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# VIRTUAL SYMPOSIUM ON TEACHING & LEARNING (VSTL) 2020

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**CONTENTS**

**It Is Not About the Treasure, It Is About the Hunt –**

# Engaging Students Through Gamification

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## Abstract

Implementation of the engineering programme has been primarily based on traditional approach to teaching and learning for decades. Nonetheless, immersive classroom learning that actively and cooperatively includes students' participation has been reported to enable them to improve their creativity, problem solving and critical thinking skills, which are required in the top ten skills today. The introduction of gamification of learning is an innovative approach in improving students' opportunities to learn and develop skills through a positive, engaging learning environment. The gamification strategy further seeks to bring about changes in the involvement and success of students in the Food Preservation Technology course. Perceptions and feedback from the students were obtained through questionnaires and reflective assessment. Most students prefer classroom approach with a gamification environment. Gamification creates flexibility and makes the course more enjoyable for both students and instructors.

## Introduction

The effect of gamification on student motivation and performance is important, as there was increased interest in gamification at the college level (Hanus & Fox, 2015). Gamification refers to the use of elements of game design in a non- game setting, while game-based learning refers to the use of games for skills or knowledge acquisition. Points, leaderboards, and badges were the key elements in typical gamification of learning (Barata et al., 2013; Mekler et al., 2013). Other game elements such as avatars, three-dimensional environments, feedback, ranks, levels, competition, and time pressures (Deterding et al., 2011) should also be considered when designing gamification-integrated learning. Learning was effectively encouraged by introduction of games (Annetta et al., 2009; de Freitas, 2010; Liu et al., 2014; Papastergiou, 2009), and was proven to motivate students than non-gaming teaching methods (Barab et al., 2005; Papastergiou, 2009). Many universities and colleges have encouraged to incorporate gamification in classroom session to strategically attract tech-savvy students and increase their engagement. Apart from game-based learning, the use of gamification elements such as goals, rules, and feedback systems to engage students may have an impact on improving their literacy skills.

The objectives of the current study are, (1) to design gamification-integrated classroom activities, and (2) to analyse students' motivation and interest in learning through gamification. The hypothesis was that students taking parts in the Food Preservation Technology course were motivated and more engaged during gamification-integrated learning. Gamification in learning can also lead to deeper discussions with peers and instructors during classroom sessions. Furthermore, when students are actively encouraged to apply their knowledge during classroom sessions, it is also believed that this knowledge will retain better, thereby enabling them to better answer cognitively complex questions during exam (Bouwmeester et al, 2019).

## Materials and Methods

This study was conducted in a Food Preservation Technology course (CBE658) which is an elective course of a 4-year Chemical Engineering program. This course was mostly taught using the incorporation of game-based and gamification of learning. Students were asked to plan their learning by watching recorded videos and reviewing lectures in the online Learning Management System (LMS) which is the UiTM MOOC platform, before face-to-face classroom sessions. Students must gain prior information and knowledge on the topics so active participation could happened during the game-based and gamification in classroom. Padlet and QR Code were used in a gamification session that was designed as a Treasure Hunt. Fig. 1 and Fig. 2 show the tools used in Treasure Hunt integrated as gamification during the learning process.

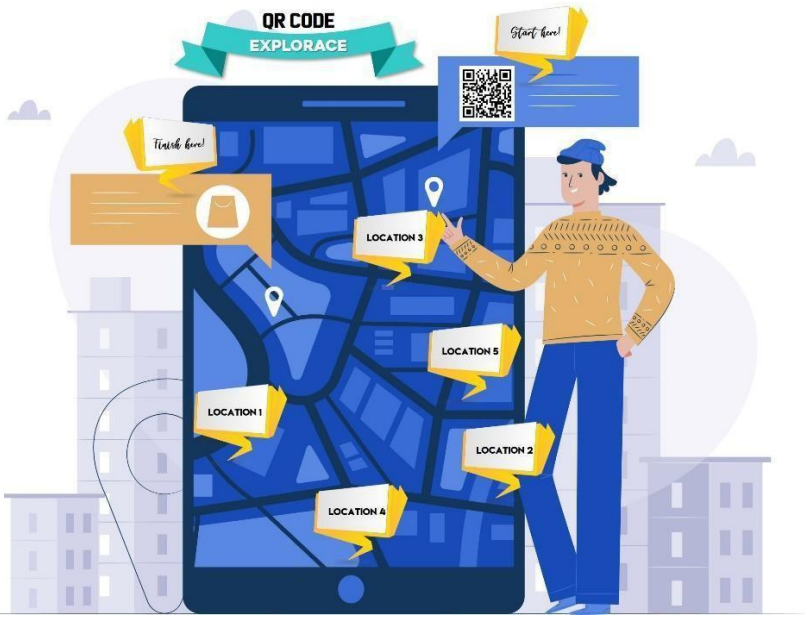


**Fig. 1** Tools used in the gamification setting: QR Code concept for Treasure Hunt

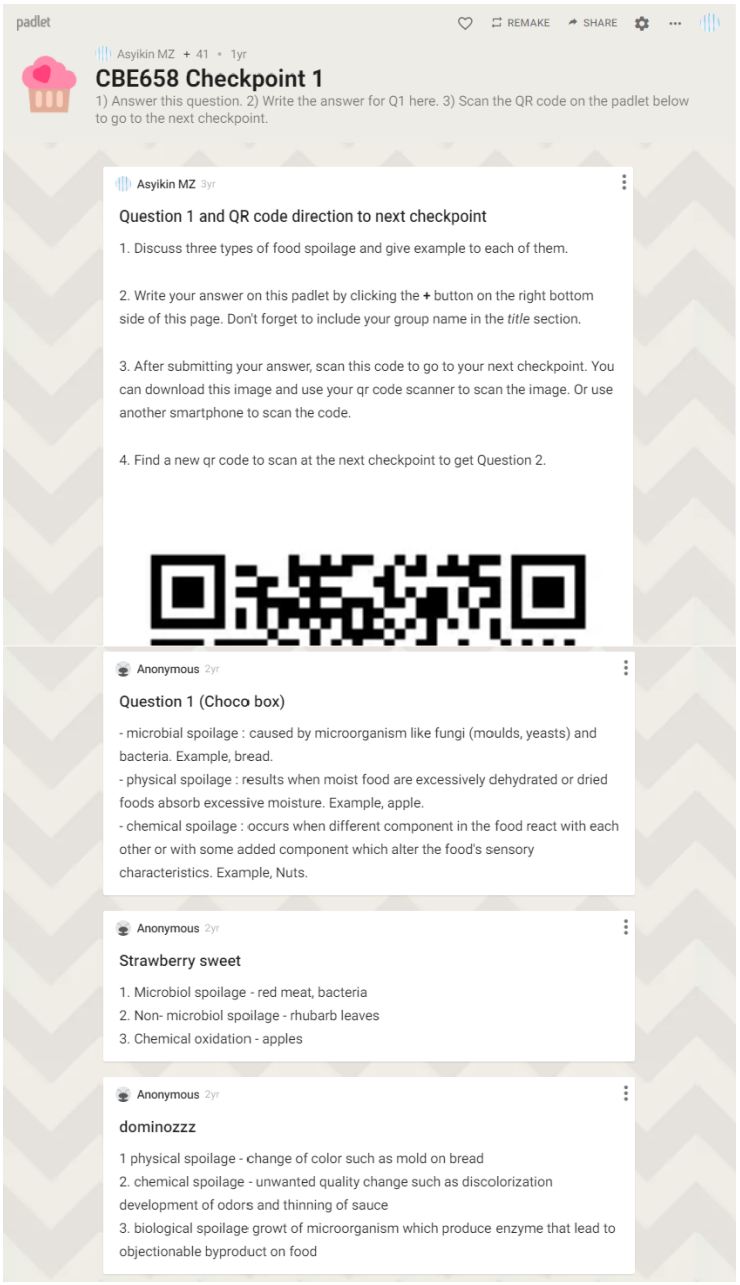


**Fig. 2** Tools used in the gamification setting: Padlet for Treasure Hunt

At the end of the course, feedbacks from the students were important to enhance the way of teaching and learning in the future. Google Forms was used to collect feedbacks on the students' preference, interest and motivation in learning.

## Results and Discussion

A total of 276 students took part in the questionnaire feedback survey. Fig. 3 shows the type of teaching methods and learning activities mostly preferred by students. It was observed that game-based and gamification approach gained the highest preference at 70.3%. The second highest preference was activity using technology which was not surprising as this mobile-savvy generation engaged with their gadgets most of the time. Clearly, only around 25% were motivated by traditional lecture approach in classroom setting.

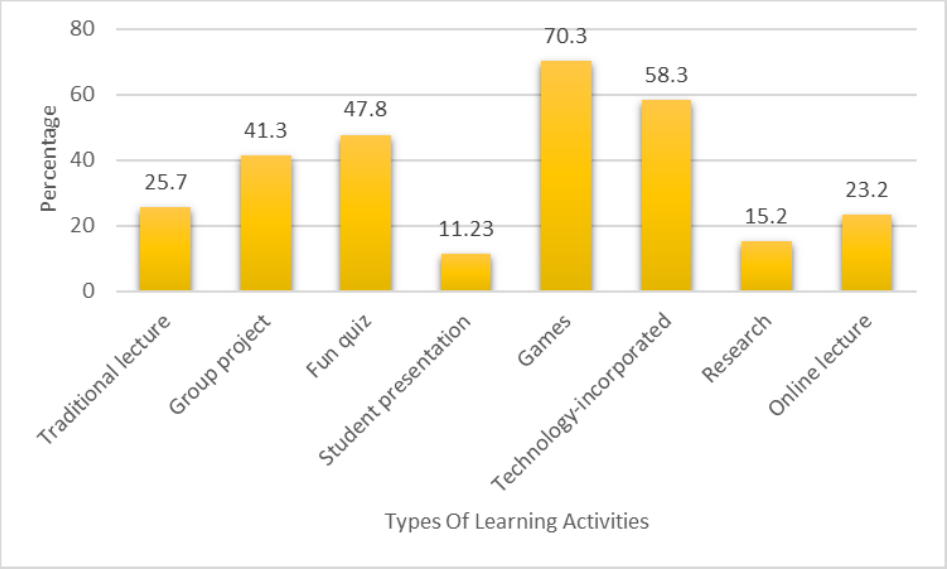


**Fig. 3** Students' Preferences on Learning Activities

## Conclusion

Game-based and gamification in classroom offer flexibility of learning and make the course more interesting for both students and instructors. Students may need to adapt their learning approach to benefit from the game-based and gamification model. They learn immersively and gain knowledge deeper through gamification. It seems that gamification has more implied expectations compared to conventional teaching approaches, and students need to be prepared for knowledge acquisition, either in the classroom or online platform. It is important that educators are able stimulate students' self-motivation and engagement during the practical of game-based and gamification approach in classroom or online platform. The effects of game-based and gamification should be considered during design phase because some game elements such as points and ranks are rarely used independently (An, 2020). It can be concluded that game-based and gamification-incorporated learning do benefit motivation and performance if designed properly.

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## References

An, Y. (2020). Designing effective gamified learning experiences. International Journal of Technology in Education (IJTE), 3(2), 62-69.

Annetta, L.A., Minogue, J., Holmes, S.Y., Cheng, M.T. (2009). Investigating the impact of video games on high school students' engagement and learning about genetics. *Computers & Education,* 53(1), 74-85. doi: 10.1016/j.compedu.2008.12.020

Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Improving participation and learning with gamification. Proceedings of the First International Conference on gameful design, research, and applications, 10-17. doi:10.1145/2583008.2583010

Bouwmeester, R.A.M., de Kleijn, R.A.M., van den Berg, I.E.T., ten Cate, O.T.J., van Rijen, H.V.M., Westerveld, H.E. (2019). Flipping the medical classroom: Effect on workload, interactivity, motivation and retention of knowledge. *Computers & Education*, 139, 118-128. doi: 10.1016/j.compedu.2019.05.002

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification". Proceedings of the 15th International Academic MindTrek Conference, 9-15. doi:10.1145/2181037.2181040

De Freitas, S., & Conole Gráinne. (2010). The influence of pervasive and integrative tools on learners' experiences and expectations of study. In R. Sharpe, H. Beetham, & S. De Freitas (Eds.), Rethinking learning for a digital age: How learners are shaping their own experiences. New York: Routledge.

Hanus, M. & 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(0), 152-161.

Liu, Y. (2014). Teacher Designed Games: Leading Innovation in Classrooms. In M. Searson & M. Ochoa (Eds.), Proceedings of SITE 2014 - Society for Information Technology & Teacher Education International Conference (pp. 665-669). Jacksonville, Florida, United States: Association for the Advancement of Computing in Education (AACE).

Mekler, E., Brühlmann, F., Opwis, K., & Tuch, A. (2013). Do points, levels and leaderboards harm intrinsic motivation? An empirical analysis of common gamification elements. Proceedings of the First International Conference on gameful design, research, and applications, 66-73. doi:10.1145/2583008.2583017

Papastergiou, M. (2009). Digital game-based learning in high school computer science education: Impact on educational effectiveness and student motivation. *Computers & Education*, 52(1), 1-12.