v17i4.16225

Othman, N. A. F., Jaini, A., Ismail, M., Zainoddin, A. I., Mohamad Radzi, S. F., & Kaliani Sundram, V. P. (2023). Gamification in online learning: A case study among university students in malaysia. *Asian Journal of University Education (AJUE)*, *19*(2), 282-293.

Prensky, M. (2021). *Digital natives, digital immigrants - Part 1 & 2* (Updated ed.). In *Digital Natives, Digital Immigrants* (pp. 1-11). SAGE Publications.

Rayan, B., & Watted, A. (2024). Enhancing Education in Elementary Schools through Gamified Learning: Exploring the Impact of Kahoot! on the Learning Process. *Education Sciences*, *14*(3), 277. https://doi.org/10.3390/educsci14030277

Rivera, E. S., & Garden, C. L. P. (2021). Gamification for student engagement: a framework. *Journal of further and higher education*, *45*(7), 999-1012.

Roslan, R. (2023). *Factors influencing continuance of usage intention towards a gamified e-quiz mobile application among Malaysian higher learning students* (Doctoral dissertation, School of Graduate Studies, Universiti Putra Malaysia).

Thongmak, Mathupayas. "Raising students' cognitive engagement intention in a preliminary is course using gamification." *International Conference on Research and Practical Issues of Enterprise Information Systems*. Cham: Springer International Publishing, 2018.

Tobon, S., Ruiz-Alba, J. L., & García-Madariaga, J. (2020). Gamification and online consumer decisions: Is the game over?. *Decision Support Systems*, *128*, 113167.

Wulan, Dyah Retno, et al. "Exploring the benefits and challenges of gamification in enhancing student learning outcomes." *Global International Journal of Innovative Research* 2.7 (2024): 1657-1674.

Zainudin, Z. A., & Zulkiply, N. (2023). Gamification in learning: Students' motivation and cognitive engagement in learning business using Quizizz. *Asian Journal of University Education (AJUE)*, *19*(4), 823-833.