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Students' Acceptance of Gamification: A Case Study In FBM, UiTM Kampus Alor Gajah

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Abstract

Nowadays, it fosters a lighthearted atmosphere conducive to learning and can improve students' academic performance. As a result, learning through gamification has become one of lecturers' most popular strategies and approaches in today's classrooms. This study examines the determinants that affect students' acceptance of gamification among FBM students in UiTM, Kampus Alor Gajah. A sample of 248 diploma students was selected using proportionate stratified random sampling. Data were analysed using Statistical Package for Social Science (SPSS). The results showed a moderate positive relationship between all three independent variables (performance expectancy, social influence and perceived enjoyment) and students' acceptance of gamification, with performance expectancy having the most decisive influence.

Keywords: Gamification, Performance Expectancy, Social Influence, Perceived Enjoyment, UTAUT, TAM

Introduction

In recent years, there have been significant technological advancements that have significantly impacted people's daily lives. These innovations have simplified tasks such as shopping, communication, entertainment, and learning. Among the most notable advancements is the rise of gaming. Games have become integral to people's lives and are now commonly used in various contexts, such as the workplace, education, and healthcare. The use of games in these contexts has proven effective in promoting engagement and participation, which are essential for success. As a result, gamification has emerged, which involves incorporating game design elements into non-gaming activities (Hamari et al., 2015). These elements include rewards, competition, progress tracking, and feedback. Gamification

has proven to be an effective tool for motivating individuals to achieve their goals and improve their performance in various areas of life. It has been particularly beneficial in the education sector, which has been used to enhance student engagement, motivation, and learning outcomes.

"Gamification" was first introduced in 2008, but it only gained popularity and started being applied in curriculum design in 2010 (Reiners et al., 2012). Gamification utilizes game mechanics, and users can experience these games in a digital environment. The primary purpose of gamification is to inspire and motivate individuals to achieve their goals, and it may also improve their learning performance. According to Nah et al (2013) by introducing engaging elements of video games into educational practices and activities, gamification can increase students' interest in studying. Even though today's students have grown up with computers and video games, gamification strategies are rarely used in the classroom. Erenli (2013) argues that today's young students have gaming skills that, if utilized more effectively in academic settings, might significantly improve their learning experiences. The "Bingo game" is a form of gamified learning that has been shown to improve memory and analytical reasoning. The potential of gamification in numerous disciplines is also demonstrated by some web apps, such as Eco Island (which supports CO2 reduction via social influence).

According to Juho Hamari et al (2014) gamification has gained considerable attention since its emergence in 2010 and has been studied in various fields, including education and training, well-being, and marketing. The traditional approach to learning and teaching is no longer sufficient with the advancement of technology. One-way teaching methods are no longer engaging for students who require more interaction with their lecturers. Despite this, most professors still teach university students using standard conventional teaching and learning methodologies (Mulryan-Kyne, 2010). These challenges have prompted many scholars to investigate modern learning techniques more appropriate for this technological era to ensure effective teaching and learning.

Numerous studies have explored the integration of gamification in education to tackle the challenges of traditional learning methodologies. Gamification leverages game design elements, such as rewards, competition, and progress tracking, to inspire and motivate learners and potentially enhance their engagement, motivation, and performance in learning. This approach has gained significant attention. Some educators have recommended using game-based learning that can be done online instead of traditional approaches, such as textbooks, to foster effective learning.

While previous studies have mainly focused on the effectiveness of incorporating game design elements in certain learning situations, further research is necessary to determine students' attitudes towards gamification in online learning environments and their intentions to use gamification in their study environment (Chung et al., 2019). Accordingly, to close the research gap this study aims to identify the determinants influencing students' acceptance of gamification in their learning environment. As gamification continues to gain popularity as an educational tool,

this study is very crucial because it can help educators design more effective gamified learning environments, increase student motivation and engagement, enhance student learning outcomes, and develop a more comprehensive understanding of gamification in education. with the goal of identifying effective strategies for promoting student engagement, motivation, and learning outcomes.

Furthermore, gamification and interactive learning are particularly relevant for the millennial generation, who prioritize physical, digital, and biological elements advocated by the 4.0

industrial revolution and highlighted by emerging technologies like Cyber-Physical Systems (CPS). This research investigated using the Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model (TAM) models. The objectives of the study are as stated below:

- To examine the determinants that affect students' acceptance of gamification among FBM students.

Literature Review

Gamification

"Gamification" refers to engaging and motivating people, fostering learning, and resolving problems using game-based mechanics and game thinking (Buckley & Doyle, 2014). Additionally, gamification refers to incorporating game design features into non-gaming contexts (Schobel et al., 2020). More precisely, gamification in education involves applying game-based mechanics and visual and game judgment to engage and motivate learners, advance learning, and work out setbacks and difficulties (Kapp, 2012).

As today's students may not be interested in participating in traditional educational activities, gamification in education has become increasingly crucial (Tamrin et al., 2022). If used appropriately, gamification in the classroom can significantly benefit students, improving their performance. In addition, students of all learning types can benefit from gamified lessons because they actively engage with learning materials that integrate game aspects (Arockiyasamy et al., 2016).

To properly implement gamification, three essential aspects need to be considered: firstly, understanding the target audience (i.e., students); secondly, determining the objective; and finally, applying appropriate game aspects to stimulate students to take action (Aparicio et al., 2012). However, there are several reasons why students may object to using gamification technologies, such as unclear learning objectives or unfamiliarity with the games (Browne et al., 2014). Therefore, to enhance the effectiveness of gamification in education, instructors need to understand the key factors that impact students' acceptance of this approach.

Underline Theory

Technology Acceptance Model (TAM)

Davis (1989) developed the technology acceptance model (TAM), which has become the most widely used research model for determining and predicting individuals' acceptance and use of information systems and technology (Kim, 2008). TAM has been extensively studied and validated in various information system contexts.

Venkatesh & Davis (2000) introduced an updated version of the Technology Acceptance Model (TAM), known as TAM2, which added new variables to the original model. Later, Viswanath Venkatesh and Bala (2008) developed TAM3 and, along with others, proposed the Unified Theory of Acceptance and Use of Technology (UTAUT) model, which was published in MIS Quarterly. In this study, the TAM was adopted as the theoretical model, with perceived enjoyment serving as the primary independent variable.

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

The unified theory of acceptance and use of technology model (UTAUT) was developed by Venkatesh et al (2003) and derived from eight previous models of technology acceptance. The UTAUT model emphasizes four main determinants of intention to use and use behavior,

focusing on the intent to use and user behavior towards information technologies (Venkatesh et al., 2003). Many types of research have used the UTAUT model to investigate user technology acceptance, and it has received empirical support for different kinds of technology (Abdel-Wahab, 2008; Tagoe, 2012). The current study utilized the UTAUT theoretical model, incorporating two key independent variables: performance expectancy and social influence.

Variables of the Study

Performance Expectancy

Performance expectancy refers to how students believe using gamification in their learning can enhance their academic performance (Vleeshouwer, 2015). Regarding the UTAUT Model, Viswanath Venkatesh et al (2003) outlined performance expectancy as an individual's belief based on the advantages, they gain from using the system and the technologies to be more helpful.

Based on a previous study by Tamrin et al (2022) indicates that performance expectancy had a significant and positive impact on university students' acceptance of gamification in their studies. These findings align with a similar study conducted by Chung et al (2019), which also reported that performance expectancy had the strongest effect on student's intention to use gamification compared to other variables. In addition, students who perceived that gamification could enhance their learning capabilities were likelier to adopt and utilize this approach than those who held a contrary view.

A previous study conducted by Mahande & Malago (2019) on a Postgraduate Program at University Negeri Makassar, Indonesia, showed that performance expectancy significantly and positively impacted students' behavioural intention to accept e-learning. Similarly, the present study aimed to identify factors contributing to the acceptance of gamification in education. Based on the research objectives, the following hypothesis was formulated:

H1: Performance expectancy significantly affects students' acceptance of gamification.

Social Influence

In general, social influence refers to the action and reaction that is affected by others through an individual. Peer pressure, family pressure, advertising, and other factors can reflect social influence. Social power refers to the extent to which an individual perceives the significant opinions of others, such as family or friends, that could influence their decision to adopt a new system (Alraja, 2015). According to AlMarshedi et al (2017) social factors may have a stronger influence on the adoption of gamification than technological factors. Social behaviors, particularly in collectivist cultures, can impact a user's opinion, acceptance, and gamification performance.

According to Tamrin et al (2022) study, social influence did not significantly impact students' acceptance of gamification in their academic studies. However, Vanduhe (2020) research indicated that social influence played a role in influencing the intention to use gamification for training purposes in higher education.

In addition, Latip et al (2020) study found that social influence positively impacted students' acceptance of e-learning in their academic studies. Thus, the following hypothesis was formulated.

H2: Social influence significantly affects students' acceptance of gamification.

Perceived Enjoyment

Enjoyment refers to the inherent satisfaction and pleasure derived from the use of technology, as defined by (Davis et al., 1992). This pleasure is considered an intrinsic reward, which differs from extrinsic motivation in that it comes from within oneself rather than from external factors. According to (Venkatesh & Davis, 2000), perceived enjoyment refers to how much users find a specific system enjoyable for its own sake, independent of any outcomes it may produce. This aligns with the idea that enjoyment is an intrinsic motivator, as opposed to external rewards, as defined by (Deci et al., 1999). Gamers, who place high value on enjoyment, are more likely to continue engaging in activities that they find enjoyable.

Zainoddin et al (2022) found in their previous research that perceived enjoyment is a significant and positive factor in influencing students' acceptance of gamification in education. Additionally, Filippou et al (2018) found that enjoyment is one factor that significantly affects students' preference to use gamification in their learning environment. Therefore, the following hypothesis was formulated

H3: Perceived enjoyment significantly affects students' acceptance of gamification.

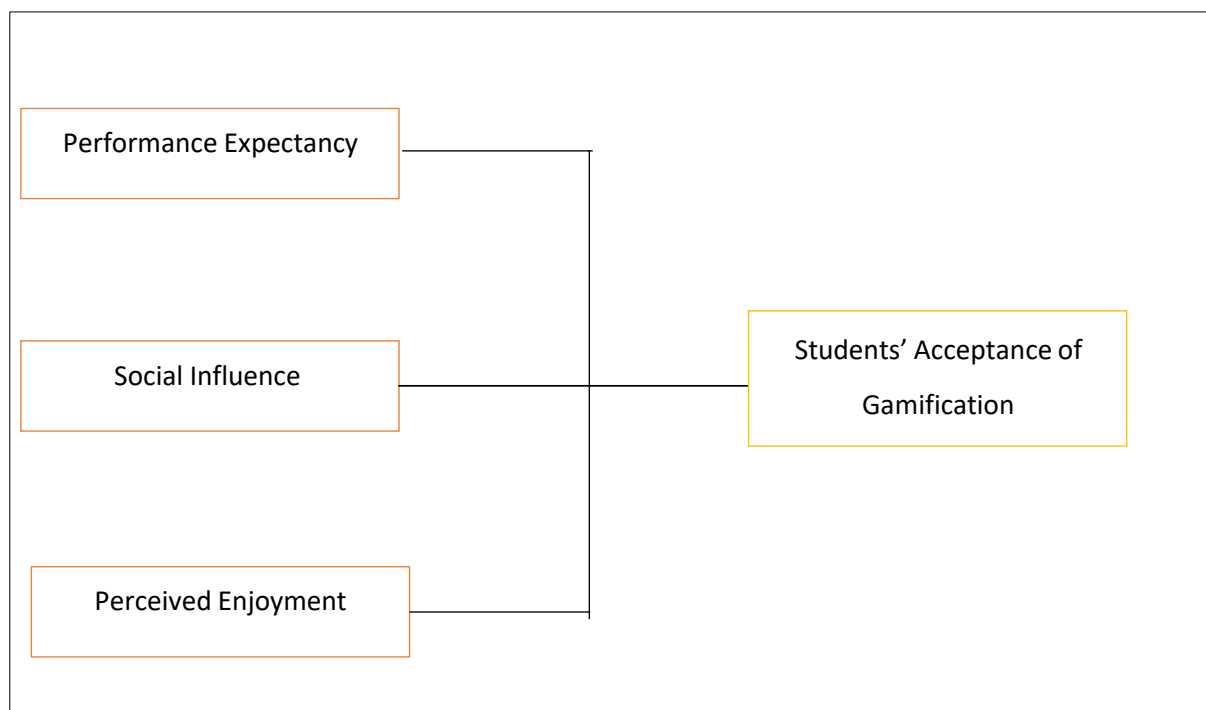


Figure 1: Framework

Methodology

This study examines the determinants that affect students' acceptance of gamification among FBM students in UiTM, Kampus Alor Gajah. The study utilized primary data from a questionnaire distributed to the target respondents and secondary data from relevant articles and journals. To achieve this, the researcher employed proportionate stratified random

sampling, which involves selecting members from each stratum in proportion to the total number of elements in the representative strata.

The population of interest for this study comprises 700 fifth-semester students pursuing a diploma in the Faculty of Business Management at UiTM, Kampus Alor Gajah. To ensure the generalizability of the findings, a minimum sample size of 248 was determined using Krejcie & Morgan, (1970) table. After data screening, a total of 248 valid responses were obtained.

The variable indicators were measured using a 5-point Likert scale, where each statement presented respondents with five possible responses, ranging from "strongly agree" to "strongly disagree." The Likert scale was treated as an interval scale to facilitate data analysis and interpretation (Sekaran et al., 2016)

Respondents' Profile

The descriptive analysis results indicate that most respondents were female (81.5%), while 18.5% were male. Regarding age, the vast majority of respondents (98.0%) fell between 18 and 21, with only 1.6% belonging to the age range of 22-25 years. Additionally, a mere 0.4% of respondents were between the ages of 26 and 29.

Data Analysis and Result

The model summary table 1 shows that the R² value for the independent variables, performance expectancy, social influence, and perceived enjoyment, was 0.497, indicating that these variables explain 49.7% of the variance in students' acceptance of gamification. However, other factors may not be considered in this study that could explain the remaining 50.3% of the variance in students' acceptance of gamification. Although the independent variables examined in this study significantly predict students' acceptance of gamification, other factors may also influence this outcome.

The t-test results show that all three independent variables, performance expectancy, social influence, and perceived enjoyment, are significant predictors of students' acceptance of gamification. Furthermore, the p-values for each variable were below the significance level of 5%, indicating positive relationships between each variable and students' acceptance of gamification.

The results of the F-test indicate that the linear model is statistically significant, with an F value of 80.423 and a p-value below 0.05. Therefore, there is a significant relationship between the independent variables and students' acceptance of gamification.

The standardized beta coefficient results showed that all variables positively and significantly impacted students' acceptance of gamification. Hypothesis 1 was supported with a significant value of 0.000 and a beta value of 0.383 for performance expectancy. Hypothesis 2 was also accepted with a significant value of 0.013 and a beta value of 0.148 for social influence. Similarly, Hypothesis 3 was supported with a significant value of 0.000 and a beta value of 0.296 for perceived enjoyment. Therefore, all hypotheses were supported, indicating that performance expectancy, social influence, and perceived enjoyment positively and significantly influence students' acceptance of gamification.

Table 1

Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.211	1.532		2.096	.037
Performance Expectancy	.596	.097	.383	6.144	.000
Social Influence	.158	.063	.148	2.499	.013
Perceived Enjoyment	.438	.083	.296	5.280	.000
F-value	80.423				
Sig.	.000				
Adjusted R ²	.491				
R ²	.497				

Discussion

The study's findings demonstrated that all three independent variables - performance expectancy, social influence, and perceived enjoyment - statistically impact students' acceptance of gamification in their learning. Among these factors, the data indicated that performance expectancy was the most important predictor, significantly influencing students' acceptance of gamification. These results highlight the importance of considering performance expectancy in designing and implementing gamified learning environments to enhance student motivation and engagement.

A study conducted by Tamrin et al (2022) reported similar findings, highlighting that performance expectancy was the most significant factor influencing students' acceptance of gamification compared to other variables. The results indicate that when students believe that gamification can enhance their academic performance, they are more inclined to adopt it. Moreover, according to Chung et al (2019), performance expectancy was found to have the most decisive positive influence on student's intention to use gamification compared to other factors. This reinforces the significance of ensuring that gamification aligns with students' perceived performance to enhance their learning experience effectively.

Furthermore, the study results indicated that social influence significantly impacts students' acceptance of gamification, which is consistent with previous research by Chung et al (2019) reported that social influence significantly affects students' acceptance of gamification when it is implemented. Likewise, Vanduhe (2020) found that social influence affects the intention

to use gamification for training in higher education. These findings suggest that the influence of others may play a critical role in motivating students to use gamification in their studies.

Lastly, the finding also found that perceived enjoyment significantly impacts students' gamification acceptance. The results demonstrated that students who enjoy using gamification tools are more likely to accept their use as a valuable tool for learning. This result is consistent with previous research, such as the study conducted by Filippou et al (2018), which found that enjoyment is crucial in motivating students to use gamification in their learning. This could be because when students find the gamification experience enjoyable, it enhances their motivation and engagement, leading to improved learning outcomes. Furthermore, enjoyment can also positively impact the emotional aspect of students' learning experiences, making it a more enjoyable and memorable experience. Therefore, incorporating enjoyable elements into gamification strategies may increase student acceptance and improve learning outcomes.

Conclusion

The study examined determinants students' acceptance of gamification. According to the findings, students' acceptance of gamification is based on performance expectancy, social influence and perceived enjoyment. In addition, educational institutions and teachers must employ engaging and interactive methods of instruction that encourage student participation and reduce anxiety. This is especially important in economically developing nations like Malaysia, where students are becoming comfortable with digital technology and want the same level of accessibility and exposure in their education as they enjoy in their personal lives. Institutions can adapt to students' changing needs and expectations in today's technologically advanced world by adopting gamification strategies.

To offer an engaging learning experience, lecturers can leverage popular gamification apps like Kahoot and Quizizz or design their interactive platforms. It is essential to ensure that the gamification activities selected offer benefits that appeal to all students, irrespective of their gender or background, to promote inclusivity and equitable learning outcomes. Additionally, to enhance the effectiveness of gamification in learning, institutions must provide state-of-the-art equipment in the classroom, such as computers, projectors, and interactive whiteboards, and ensure that they are well-maintained and updated. Besides, reliable high-speed internet access is crucial to support simultaneous usage by multiple users and prevent disruptions in the learning process.

Moreover, institutions should invest in regular training and professional development programs for their faculty and staff to ensure they are equipped with the necessary skills to implement gamification strategies in the classroom effectively. By doing so, the institution can foster an engaging and stimulating learning environment that promotes student success and academic achievement.

Limitations and Future Studies

The study has several limitations that need to be addressed in future research. Firstly, the sample size was limited to only semester five students from a single Malaysia public higher education institution, which may restrict the generalizability of the findings. Future research should include students from different educational levels and countries to obtain a more comprehensive outcome.

Secondly, the independent variables used in the study could only account for 49.7% of the variance in the dependent variable (students' acceptance of gamification). This implies that other factors, such as effort expectancy and facilitating conditions, may also impact students' gamification use. Hence, it is necessary to investigate these factors further to gain a more comprehensive understanding of their influence on student acceptance of gamification.

Lastly, the study did not consider any mediating variables. Therefore, future research should incorporate future research into the study design to investigate the potential mediation effects of variables such as student engagement on the relationship between the independent variables and students' acceptance of gamification.

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