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The Role of Perceived Usefulness and Attitude in Student Engagement: A Conceptual Study in Malaysian Blended Learning Environment

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Abstract: The implementation of blended learning across Malaysian higher education, particularly after the COVID-19 outbreak, has placed student engagement and active involvement at the centre of instructional priorities. This conceptual paper explores gamification as a potential strategy for enhancing engagement, emphasizing perceived usefulness as a critical determinant. This study was guided by the Gamification Acceptance Model (GAM), an adaptation of the Technology Acceptance Model (TAM). Purposive sampling will be applied to recruit respondents who have prior experience using gamification in education. Expected results demonstrate that perceived usefulness exerts a significant influence on three engagement dimensions: attitude, skill engagement, and interaction engagement. These findings will affirm the applicability of GAM in blended learning contexts, while highlighting the value of perceived usefulness in directly promoting learner engagement. The study offers practical recommendations for educators and higher education institutions to integrate gamification into course design, aiming to develop effective and engaging learning experiences.

Keywords: *Gamification; Higher Education; Gamification Acceptance Model; Technology Acceptance Model.*

1. Introduction

Over the past decade, higher education has changed a lot, so student engagement has become very important for universities everywhere. Traditional lecture-based teaching, which used to be the main method, is now doubted because it does not meet the needs of today's students (Byusa, Kampire, & Mwesigye, 2022; Platz, 2022). With more blended learning and students who are comfortable with technology, new methods like gamification are seen as useful for making learning more personal, interactive, and focused on students (Feng, Shen, Xie, & Yan, 2024; Rahman, Ahmad, & Hashim, 2018).

Malaysia's national education policy shows this change. The Malaysia Education Blueprint 2013–2025 makes digitalization a key part of preparing graduates and building skills for the 21st century. Gamification, which uses ideas from games in learning—like points, challenges, and quick feedback—fits well with these goals. These features are meant to keep students interested, help them work together, and improve their thinking skills. Tools like Kahoot!, Quizizz, and STEM competitions show how these methods are changing university teaching in Malaysia. Alnuaim (2024) also showed that students in gamified digital literacy programs did better than those in traditional programs, proving that game-based learning can improve engagement and performance.

Even with these benefits, it is still not clear exactly how gamification affects engagement. Past studies often focus too much on how easy systems are to use and do not look enough at the deeper psychological and teaching aspects. Rahman et al. (2018) said that even though learners like platforms that are easy to use, this does not always mean they will do better in their studies. This shows that we need to look at how gamification affects motivation, participation, and thinking, not just how simple the system is to use.

A common problem in research is mixing up ease of use with educational value, which makes it hard to see how usefulness and students' attitudes affect engagement on their own. To fix this, we need real evidence that separates what motivates students from what just makes things easier. Without this, teachers might make gamified learning settings that do not achieve the learning goals they want.

To address these gaps, this study examines the influence of Gamification Perceived Usefulness (GPU) and Attitude toward Gamification (A) on Skill Engagement (SKE) and Interaction Engagement (IE) among Malaysian higher education students. The scope is expanded to reflect the Malaysian context, where

gamification is increasingly adopted to enhance teaching and learning. Gamification Ease of Use (GEoU) is intentionally excluded to prioritize students' value perceptions over technical simplicity. The study is guided by the Gamification Acceptance Model (GAM), adapted from the Technology Acceptance Model (TAM), and tested using Partial Least Squares Structural Equation Modelling (PLS-SEM). Its objective is to provide practical insights for Malaysian universities on leveraging gamification to strengthen engagement, collaboration, and learning outcomes beyond mere technological novelty.

2. Literature Review

Online Gamification Technique for Higher Education

Generation Z includes people born between 1996 and 2010 (McNeil, 2018). They are seen as the first real digital-native generation. This group grew up when the internet, social media, and mobile technology were everywhere, so they are very used to digital tools (Mahapatra et al., 2022). Their studies are closely linked with technology like Google Drive, Zoom, and other apps for working together, which are now important for teamwork and online learning in higher education.

These students usually want flexible and personal learning, and they prefer classes that use gamified features, mobile apps, and AI tools that give quick feedback (Chicca & Shellenbarger, 2018). They are good at using learning management systems and tech-based platforms that give fast answers and help them work with classmates. Because of this, having strong IT in academic programs is now a must for keeping students interested and helping them learn better. Studies have often shown that ignoring students' digital habits can lower their motivation and involvement, which shows why teaching methods should match students' tech skills (Mohr & Mohr, 2017).

Gamification Acceptance Model (GAM)

This study uses the Gamification Acceptance Model (GAM), first introduced by Rahman et al. (2018), to look at what affects how higher education students accept gamified learning. GAM is based on the Technology Acceptance Model (TAM), but it leaves out Behavioral Intention (BI) and Actual System Usage (U). Instead, it focuses on what students think and feel about gamification.

In this model, two main ideas—Gamification Perceived Usefulness (GPU) and Gamification Ease of Use (GEoU)—are important for shaping how students feel. GPU shows how much students think gamified learning can help them do better in their studies, and GEoU is about how easy they think these tools are to use. Together, these ideas decide if students will like or dislike gamification. This model helps teachers design gamified lessons that are good for learning and easy to use, so students are more likely to accept and take part in them in higher education.

Skill Engagement (SKE)

Skill engagement means the ways students act and think to help themselves learn better, like taking notes, solving problems, and using what they have learned (Handelsman et al., 2005). This kind of engagement shows both inner motivation—where students want to learn for themselves—and outside goals, like getting rewards for good work. Schnitzler et al. (2021) and Wong and Liem (2022) say skill engagement is key for gaining the skills needed to succeed in school and work. Mauidloh et al. (2024) also describe it as students keeping involved in tasks that build specific skills through effort and not giving up.

Research often shows that gamification helps students get more involved in building their skills. Domínguez et al. (2013), for example, found that adding game features like progress bars and point systems made students take part more and feel more motivated in skill-based courses such as programming and engineering. Rahman et al. (2018) also said that 96% of students in their study thought gamified platforms were good for keeping attention and taking notes during lectures. More research supports these results. Subhash and Cudney (2018) found that gamification made students enjoy their work more, which led them to try harder and keep going. In the same way, Taşkın and Kılıç Çakmak (2022) saw that game challenges helped students think deeply, work together, and solve problems. Personalized gamification, where tasks match what students are motivated by using systems like Hexad, also works well. Lopez and Tucker (2021) say that matching gamified tasks to each student's preferences helps them keep trying and learn better, especially when learning on their own.

Interaction Engagement (IE)

Interaction engagement means how willing and how much effort students put into working with their classmates and teachers about course content (Handelsman et al., 2005; Mauidloh et al., 2024). This kind of engagement is not just about studying alone but also joining in discussions, group work, and solving problems together. Gamification features like leaderboards, badges, and team challenges are often said to boost this type of engagement by building a feeling of community and friendly competition among students.

Research supports the good effect of gamification on students working together. For example, Hamid and Barzenji (2024) found that game-based learning helps students take part more by giving clear goals and quick feedback. In the same way, Bouchrika et al. (2021) found that gamified methods help students work together, talk more, and build social links, which helps them learn better.

However, keeping this engagement going can be hard. Some studies show a "novelty effect," where students are excited at first about gamified tasks but lose interest later. Hanus and Fox (2015) saw that student motivation dropped over a 16-week gamified course, showing that the fun of game features might not last if they are not used well. Also, too much or badly planned gamification can distract students instead of helping them. Mogavi et al. (2022), for example, found that language-learning apps like Duolingo sometimes focus too much on game parts and not enough on real learning, calling this "gamification misuse."

Perceived Usefulness and Attitude

Many studies show a strong link between how useful students think a platform is and how much they join in skill-based activities in online and blended learning. Zhu et al. (2022) found that during the COVID-19 pandemic, students in higher education who thought online platforms were useful took part more in study activities and joined in more. These results show that students' thoughts about how useful a platform is affect not just if they want to use it, but also how much effort they put into their work.

Li and Salleh (2024) found the same in a review about blended learning. They found that when students see value in hybrid learning, they get more involved in thinking and feel more interested in skill-building activities. Chen et al. (2025) also showed how important perceived usefulness is in mobile learning, where things like fast feedback, easy access, and interactive tools keep students engaged over time. Together, these studies suggest that perceived usefulness not only starts motivation but also helps students keep working on and improving the skills they need to do well in their studies.

Perceived Usefulness and Skill Engagement

Extensive research highlights a strong correlation between perceived usefulness and students' engagement in skill-oriented activities within online and blended learning contexts. Zhu et al. (2022) reported that during the COVID-19 pandemic, higher education learners who regarded online platforms as useful exhibited increased engagement in study strategies and active participation. These findings demonstrate that students' evaluations of platform utility influence not only their willingness to use the technology but also their behavioral commitment to academic tasks.

Similar conclusions were drawn by Li and Salleh (2024) in a systematic review on blended learning effectiveness. The authors found that learners' perceptions of value in hybrid environments directly contributed to both cognitive involvement and emotional investment in skill-based learning activities. Further evidence by Chen et al. (2025) underscores the role of perceived usefulness in mobile learning contexts, where features such as instant feedback, easy accessibility, and interactive tools sustained learners' engagement and practice over time. Collectively, these findings suggest that perceived usefulness not only drives initial motivation but also maintains persistence in applying and refining skills essential for academic success.

Perceived Usefulness and Interaction Engagement

The link between perceived usefulness and interaction engagement is well known in blended and tech-supported learning. In a review, Vlachopoulos and Makri (2017) found that game-based learning helps students learn and also increases teamwork, communication, and working together—skills that matter for doing well in school and work. How much students value these systems is very important for keeping them interested in joining group activities.

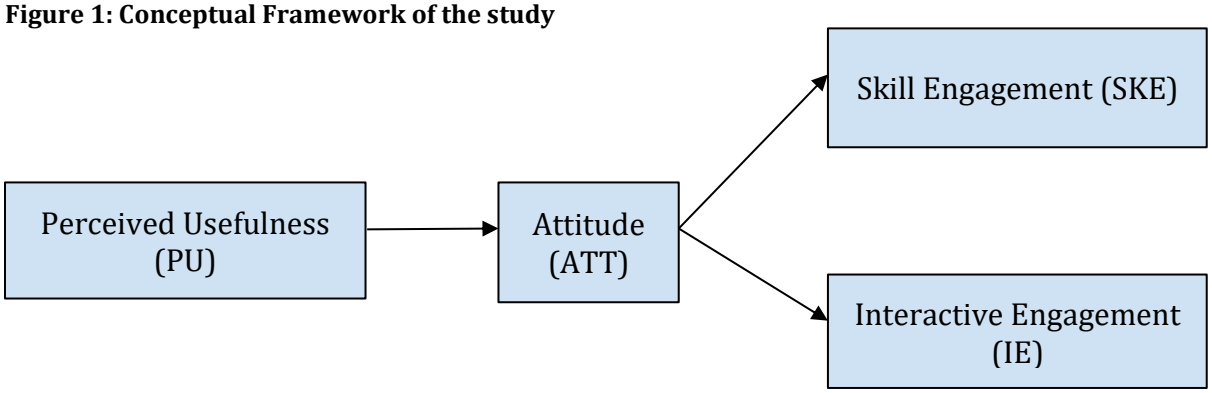
Xie et al. (2024) also found that students who thought working with classmates and group discussions were helpful took part more in forums and shared learning spaces. These results show that students' views about usefulness are not just about learning alone but also about the social benefits of working with others. Supporting this, Wang et al. (2022) said that students with good digital skills and experience using online tools were more likely to see working together as valuable, so they joined in more group activities. Together, these studies show that perceived usefulness is a main reason students take part in activities that require them to work with others, so it is very important when planning good gamified and blended learning.

Hypotheses Development and Conceptual Framework

Drawing upon the literature reviewed, this study proposes that perceived usefulness significantly shapes learners' attitudes toward gamification and, in turn, their behavioral engagement. A strong positive association is expected between perceived usefulness and both skill-based and interaction-oriented engagement. Additionally, attitude is hypothesized to act as a mediating variable in these relationships, explaining the psychological mechanism through which perceived usefulness influences engagement outcomes.
Accordingly, the following hypotheses are formulated:
H1: Perceived usefulness positively influences attitude.
H2: Perceived usefulness has a positive effect on skill engagement.
H3: Perceived usefulness positively impacts interaction engagement.
H4: Attitude mediates the relationship between perceived usefulness and skill engagement.
H5: Attitude mediates the relationship between perceived usefulness and interaction engagement.

The conceptual framework guiding this research is presented in Figure 1. Based on the extended Gamification Acceptance Model (GAM), which is derived from the Technology Acceptance Model (TAM), the framework positions perceived usefulness as the primary predictor of both attitude and engagement dimensions. Attitude serves as an intermediary construct, linking perceived usefulness with skill and interaction engagement, thereby providing a theoretical foundation for the study's empirical analysis.

Figure 1: Conceptual Framework of the study



3. Methodology

Sampling and Population

This study used a quantitative, cross-sectional design to examine how Gamification Perceived Usefulness (GPU) and Attitude Toward Gamification (A) influence two dimensions of engagement: Skill Engagement (SKE) and Interaction Engagement (IE). Guided by the Gamification Acceptance Model (GAM), the relationships were tested using Partial Least Squares Structural Equation Modelling (PLS-SEM). The minimum sample size requirement was determined using G*Power analysis, ensuring that the number of respondents exceeded the threshold recommended for models with fewer than seven constructs, thereby providing a solid basis for the analysis.

Questionnaire Development

Data will be collected using a questionnaire with several items rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). This type of scale was chosen because it helps reduce response bias and makes

the results more accurate. To get more students to join and make it easier, the survey was given online and could be used on both phones and computers.

Statistical Technique

Partial Least Squares Structural Equation Modelling (PLS-SEM) will be used to test the study's ideas. SEM is different from normal regression because it lets researchers look at complex links between hidden variables at the same time (Chan, 2001). This makes it good for studies with many constructs, each shown by several indicators, and needing to check both the measurement and structural models together.

4. Expected Findings

The expected results of this research should give useful information about how gamification can help student engagement in higher education. Perceived usefulness will likely have a strong effect on students' attitudes towards gamified learning and on both skill engagement and interaction engagement. These ideas match earlier studies that showed perceived usefulness is a key reason for how learners behave in technology-based settings (Ali et al., 2022; Zhu et al., 2022).

Attitude is also expected to be an important link in these relationships, showing how perceived usefulness affects student engagement. This idea fits with past research, which shows that positive attitudes make the effects of technology acceptance stronger (Norazlina et al., 2020). So, students who see gamification as useful and have good attitudes are likely to take part more and work better with others.

Also, earlier studies by Xie et al. (2023) and Teo and Noyes (2011) suggest that students who see real value in gamified tools usually join in more with interactive learning. This supports the positive links expected in this study. Together, these results should help develop ideas about gamification and give practical tips for designing blended learning that boosts engagement by using value-based gamification.

5. Conclusion and Recommendations

This paper argues that the perceived usefulness of gamification is a key reason for student engagement in blended learning. The model suggests that perceived usefulness strongly shapes students' attitudes, which then affect how they join in with others. While attitude may not have a big effect on skill engagement, it does help students work together, showing the mental side that supports how students act.

The analysis also expects that perceived usefulness will have a direct positive effect on both skill and interaction engagement. These ideas fit with past studies showing the motivational value of perceived usefulness in tech-supported learning (Allehaidan & Wan Zainon, 2024; Ambikapathy et al., 2024). Earlier research also shows that a well-made gamified system not only improves academic results but also makes students more committed to learning by making activities interactive and fun.

Overall, the model in this study gives a good base for future research to confirm these ideas. By using gamification based on perceived usefulness and positive attitudes, universities can create blended learning that encourages active involvement, supports working together, and helps students achieve better results.

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