The Role of Perceived Ease of Use and Usefulness in Students' Adoption of Gamification Technologies: Evidence from Malaysia

Noor Saatila Mohd Isa[1]*, Norliana Omar[2], Sunarti Halid[3], Norhayati Sulaiman[4], PM Dr. Rahayu Abdul Rahman[5]

[1]Faculty of Accountancy, University Teknologi MARA, Selangor Branch, Puncak Alam Campus, 42300 Puncak Alam, Selangor, Malaysia

[2,3,4,5]Faculty of Accountancy, Universiti Teknologi MARA, Perak Branch, Tapah Campus, 35400, Tapah Road, Perak, Malaysia

***Corresponding Author**

DOI: https://doi.org/10.47772/IJRISS.2026.1013COM0018

Received: 28 April 2026; Accepted: 05 May 2026; Published: 23 May 2026

ABSTRACT

This study applies to the Technology Acceptance Model (TAM) to explore the factors shaping students' intentions to adopt gamification tools in educational settings. Specifically, it investigates how perceived ease of use and perceived usefulness influence the adoption intentions of 137 undergraduate accounting students from a public university in Malaysia. Using SmartPLS for analysis, the results reveal that perceived usefulness strongly impacts students' behavioral intention, while perceived ease of use does not show a significant effect. The research validates the TAM within the Malaysian context and offers valuable insights for both academic research and practical applications in the adoption of technology in higher education.

Keywords: Perceived usefulness, perceived ease of use, behavioural intention, gamification app, TAM theory

INTRODUCTION

Gamification involves incorporating game elements into non-game settings, offering various strategies to apply game principles in different contexts. The rising popularity of gamification, driven by its positive outcomes and growing interest in using games for education, has become increasingly evident in recent years (Toda et al., 2019). Gamified learning, in particular, has long been recognized for its potential to improve educational experiences (Rodríguez et al., 2018; Ding et al., 2018).

In education, gamification has gained significant attention for its ability to engage students actively in the learning process. As a motivational tool, it enhances academic performance, sharpens problem-solving skills, and supports social and cognitive development (Başal & Kaynak, 2020; Martí-Parreño et al., 2021). By integrating game design elements into both digital and traditional environments, gamification creates dynamic and enjoyable classroom experiences (Martí-Parreño et al., 2021). This approach boosts student engagement, making learning more interactive and enjoyable while enabling personalized learning and continuous feedback.

Research highlights that student acceptance is critical for successfully implementing technology-enhanced learning environments (Venkatesh & Bala, 2008; Zacharis, 2012). Understanding the barriers to acceptance is crucial for successfully integrating gamification tools into educational settings (Biesta et al., 2015; Kaimara et al., 2021; Sánchez-Mena & Martí-Parreño, 2017) because students seek diverse learning experiences and have varying learning styles (Colling et al., 2022; Pfost & Artelt, 2018). Due to that, gamified learning environments address these needs by offering engaging and motivating educational experiences (O'Connor & Menaker, 2008).

However, gamification apps face several challenges that must be addressed. The complexity of game mechanics can impact usability, possibly hindering user engagement and adoption. There are also concerns about whether

these apps truly enhance educational value or if the focus on game elements may overshadow learning objectives. Moreover, the reliance on extrinsic rewards could diminish intrinsic motivation to learn. Equity and accessibility may become issues if apps fail to accommodate diverse learning needs or varying levels of digital literacy. Data privacy and security also remain important considerations. These challenges highlight the need for careful design and implementation to ensure gamification apps are effective and inclusive.

This study tackles the challenge of understanding what influences diploma students' intentions to use gamification apps in their educational settings. It specifically examines how students' perceptions of a gamification app's ease of use and usefulness impact their willingness to adopt and continue using the app. By using the Technology Acceptance Model (TAM), the study analyzes how these perceptions shape students' engagement with and integration of gamification tools into their learning routines. TAM is essential for this research, as it offers a solid framework to evaluate how user perceptions influence technology adoption. Understanding these factors is key to creating effective gamified educational tools that align with students' needs and preferences, ensuring successful adoption and positive impact.

The remainder of the paper is structured as follows: The next section reviews relevant literature on students' behavioral intentions toward gamification. The third section discusses the research methodology. The fourth section presents the findings and empirical results. The final section concludes the study.

LITERATURE REVIEW

The idea of bringing game elements into non-game settings started gaining traction in the early 2000s, and by the 2010s, the term "gamification" became more common (Deterding et al., 2011). This shift was driven by technological advances and the rise of social media, which highlighted how adding game-like features could boost engagement in all areas (Zichermann & Cunningham, 2011). In education, this approach means incorporating things like points, badges, and leaderboards into learning to help motivate and engage students (Hamari et al., 2014). It's all about making learning more interactive, encouraging students to get involved and perform better (Kapp, 2012). Gamification can spark more motivation through fun challenges, offer a richer learning experience with quick feedback, and even create personalized learning paths that work for different types of students (Deterding et al., 2011). But it's not without its issues. The tools can sometimes be complicated and hard to use, and relying too much on rewards might kill the natural motivation to learn. The concern is that these tools might not work well for every student, especially if they have different learning needs or tech skills (Hamari et al., 2014).

Hypotheses Development

This study aims to develop a model based on TAM theory to explain the factors influencing diploma students' intentions to use gamification tools in their classes and provide a broader perspective. The proposed model for understanding diploma students' intentions to use gamification tools in classes is shown in Figure 1. Diploma students are the focus of this study because they are at a critical stage in their education. Adopting new technologies and learning tools can have a big impact on their academic success and motivation. This group often has a mix of needs and varying levels of digital skills, making them an ideal group to explore how perceived ease of use and perceived usefulness affect their engagement with gamification apps. By focusing on diploma students, the study aims to offer useful insights into how these factors shape their adoption of new learning technologies, which can help design more effective and user-friendly educational tools that meet their specific needs and learning environments.

Using the Technology Acceptance Model (TAM) theory in this study is important for understanding how diploma students perceive and interact with gamification tools. TAM offers a solid framework for looking at the perceived ease of use and perceived usefulness of technology, which are key factors in whether diploma students accept and intend to use new tools. By applying TAM, this study can closely examine how these factors impact diploma students' willingness to adopt gamification tools, providing a clearer picture of their adoption process. This approach also helps identify specific barriers and motivators related to using educational technologies, leading to the development of more tailored solutions that can boost diploma students' engagement and academic success.

Perceived usefulness and gamification behavioural intention

Perceived usefulness, as defined by Davis, Bagozzi & Warshaw (1989), refers to individuals' beliefs about how much a specific system or application can improve their performance. When it comes to gaming apps, users are more likely to want to use the app if they believe it serves a clear purpose and enhances their gaming experience. This belief in the app's usefulness influences how users view its value and its ability to help them achieve gaming goals or simply enjoy the experience. A strong positive relationship between perceived usefulness and behavioral intention suggests that users are more likely to engage with and keep using a gaming app when they see it as beneficial for their gaming activities. Additionally, perceived usefulness plays an important role in the adoption of technology across various areas, influencing users' willingness to use applications, as shown in studies on gamification tools and mobile technology (Alharbi & Drew, 2014; Yang & Wang, 2019; Hsu & Lu, 2007; Leng & Lada, 2011; Yoo et al., 2017). Similar attention has been given to the impact of perceived ease of use on attitudes and intentions in studies within mobile medical and educational fields (Wu & Wang, 2005; Lin & Chuang, 2017). Based on this, the following hypothesis is proposed:

H1. Perceived usefulness has a significant influence on intention towards using gamification app.

Perceived ease of use and gamification behavioural intention

Understanding the relationship between the intention to use a gaming app and how easy it is to use is key to figuring out how users adopt new technology. Perceived ease of use, according to Davis, Bagozzi & Warshaw (1989), refers to how simple and hassle-free users believe using a particular technology is. For gaming apps, users who find the app easy to use and navigate are more likely to express a positive intention to keep using it. There's a strong positive link between perceived ease of use and behavioral intention, meaning that users who find a gaming app easy to manage are more likely to keep using it and engage with it actively. This highlights how important it is for apps to have a simple design and easy interactions when users are deciding whether to download and stick with them. Additionally, existing research supports the idea that users' attitudes and behaviors toward adopting technology are influenced by how easy they think it is to use. Studies by Yang & Wang (2019), Hsu & Lu (2007), and Alharbi & Drew (2014) all show this connection. Similarly, Sadaf et al. (2016) found that pre-service teachers' positive views on adopting Web 2.0 tools were shaped by how easy they perceived the tools to be, which in turn affected their intention to adopt and the usefulness they saw in the technology. This idea can also apply to diploma students, suggesting they're more likely to accept and continue using gamification tools if they find them easy to use. Based on this, the following hypothesis is proposed:

H2. Perceived ease of use significantly influences intention towards using gamification app.

METHODS

This study collected data through a questionnaire survey, which was personally distributed to undergraduate accounting students during the second semester of the 2023 academic year. Focusing on undergraduate accounting students is important because they often deal with a demanding and complex curriculum that requires high levels of engagement and a strong understanding of detailed concepts. Gamification has the potential to improve their learning experience by making challenging material more interactive and motivating. This group's specific educational needs and career-focused skills make them ideal for exploring how gamification apps can enhance learning outcomes and help manage academic stress. Additionally, as accounting education continues to integrate more technology, understanding how these students interact with gamified tools offers valuable insights into their effectiveness in a tech-driven learning environment. To ensure voluntary participation and honest responses, students were assured of confidentiality and informed that their answers would only be used for this research. A total of 137 valid responses were gathered and used for analysis.

In this study, random sampling was used to select participants from undergraduate students in Part 3 through Part 5 who were enrolled in Malaysian Financial Reporting Standards (MFRS) in Financial Accounting and Reporting (FAR) courses. This approach was chosen to ensure every student in this specific group had an equal chance of being included, which helps ensure the findings accurately reflect their experiences with MFRS coursework. While this method provides a strong representation of students at different academic levels, it's

important to note that the results may not be fully applicable to students at earlier stages or those studying other disciplines.

The questionnaire was divided into two sections: demographic information and the TAM model and behavioral intention. The first section gathered demographic details, including gender, age, and academic performance. The second section aimed to measure respondents' perceived ease of use and perceived usefulness about their behavioral intention to use a gamification app, using a Likert scale from 1 to 5: 1 = Strongly Disagree, 2 = Disagree, 3 = Moderately Disagree, 4 = Agree, and 5 = Strongly Agree. The data collected was analyzed using Partial Least Squares (PLS) to assess the relationships between variables and evaluate the model's validity and reliability.

RESULTS AND DISCUSSION

Respondents' Profile

This study collected the demographic profile of 137 respondents (Table 1). The respondents were all diploma students from one of public university in Malaysia, UiTM Perak Branch, Tapah Campus. The sample consisted of 34 (24.82%) male and 103 (75.18%) females. 125 (91.24%) of the respondents were aged 20 years old and above.

Table 1: Demographic Characteristics of Respondents

Characteristics	Items	Frequency	Percentage (%)
Gender	Male	34	24.82%
	Female	103	75.18%
Age	18-19	12	8.76%
	20 and above	125	91.24%
Academic Performance (CGPA)	3.50 and above	68	49.64%
	3.00-3.49	53	38.69%
	2.50-2.99	13	9.49%
	2.00-2.49	3	2.19%
	Less than 2.00	0	0%

Assessment of the Measurement Model

The data from the questionnaire was analyzed using Smart PLS, a two-step approach which involves evaluating both the measurement and structural models. The measurement model examines the relationship between items and constructs, while the structural model explores the relationship between exogenous and endogenous constructs in the research model. Table 2 shows the measurement model, which must meet the criteria for internal consistency reliability, convergent validity and discriminant validity. Internal consistency reliability is to ensure the consistency of results across items, while convergent validity is tested to ensure that multiple items measuring the same concept agree with each other. To assess the internal consistency reliability and convergent validity of the measurement model, the loadings, composite reliability (CR), and average variance explained (AVE) were evaluated. Hair et al. (2017) recommend that the loading, AVE, and CR values should be at least 0.6, 0.5, and 0.7, respectively, to establish convergent validity. Table 2 demonstrates that the reliability and convergent validity of the construct was satisfactory as the loading, AVE, and CR values exceeded the recommended values. The loading varied from 0.828 to 0.958, AVE ranged from 0.833 to 0.888, and CR ranged from 0.961 to 0.975, indicating that convergent validity was achieved.

Fornell and Larcker's method was used to evaluate discriminant validity by determining whether all the constructs were free from unidimensionality. Table 3 shows that the square value of AVE was greater than the correlation between the constructs, indicating that the model met the recommended requirements, and discriminant validity was confirmed for all the constructs in the study.

Table 2: The Measurement Model Assessment

Constructs	Measurement items	Loadings	Cronbach's α	CR	AVE
Behavioural Intention	BI1	0.94	0.956	0.968	0.882
	BI2	0.958			
	BI3	0.948			
	BI4	0.912			
Perceived Ease of Use	PEOU1	0.945	0.969	0.975	0.888
	PEOU2	0.936			
	PEOU3	0.939			
	PEOU4	0.941			
	PEOU5	0.951			
Perceived Usefulness	PU1	0.913			
	PU2	0.828			
	PU3	0.933	0.949	0.961	0.833
	PU4	0.936			
	PU5	0.949			

Table 3: Discriminant Validity of Measurement Model Using Fornell and Larcker

Constructs	Behavioural Intention	Perceived Ease of Use	Perceived Usefulness
Behavioural Intention	0.939		
Perceived Ease of Use	0.692	0.942	
Perceived Usefulness	0.734	0.933	0.955

Assessment of the Structural Model

After the measurement model had been validated, a structural model analysis was conducted to test the two hypotheses. In the assessment of the structural model, the direction of the beta value, the significance level of the t-values and p-value were examined, as suggested by Hair et al. (2017). A bootstrapping procedure with resampling of 5,000 was performed to test the direct effect. Figure 1 depicts the structural model of this study. Table 4 provides the results of hypotheses testing. Specifically, in *H1* it was hypothesized that perceived ease of use would have a positive influence on behavioural intention. The results showed positive but insignificant relationship (β= 0.034, t = 0.281, $p < 0.05$). Therefore, *H1* was not supported. Finally, regarding H2, in which it was hypothesized that likeability would positively influence customer loyalty, the results showed that likeability had a positive influence on the dependent variable (β= 0.703, t = 3.497, $p < 0.01$), and thus *H2* was also supported.

Table 5 presents the values of the coefficient of determination (R^2) and effect size (f^2) of the exogenous variables on the endogenous variable. The R^2 value represents the amount of variance in the endogenous construct explained by all the exogenous constructs in the research model. As can be seen from the table, the R^2 was 0.539, which denoted that the exogenous variables (perceived ease of use and perceived usefulness) explained 53.9% of the variance in the endogenous variable (behavioural intention).

As regards the effect size, f^2, this represents the value of R^2 that is changed when a specific construct is omitted from the model. Following Cohen (1988), the impact of the effect size was judged to be small if the value of f^2, was 0.02, medium if it was 0.15 and large if it was 0.35. The results in Table 5 indicate that the supported exogenous variables (perceived ease of use), f^2, = 0.001 and (perceived usefulness), f^2, = 0.13 had a small effect size, respectively on the endogenous variable.

Table 4: Structural Model Assessment and Hypothesis Testing

Hypothesis	Relationship	Beta	SD	t value	p value	Decision
H1	Perceived ease of use -> Behavioral intention	0.034	0.214	0.281	0.779	Rejected
H2	Perceived usefulness -> Behavioral intention	0.703	0.194	3.497	0.000	Supported

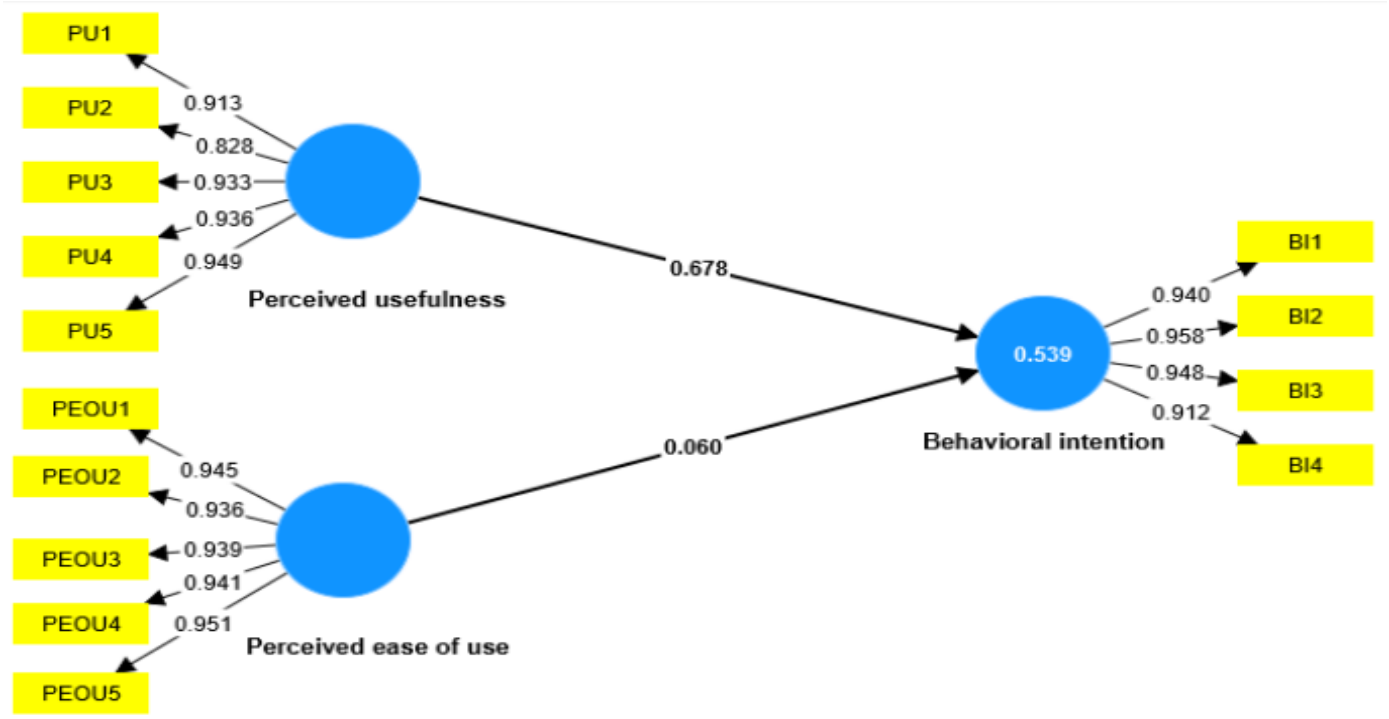

Figure 1. Path Model (TAM Model)

Table 5: Result of R^2 and f^2

Construct	R^2	f^2	Decision
Behavioural Intention	0.539		
Perceived Ease of Use		0.001	Small
Perceived Usefulness		0.13	Small

CONCLUSION

In conclusion, this study set out to explore the factors that influence diploma students' intentions to use gamification tools in their classes using the TAM framework. The findings showed that while perceived usefulness had a significant impact on students' intention to use gamification apps, perceived ease of use did not play a major role. This suggests that students are more focused on the perceived benefits and practicality of gamification tools rather than how easy they are to use when deciding whether to adopt them. These results deepen our understanding of students' attitudes and behaviors towards gamification in educational settings. Additionally, the analysis of the structural model highlighted that perceived usefulness strongly affected students' behavioral intentions, emphasizing the need to focus on the benefits and practicality of gamification tools in educational environments. Overall, the study highlights the importance for educators and institutions to emphasize the advantages and functionalities of gamification tools to boost student engagement and improve learning outcomes in today's digital learning landscape.

However, this study has some limitations. The sample size is relatively small, as it only involved students from one public university in Malaysia. As a result, these findings may not apply to the broader population. Future research should address this limitation by including a larger and more diverse sample from various institutions to increase the validity of the findings. Additionally, future studies could explore other factors like perceived ease of use and individual differences and employ longitudinal or qualitative methods to gain deeper insights

into how students' interactions with gamification tools change over time. On a practical note, educators should focus on clearly communicating the benefits and real-world applications of gamification tools to encourage student adoption. They should also ensure that these tools are user-friendly and provide adequate training to maximize their effectiveness and engagement in digital learning environments.

REFERENCES

1. Alharbi, S., & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems. International Journal of Advanced Computer Science and Applications, 5(1), 143-155.
2. Başal, A., & Kaynak, N. E. (2020) Perceptions of pre-service English teachers towards the use of digital badges. Innovations in Education and Teaching International, 57(2), 148-162. doi: 10.1080/14703297.2019.1649172.
3. Biesta, G., Priestley, M., & Robinson, S. (2015). The role of beliefs in teacher agency. Teachers and Teaching, 21(6), 624-640.
4. Colling, J., Wollschläger, R., Keller, U., Preckel, F., & Fischbach, A. (2022). Need for cognition and its relation to academic achievement in different learning environments. Learning and Individual Differences, 93, 102110
5. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. Management Science, 35(8), 982-1003
6. Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining" gamification". In Proceedings of the 15th international academic MindTrek conference: Envisioning future media environments (pp. 9-15). Association for Computing Machinery. https://doi.org/10.1145/2181037.2181040
7. Ding, L., Er, E., & Orey, M. (2018). An exploratory study of student engagement in gamified online discussions. Computers & Education, 120, 213–226. https://doi.org/10.1016/j.compedu.2018.02.007.
8. Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. In 2014 47th Hawaii international conference on system sciences (pp. 3025-3034). IEEE. https://doi.org/10.1109/HICSS.2014.377
9. Hsu, C. & Lu, H. (2007). Consumer behavior in online game community: A motivational factor perspective. Computers in Human Behavior, 23(3), 1642-1659.
10. Kaimara, P., Fokides, E., Oikonomou, A., & Deliyannis, I. (2021). Potential barriers to the implementation of digital game-based learning in the classroom: Pre-service teachers' views. Technology, Knowledge and Learning, 26(4), 825-844
11. Kapp, K. M. (2012). The gamification of learning and instruction: Game-based methods and strategies for training and education. John Wiley & Sons.
12. Leng, G., & Lada, S. (2011). An exploration of Social Networking Sites (SNS) adoption in Malaysia using Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB) And Intrinsic Motivation. Journal of Internet Banking & Commerce, 16(2), 1- 27.
13. Lin, C. T., & Chuang, S. S. (2017). Project-based Learning incorporating Interdisciplinary Curriculums Increase Learners' Satisfaction. International Journal of Education and Social Science, 4(9), 29-39
14. Martí-Parreño, J., Galbis-Córdova, A., & Currás-Pérez, R. (2021). Teachers' beliefs about gamification and competencies development: A concept mapping approach. Innovations in Education and Teaching International, 58(1), 84-94, doi: 10.1080/14703297.2019.1683464.
15. O'Connor, D. L., & Menaker, E. S. (2008). Can massively multiplayer online gaming environments support team training?. Performance Improvement Quarterly, 21(3), 23- 41
16. Pfost, M., & Artelt, C. (2013). Reading literacy development in secondary school and the effect of differential institutional learning environments. Schriften der Fakultät Humanwissenschaften der Otto-Friedrich-Universität Bamberg, 229
17. Rodríguez, M., Díaz, I., Gonzalez, E. J., & González-Miquel, M. (2018). Motivational active learning: An integrated approach to teaching and learning process control. Education for Chemical Engineers, 24, 7–12. https://doi.org/10.1016/j.ece.2018.06.003

18. Sadaf, A., Newby, T. J., & Ertmer, P. A. (2016). An investigation of the factors that influence pre-service teachers' intentions and integration of Web 2.0 tools. Educational Technology Research and Development, 64(1), 37-64
19. Sánchez-Mena, A., Martí-Parreño, J., & Miquel-Romero, M. J. (2019). Higher education instructors' intention to use educational video games: An QCA approach. Educational Technology Research and Development, 67, 1455-1478.
20. Toda, A.M., Klock, A.C.T., Oliveira, W. et al. Analysing gamification elements in educational environments using an existing Gamification taxonomy. Smart Learn. Environ. 6, 16 (2019). https://doi.org/10.1186/s40561-019-0106-1
21. Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39(2), 273-315.
22. Wu, J. H., & Wang, S. C. (2005). What Drives Mobile Commerce? An Empirical Evaluation of the Revised Technology Acceptance Model. Information & Management, 42(5), 719-729
23. Yang, Y., & Wang, X. (2019). Modeling the intention to use machine translation for student translators: An extension of technology acceptance model. Computers & Education, 133, 116-126.
24. Yoo, C., Kwon, S., Na, H., & Chang, B. (2017). Factors affecting the adoption of gamified smart tourism applications: An integrative approach. Sustainability, 9, 1-21.
25. Zacharis, N. Z. (2012). Predicting college students' acceptance of podcasting as a learning tool. Interactive Technology and Smart Education, 9(3) (2012), 171-183
26. Zichermann, G., & Cunningham, C. (2011). Gamification by design: Implementing game mechanics in web and mobile apps. O'Reilly Media, Inc.