European Proceedings of
Social and Behavioural Sciences
EpSBS

www.europeanproceedings.com

e-ISSN: 2357-1330

DOI: 10.15405/epsbs.2020.12.05.20

IEBMC 2019

9th International Economics and Business Management Conference

ARE YOU READY, STUDENT? ASSESSING UNDERGRADUATE READINESS ON GAMIFIED CLASSROOM

Zaifudin Bin Zainol (a)*
*Corresponding author

(a) Universiti Tenaga Nasional, Sultan Haji Ahmad Shah Campus, Muadzam Shah, Pahang, Malaysia, Zaifudin@uniten.edu.my

Abstract

The demand for games is increasing among the young generation due to the usage and popularity on smart phones and technologies. They feel that gaming can lead to more engaging experience. Gamified classroom is using game mechanics by the undergraduates in completing task given by the educators. It can be done individually or by teamwork. Variety of the game mechanics that can be used in gamified classroom is level, challenges, trophies and competition. Gamified classroom can be implemented as a one of the medium by the educators to achieve high quality education. It is aligned with the engagement learning theory that suggest student become more engaged when they are performing worthwhile task and interact with each other. The objective of this study is to determine the undergraduate readiness on gamified classroom by determining it through sample of 50 student from Universiti Tenaga Nasional. Accounting and finance were chosen as an empirical study because these two programme contains both calculation and theory subjects. This study found that majority of the undergraduate think that gamified classroom can increase their engagement and they are ready to experience gamified classroom in their education programme. This study may be useful to the educator and higher learning institution in determining the student readiness on gamified classroom.

Keywords: Gamification, higher learning education, gamified classroom, engagement learning theory.

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

1. Introduction

Gamification is an active learning experience that utilizing existing technologies in designing a game and its mechanics to increase student participation and engagement in class. The objective of gamification establishment is to motivate students to complete a task given by the lecturer. Prior study have tested this active learning and found positive correlation with the student performance. Gamification encourage students to work as a team by setting up a rewards system where students need to achieve something through a teamwork. The demand for games is increasing among the young generation due to the usage and popularity on smart phones and technologies. They feel that gaming can lead to more engaging experience. Gamified classroom is using game mechanics by the undergraduates in completing task given by the educators. It is done individually or by teamwork. Variety of the game mechanics that used in gamified classroom is level, challenges, trophies and competition. Gamified classroom can be implemented as a one of the medium by the educators to achieve high quality education. It is aligned with the engagement learning theory that suggest student become more engaged and motivated when they are performing worthwhile task and interact with each other (Deterding et al., 2011; Glover, 2013; Kapp, 2012; Prensky, 2001; Werbach & Hunter, 2012).

1.1. Gamification components

There are three basic components of gamification, which is action, challenge and reward. First is challenge that the student will received a quest, mission and need to complete it individually or by a team. The points given once the student have completed the challenge and commonly it contain a deadline. Second component of gamification is action. Action are refer to performing certain activity by the student to achieve the learning outcome. For example, student need to act as an auditor and performing auditing procedures. Third component is reward. Reward is given when the student are able to complete the task given by the lecturer. For example, student that got highest score on Kahoot! Quiz will receive a box of chocolate.

1.2. Gamification mechanisms

With recent technology, many current gamification focus on using online platform that able use variety of mechanisms (Allen & Seaman, 2013; Tan & Hew, 2016). The main purpose of gamification is to motivate users to perform certain activities that increase the student engagement in class. Examples of game mechanics are points, trophies or badges, virtual goods, levels, and leader boards. These are summarized as follows (Bovermann et al., 2018; Bunchball, 2010; Educause, 2011; Tan & Hew, 2016):

- Point or score: collection of tokens or merit by the students in completing task given by the lecturer and will be rewarded based on highest point collected. For example, Kahoot!
- Badges or trophies: reward to the student when they completed specific task by the lecturer in a form of logo or icon. For example, student received “gold trophies of fastest student” when they come early to the class. It is different with point where all of the student can earn it, not based on highest score.
- Levels: mastery status of the student when they completed harder task or assignment. For example, novice, amateur, semi pro and professional

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

• Leader boards: refer to high-score tables that indicate an individual's performance compared with other users. It is mostly used for long-term period for example for beginning until the end of semester.

Study done by Bunchball (2010) based on Table 01 found that game mechanics are highly related to the human desires which reward, status, achievement, self-expression and competition.

Table 01. Relationship between game mechanics and human desires (Bunchball, 2010)

Game Mechanics	Reward	Status	Achievement	Self expression	Competition
Points	✓				
Levels		✓			
Virtual goods				✓	
Leader boards					✓
Badges			✓		

1.3. Prior study on gamification effectiveness

Study done by Tan and Hew (2016) in USA with the sample of 22 students found that the use of game meachanics such as points, trophies and leader boards has increased the student engagement to subject taught in higher learning institution. Game mechanics has a positive impact on motivating students to engage with more difficult tasks in the course. It suggests that gamification help student completing harder task and assignment given by the lecturer.

The experiment that has been conducted by Hamari et al. (2014) on 40 undergraduate mechanical engineering students found that gamification had a positive effect in perceived learning both directly and directly through increased in the engagement. Empirical study by Fotaris et al. (2016) on 52 students using Kahoot! as a learning platform found that gamification are able to increase student attendance, assignment completion and overall academic performance of the students. It is also observed that the student that exposed with gamified classroom tend to have more effort in downloading learning materials than non-gamified group.

1.4. Significant of the study

This study may be useful to the educator and higher learning institution in determining the student readiness on gamified classroom. This study also will be able to determine the student need in their education and revolutionise the educator's method in teaching.

2. Problem Statement

Study done by Boyle et al. in 2016 shows that study in gamification has increased over the years with a total of 143 studies. It comprises of 43% studies were conducted on North America, 31.5% studies from Europe, 18% from Asia and 7.5% from South America, Australasia and Africa. It shows that there was lack of studies conducted on gamified classroom in Asia, especially in Malaysia. Study done by Tan and Hew (2016) also reported the same result, which is most of the studies, are coming from United States and Europe. This study is important in Malaysia to determine the best method that can increase motivation and engagement among students and gamified classroom might fit those needs.

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

3. Research Questions

The research question for this study were as follows:

1. What are the extent of the undergraduate readiness on gamified classroom?
2. Is there any significant differences between undergraduate readiness on gamified classroom with their academic performance?

4. Purpose of the Study

The objective of this study is to determine the undergraduate readiness on gamified classroom by determining it through sample of 50 student from Universiti Tenaga Nasional. Accounting and finance were chosen as an empirical study because these two programmes contain both calculation and theory subjects. The second purpose is to determine the significant differences between student academic performances with the readiness on gamified classroom.

5. Research Methods

In this section, this study will describe the types of research and collection procedure and also population and sample for this study

5.1. Type of research and data collection procedure

The purpose of this research is to determine the student readiness on gamified classroom in higher learning institution. The type of this study is descriptive analysis. The data source for this study is primary data. Questionnaire were chosen as the data collection method because this study involves a large number of students from higher learning institution. It is quite difficult to use method such as interview when a large number of students are involved. This questionnaire was distributed through electronic questionnaire, which is google form.

5.2. Population and sample

In this research, the target population is the undergraduate students higher learning institution Universiti Tenaga Nasional (UNITEN). The sample divided into the programme namely Bachelor of Accounting and Bachelor of Finance. The final sample for this study is 50 students. Sampling techniques that used in this study is simple random sampling technique. Descriptive study used in examining the readiness of the student towards gamified classroom. The population chosen is from corporate governance and auditing subject from Semester 2 2018/2019 and Semester 1 2019/2020 with the number of 98 students. Thus, a valid sample size of 98 students, with the response rate of 51.02% deemed suitable for this study (Sekaran & Bougie, 2016).

6. Findings

This study will begin with demographic analysis and further explain the findings on undergraduate readiness on gamified classroom.

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

6.1. Demographic analysis

Table 02. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	7	14.0	14.0	14.0
	Female	43	86.0	86.0	100.0
	Total	50	100.0	100.0	

Table 03. Cumulative grade point average (CGPA)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00-2.49	2	4.0	4.0	4.0
	2.50-2.99	2	4.0	4.0	8.0
	3.00-3.49	11	22.0	22.0	30.0
	3.5-4.00	35	70.0	70.0	100.0
	Total	50	100.0	100.0	

Table 04. Programme

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor of Finance	15	30.0	30.0	30.0
	Bachelor of Accounting	35	70.0	70.0	100.0
	Total	50	100.0	100.0	

Table 02, Table 03, and Table 04 show the demographic profile of the sample. The sample were breakdown into 86% female, consisting of 43 students and 14% male, consisting of 7 students. The entire sample taken from bachelor's degree student divided into 70% from Bachelor of Accounting (Hons.) student (35 students) and 30% from Bachelor of Finance (Hons.) students (15 students). in terms of cumulative grade point average (CGPA), majority of the sample are from student who score 3.50-4.00 (70%), while remaining is 22% in the group of 3.00-3.49 and 8% of student that get 2.99 and below.

Table 05. Undergraduate experience with games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Both computer and mobile phone	22	44.0	44.0	44.0
	Play games on computer	1	2.0	2.0	46.0
	Play games on mobile phone	27	54.0	54.0	100.0
	Total	50	100.0	100.0	

Table 06. Frequency of playing games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	>25 hours per week	3	6.0	6.0	6.0
	15-25 hours per week	2	4.0	4.0	10.0
	6-15 hours per week	6	12.0	12.0	22.0
	2-5 hours per week	22	44.0	44.0	66.0
	less than 1 hour per week	17	34.0	34.0	100.0
	Total	50	100.0	100.0	

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

The other demographic question shown it the Table 05 and Table 06, the preferable platform that used by student in playing games. This study found that majority of the students playing games on mobile devices such as smartphone and tablet (54%). Only 2% of the students play their games on computer. The remaining of 44% of students play games on both platforms. The students tend to use with only these two platforms because they are staying at the hostel and only these two platforms were available to them. Next question is on the frequency of playing games. 44% of students found to be playing occasionally 2-5 hours per week, 34% of student playing games for only less than 1 hour per week, 12% of student playing games for 6-15 hours per week, 4% of student played 15-25 hours per week and 6% of student playing games more than 25 hours per week which is the longest estimated time of games played by the students.

6.2. Gamified classroom descriptive analysis

Table 07. Preference of subject area for gamified classroom

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Both	26	52.0	52.0	52.0
	Calculation Subject	6	12.0	12.0	64.0
	Theory Subject	18	36.0	36.0	100.0
	Total	50	100.0	100.0	

Based on Table 07, it shows that student are mostly preferred the gamified classroom to be used in both calculation subject (e.g. auditing; corporate governance) and calculation subject (e.g coporate finance; financial reporting), meanwhile 36% of the student preferred gamified classroom to be used only on theory subject and 12% for only calculation subject.

Table 08. Descriptive analysis on gamified classroom

	N	Min	Max	Mean	Std. Deviation
Gamification can help create more engaging experiences for students	50	3	5	4.16	0.681
Gamification can make learning more rewarding	50	3	5	4.30	0.614
Gamification can result in higher completion rates for tutorial and assignment	50	2	5	4.14	0.808
Gamification can improve student performance	50	2	5	4.14	0.729
Gamification can increase student participation in class	50	3	5	4.52	0.614
Gamification can improve learning process	50	3	5	4.24	0.625
I find gamified classroom is more effective than traditional in-class delivery.	50	2	5	4.24	0.797
An advantage of gamified classroom includes greater flexibility in arranging student class activities.	50	3	5	4.28	0.640
UNITEN have good facilities to provide gamified classroom	50	1	5	3.40	1.107
I am ready to learn using gamification	50	2	5	4.20	0.700

Based on Table 08, most of the students agreed that gamification could help create more engaging experience in class (4.16). They felt that if the gamified classroom used, it could increase their class

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

engagement. This is because they are doing class activities that are more interactive than traditional classroom such as Kahoot! These results are supported with the study done by Tan and Hew (2016), Hamari et al. (2014), and Hamari (2015) that participation in gamified classroom can increase student engagement. Majority of the undergraduate in UNITEN also agreed (4.30) that gamification can make learning more rewarding and gamification can result in higher completion rates for tutorial and assignment (4.14 over 5). Majority also agreed that that gamification can improve student performance (4.14) and gamification classroom have greater flexibility in arranging student class activities (4.28). However, the mean score for facilities provided is only 3.40 indicating that some of the student disagree that UNITEN had good facilities to provide gamified classroom. The mean score for readiness is 4.20 indicating most of the students are ready to learn using gamified classroom.

6.3. Realibility test

Table 09. Realibility test

	Cronbach's Alpha
Engagement	.810
Reward	.817
Completion	.832
Improve	.807
Participation	.815
Learning	.799
Effectiveness	.791
Flexibility	.803
Facility	.880
Readiness	.806

Table 09 shows the reliability test result, and it is found that cronbach's alpha for all elements are above 0.79 showing that the entire question are valid and appropriate to used in this study. The questions in this questionnaire all reliably measure the same latent variable.

6.4. Kruskall Wallis H test

Table 10. Kruskall Wall H Ranks

	Undergraduate Readiness	N	Mean Rank
CGPA	Disagree	1	33.00
	Neutral	5	33.00
	Agree	27	24.17
	Strongly agree	17	24.97
	Total	50	

Table 11. Kruskal Wallis H test statistics

	CGPA
Chi-Square	2.841
df	3
Asymp. Sig.	.417
a. Kruskal Wallis Test	
b. Grouping Variable: Undergraduate readiness	

https://doi.org/10.15405/epsbs.2020.12.05.20
Corresponding Author: Zaifudin Bin Zainol
Selection and peer-review under responsibility of the Organizing Committee of the conference
eISSN: 2357-1330

A Kruskal-Wallis H test in Table 10 and Table 11 showed that there was a no statistically significant difference in student CGPA score between the different readiness, $\chi 2(2) = 2.841$, $p = 0.417$, with a mean CGPA score of 33 for disagree, 33 for neutral, 24.17 for agree and 24.97 for strongly agree. The result is inconsistent with the study done by Fotaris et al. (2016) and Hamari et al. (2016) that show significant difference between student performances, engagement with readiness on gamified classroom.

7. Conclusion

Gamification is a part of flipped classroom method used nowadays by the educators. With the advance technology, undergraduate get more exposure in games. This study did not found significant differences between academic undergraduate performances with their readiness on using gamified classroom. However, this study found that most of the students agreed that gamification could help create more engaging experience in class. They also agreed that gamification can make learning more rewarding and gamification can result in higher completion rates for tutorial and assignment. Undergraduate also think that gamification can improve student performance and gamification classroom have greater flexibility in arranging student class activities. This can be used as indicator to the higher learning institution that undergraduate is ready to learn through gamified classroom.

7.1. Limitation of the study

This study having limited number of samples which only consisting of 50 undergraduates from accounting and finance programme, ignoring the other programme such as marketing, human resources and international business. This study also only focus in one institution and these factors might lead to bias in the findings.

7.2. Recommendation for future research

Future research can be focusing on increasing the number of sample size and having a diverse programme as a sample. The comparison between the countries also can used as future research to get more result that is accurate on undergraduate readiness over gamified classroom.

References

Allen, I. E., & Seaman, J. (2013). *Changing course: Ten years of tracking online education in the United States.* Babson College/Quahog Research Group.

Bovermann, K., Weidlich, J., & Bastiaens, T. (2018). Online learning readiness and attitudes towards gaming in gamified online learning – a mixed methods case study. *International Journal of Educational Technology in Higher Education, 15*(1), 27. https://doi.org/10.1186/s41239-018-0107-0

Boyle, E. A., Hainey, T., Connolly, T. M., Gray, G., Earp, J., Ott, M., Lim, T., Ninaus, M., Ribeiro, C., & Pereira, J. (2016). An update to the systematic literature review of empirical evidence of the impacts and outcomes of computer games and serious games. *Computers & Education, 94*, 178-192.

Bunchball. (2010). Gamification 101: An introduction to the use of game dynamics to influence behaviour. http://www.bunchball.com/gamification101

Deterding, S., Khaled, R., Nacke, L., & Dixon, D. (2011, May). Gamification: Toward a Definition, CHI 2011 Gamification Workshop Proceedings. In 2011 Annual Conference on Human Factors in Computing Systems (CHI'11). Vancouver.

Educause. (2011). *7 things you should know about gamification.* https://net.educause.edu/ir/library/pdf/ELI7075.pdf

Fotaris, P., Mastoras, T., Leinfellner, R., & Rosunally, Y. (2016). Climbing up the Leaderboard: An Empirical Study of Applying Gamification Techniques to a Computer Programming Class. *Electronic Journal of e-learning, 14*(2), 94-110. https://eric.ed.gov/?id=EJ1101229

Glover, I. (2013). Play as you learn: gamification as a technique for motivating learners. Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications (pp. 1999–2008).

Hamari, J. (2017). Do badges increase user activity? A field experiment on the effects of gamification. *Computers in human behavior, 71*, 469-478. https://doi.org/10.1016/j.chb.2015.03.036

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies of gamification. In R. H. Sprague (Ed.), *Proceedings of the 47th Hawaii International Conference on System Sciences* (pp. 3025–3034). IEEE Press.

Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education.* Pfeiffer.

Prensky, M. (2001). *Digital Game-Based Learning.* McGraw-Hill.

Sekaran, U., & Bougie, R. (2016). *Research methods for business: a skill-building approach* (7th ed.). John Wiley & Sons.

Tan, M., & Hew, K. F. (2016). Incorporating meaningful gamification in a blended learning research methods class: Examining student learning, engagement, and affective outcomes. *Australasian Journal of Educational Technology, 32*(5). https://doi.org/10.14742/ajet.2232

Werbach, K., & Hunter, D. (2012). *For the win: How game thinking can revolutionize your business.* Wharton Digital Press.