# The Effect of Gamification on Students' Learning

## Roszi Naszariah Nasni Naseri
Faculty of Business and Management, Universiti Teknologi Mara Melaka, Malaysia
Corresponding Author Email: roszinaseri@uitm.edu.my

## Raja Nazim Raja Abdullah
Faculty of Management and Economics, Universiti Pendidikan Sultan Idris, Malaysia

## Maryam Mohd Esa
Faculty of Business Innovation and Technology, Universiti Melaka, Malaysia

**Abstract**
Gamification technologies have the possibility to alter intentions and behaviours of users by way of exploiting individual and social factors. The application of game elements in a non-game concept can increase user interaction and motivation. Of recent, progress in gamification research in education accentuates the necessity to adapt the gamification design properties to complement students' needs, preference, and characteristics. Henceforth, various studies have been coordinated to customize the gamification to cater for education sector. This research aims to review gamification effect on students' learning.
**Keywords:** Gamification, Review, Education, Support Tool, Teaching, Learning

**Introduction**
The concept of gamification is comparatively new in education field. The gamification concept and mechanics have been progressing rapidly as a business operation in the non-game environment. Previous literature indicated different definitions of gamification concept in which the most used definition is the use of game design elements in non-game contexts (Deterding et al., 2011). In recent years, gamification has gained popularity in various disciplines such as employment (Robson et al., 2016), commerce (Behl et al., 2020), environment Larson (2020), health Randy and Corno (2022), and other areas (Parreño, Ibáñez and Arroyo, 2016). Of late, attention in gamification research in education field increases as reported by (Sailer and Homner, 2020). Gamification concept in education refers to usage of game elements and design techniques that is applied in educational context. Werbach and Hunter (2015) defined the term gamification as application of game design elements as well as game thinking during the state of non-game. Although the act of gamification is closely related to games, it is not exactly the same concept with game designing. For instance, gamification does not deal directly with the game design, but it is more to the techniques that are developed to be used in non-game contexts. Similarly, the concept of gamification applies the game elements for the purpose of motivating people to

conduct certain activities (Alsawaier, 2018). Shang and Lin (2013) affirmed that gamification technology can potentially change intention and behaviour of users by way of manipulating social and individual factors. The gamification technique is generally aimed to escalate the interaction of users. This happens as gamification increases user engagement by influencing the intrinsic motivation while experiencing the game. This is also proven by the study of Dhahak and Huseynov (2020) which asserted that gamification can be considered as a motivational tool in increasing user engagement. Although gamification is now becoming widely accepted in the practical field due to its efficiency in increasing user motivation, the academic research on this issue is still considered to be at infancy level especially in education field (Saleem et al., 2022).

**Objective**
Hence, the aims of this study
* To review and deliberate on gamification effect in education, specifically in teaching and learning process.

**History of Gamification**
As explained by Deterding et al (2011), games and gamification, which is also referred to as gameful design, are two different things altogether. Yet, both terms exist on the similar continuum in their research framework as toys and playful design. Nevertheless, the research of Robson et al (2016) affirmed that gamification is commonly confused with real life simulations, real games, or even game theory although it is totally unrelated to these concepts. As stated by Knaving and Björk (2013), gamification has its own history which stimulates the method to make games more attractive and interesting that attracts people to participate in it. Circa 1980s, various research and projects were conducted on effect of games towards consumer behaviour (Meister et al., 2009). Faber and Faber launched a website called "The Gamification Company" in 2005 which focused on disseminating knowledge by playing games (Faber et al., 2022). A study by Knaving and Bjork (2013) asserted that many people find conventional teaching to be ineffective, hence the application of gamification is seen as a perfect solution in knowledge sharing. The same study also found that conventional teaching is normally based on a materialistic concept, thus it does not provide satisfaction among students. As for the usage of the term gamification, Werbach (2015) argued that the term was first used in the 1980s by Richard Bartle who modified Multi-User Dungeon (MUD) and gamified it on the online platform to enhance user engagement of the system. Meanwhile, Burke (2016) mentioned that the term was created by a British consultant Nick Pelling in 2002. According to Pelling's definition, gamification means to apply game-like accelerated user interface design in order to make electronic transactions to be enjoyable and fast.

**Gamification in Education**
In the context of education, gamification is based on game mechanics, thinking, as well as aesthetics aspect to encourage active participations in learning that will engage students' interest, which will lead the students to be motivated and perform better in their studies. Similarly, gamification from the perspective of education is also known as a technique that fosters dynamic game design in the educational environment. The gamification technique stimulates students' interest and allows the students to have direct interaction that will significantly develop their cognitive, curricular, and their social competencies. Alsawaier

(2018) stated that the gamification technique engages people, motivates their action, as well as promotes learning process and problem-solving skills. These values generate the students will power to achieve tasks' objectives, making projects to be more attractive and also promotes cooperative work, and team effort (Trigueros et al., 2020). Evidently, gamification in education sector has been proven to increase students' motivation in their learning process (Hanus and Fox, 2015). The study of Majuri et al (2018) combined gaming functions with cognitive concept. In recent years, various studies that applied gamification technique in the education area had been conducted. Previous study was also carried out on the transformation of education system to achieve motivational benefits the way games function to human being as well as relating it to investigating the gamification effect on students' learning experience (Seixas et al., 2016; Oliveira et al., 2022). Nonetheless, despite the results of previous studies showing increase in student engagement and motivation after using gamification technique in education (Koivisto and Hamari, 2019; Bai et al., 2020; Sailer and Homner, 2020), there are also studies that revealed the opposite effect of gamification such as discouragement and learning outcome impairment in certain set of students as found in the study of (Hanus and Fox, 2015; Toda et al., 2017; Kwon and Özpolat, 2021). However, it is also noted that quantitative analysis currently available is insufficient to establish the benefits as well as efficiency of using gamification in education field. Undeniably, according to Felicia (2011), gamification technology application attracts student's involvement in education. However, systematization of theoretical knowledge of gamification concept is required along with determination of existing advantages and disadvantages of gamification.

## Conclusion

This research aims to acquire better understanding of the gamification concept in education sector. Based on literature review, it has been evidenced that gamification is advantageous to students by improving their engagement during learning and provides motivation which results in the student's academic achievement. Hence, it can be concluded that technology such as usage of gamification in education sector has assisted to enhance student's interaction. In short, this study bridges the gap in the area of educational motivation research and contributes to the existing literature in education field. This explains the significant attention that gamification has gained in educational context.

## Acknowledgement

## References

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *International Journal of Information and Learning Technology, 35*(1), 56-79.

Bai, S., Hew, K. F., & Huang, B. (2020). Does gamification improve student learning outcome? Evidence from a meta-analysis and synthesis of qualitative data in educational contexts. *Educational Research Review*, *30*, 1-20.

Behl, A., Sheorey, P., Pal, A., Veetil, A. K. V., & Singh, S. R. (2020). Gamification in E-commerce: A comprehensive review of literature. *Journal of Electronic Commerce in Organizations*, *18*(2), 1-16.

Burke, B. (2016). *Gamify: How gamification motivates people to do extraordinary things*. Routledge.

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*, 9-15.

Dhahak, K., & Huseynov, F. (2020). The Impact of Online Consumer Reviews (OCR) on Online Consumers' Purchase Intention. *İşletme Araştırmaları Dergisi*, *12*(2), 990-1005.

Faber, T. J., Dankbaar, M. E., Kickert, R., Van Den Broek, W. W., & Van Merriënboer, J. J. (2022). Identifying indicators to guide adaptive scaffolding in games. *Learning and Instruction*, *83*, 1-9.

Felicia, P. (2011). *Handbook of research on improving learning and motivation through educational games: Multidisciplinary approaches: Multidisciplinary approaches*. iGi Global.

Hanus, M. D., & Fox, J. (2015). Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & education*, *80*, 152-161.

Knaving, K., & Björk, S. (2013). Designing for fun and play: exploring possibilities in design for gamification. In *Proceedings of the first international conference on gameful design, research, and applications*, 131-134.

Koivisto, J., & Hamari, J. (2019). The rise of motivational information systems: A review of gamification research. *International Journal of Information Management*, *45*, 191-210.

Kwon, H. Y., & Özpolat, K. (2021). The dark side of narrow gamification: Negative impact of assessment gamification on student perceptions and content knowledge. *INFORMS Transactions on Education*, *21*(2), 67-81.

Larson, K. (2020). Serious Games and Gamification in the Corporate Training Environment: A Literature Review. *TechTrend*, *64*, 319–328.

Majuri, J., Koivisto, J., & Hamari, J. (2018). Gamification of education and learning: A review of empirical literature. In *Proceedings of the 2nd international GamiFIN conference, GamiFIN 2018*. CEUR-WS.

Meister, A. P., Rand, K. R., & Light, S. A. (2009). Indian gaming and beyond: Tribal economic development and diversification. *SDL Rev.*, *54*, 375.

Oliveira, W., Hamari, J., Shi, L., Toda, A. M., Rodrigues, L., Palomino, P. T., & Isotani, S. (2022). Tailored gamification in education: A literature review and future agenda. *Education and Information Technologies*, 1-34.

Randi, J., & Corno, L. (2022). Addressing student motivation and learning experiences when taking teaching online. *Theory Into Practice*, *61*(1), 129-139.

Robson, K., Plangger, K., Kietzmann, J. H., McCarthy, I., Pitt, L. (2016). Game On: Engaging Customers and Employees through Gamification. *Bus. Horiz. 59*, 1, 29–36.

Rocha Seixas, D. L., Gomes, A. S., & de Melo Filho, I. J. (2016). Effectiveness of gamification in the engagement of students. *Computers in Human Behavior*, *58*, 48-63.

Sailer, M. & Homner, L. (2020). The Gamification of Learning: A Meta-Analysis. *Educ. Psychol. Rev.*, *32*, 77–112.

Saleem, A. N., Noori, N. M., & Ozdamli, F. (2022). Gamification applications in E-learning: A literature review. *Technology, Knowledge and Learning*, *27*(1), 139-159.

Shang, S. S. C., & Lin, K. Y. (2013). An understanding of the impact of gamification on purchase intentions. Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, 1-11.

Toda, A. M., Valle, P. H., & Isotani, S. (2017). The dark side of gamification: An overview of negative effects of gamification in education, Springer, Cham.

Trigueros, R., Aguilar-Parra, J. M., Lopez-Liria, R., Cangas, A. J., Gonzalez, J. J., & Alvarez, J. F. (2020). The role of perception of support in the classroom on the students' motivation and emotions: the impact on metacognition strategies and academic performance in math and English classes. *Frontiers in Psychology*, *10*, 2794.

Werbach, K. (2015). *Kevin Werbach: History of Gamification.* [online] Available at: https://www.coursera.org/course/gamification

Werbach, K., & Hunter, D. (2015). *The gamification toolkit: dynamics, mechanics, and components for the win*. University of Pennsylvania Press.

Werbach, K., Hunter, D., Dixon, W., & Gildan Media, LLC. (2013). For the Win: How Game Thinking Can Revolutionize Your Business. Gildan Media, LLC