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EXPLORING TERTIARY LEARNERS' PERCEPTION TOWARDS THE USE OF GAMIFICATION IN LEARNING

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Abstract: *To understand the major stakeholders identified as tertiary students on the use of gamification in learning while pursuing their higher education study. A quantitative, descriptive research design of 152 undergraduate students from a private university in Malaysia, taking degree programmes from different various disciplines was conducted to obtain details about their experiences in gamification as a learning tool either inside or outside classroom. In addition, an analysis of their responses on their expectation of gamification in education, attitudes toward gamification and knowledge towards gamification too. Undergraduate students have a positive attitude towards gamification and they believe that its use of learning in classroom is able to generate their interest in learning. The significant of this study is gamification using the game elements have an incredible power in creating long-term engagement of the user experience and such experience and engagement can be translated into anything meaningful learning in higher education, gamification may not only simply play as a form of entertainment, but it can allow user to possess the ability to engage in higher learning.*

***Keywords**: Gamification, Tertiary Learner, Education, Game, Active Classroom Learning*

Introduction

The purpose of this study is to understand the major stakeholders identified as tertiary students on the use of gamification in learning while pursuing their higher education study. Review in this area explained gamification is a relatively new approach used in education and it is an emerging concept being increasingly applied in learning (Landers & Callan, 2011; Lee & Hammer, 2011; Muntean, 2011). Therefore, we conduct this study focusing at students' perception on their common gaming experiences, gaming expectation, knowledge of gamification and attitudes toward gamification. Hopefully, this understanding of students' perception on the use of gamification will support the development of a gamified system for learning in higher education.

It is undeniable that there is a shift in the way students are receiving and processing information in today's digital world. The issue arises was due to Malaysian tertiary students grew up in digital technologies era and have always had access to computer and played games on those computers throughout their lives. Hence, there is a strong tendency for them to expose themselves to games in their learning. As such, educators might consider to value-add their teaching methods and approaches to ensure that students are active and engaged in the classroom using gamification pedagogy. One such modern pedagogical trend in education is using information communication technology (ICT) to implement such active learning in the classroom is called gamification. Thus, gamification has an innate ability to bring out fun with its significant element in students learning activity. Gamification is versatile too. By using it, most learning needs can be fulfilled resulting in academic performance gain for students.

Research Objectives and Question

The present study aimed to determine how gamification in education is perceived by tertiary students whether the student's views are unified around their current knowledge and attitudes towards gamification. Within this scope, questions to the following research are sought:

1. Are tertiary students familiar with the term gamification?
2. Is there an association between students who played games and the use of gamification pedagogy in the classroom?
3. What are tertiary students' common perception on gamification experiences, gamification expectations, attitudes toward gamification and knowledge about gamification?

Literature Review

Definition of Gamification

Gamification is receiving growing number of interests in education (Deterding, Sicart, Nacke, O' Hara & Dixon, 2011). The term "gamification" was first introduced in 2008, in the digital media industry. However, it is in 2010 that the term was adopted in other areas on a more common basis (Deterding, et al, 2011). Presently, the term is widespread in different field of business, marketing, corporate management, healthcare, scientific research and education (Dicheva, Divhe, Agre & Angelova, 2015). Because of its widespread adoption in many fields, its representation is rather diverse.

The most common use of the term generally acknowledges "the application of game-like elements, such as badges, leader boards and other rewards to nongame situation to create a competitive environment and incentivize desired behaviour" (Isaacs, 2016). However, Kapp in 2012 offers another definition as "using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems." With a widespread of definitions overlapping, Deterding and colleagues summarized the definition of gamification as, "the use of game design elements in non-game context" (Deterding et al., 2011).

Gamification and Games

Games are an integral part of the creation of the gamification concept. The term "game" is defined as "a system in which players engage in an artificial conflict defined by rules that results in a quantifiable outcome" (Tekinbas & Zimmerman, 2004). However, the distinction should be made between games and gamification. Marczewski (2015) suggest that the purpose of games is to entertain. Chou (2015) comments that games have an incredible power in creating long-term engagement of the user experience and if such experience and engagement

do not translate into anything meaningful, games may only simply play as a form of entertainment and do not possess the ability to engage in higher learning.

Chou (2015) concludes that gamification is to borrow individual game elements from games to change things in real life. The approach of gamification is to introduce only a few game mechanics into a standard learning experience to ensure that the learning experience of students become more beneficial. However, Deterding and colleagues (2011) and Marczewski (2015) would differentiate gamification from a game in that gamification is not a full-fledge game.

Gamification in Education

According to Dicheva and Dichev (2015), gamification in education can be defined as "introduction of game elements and gameful experiences in the design of learning processes." The advantage of implementing gamification to the student learning experience is based on the belief that it can foster motivation in the student experience, change students behaviour in desirable ways, promote cooperation and healthy competition between students (Dicheva & Dichev, 2015). Buckley and Doyle (2016) also suggest that gamification in education can increase student engagement and exchange learning. Also, in the case of learning, students are the "players" in the gamification system and hence, enable them to successfully gamify learning for improved motivation and engagement (Aparicio, Vela, Sancdez & Montes, 2012; Werbach & Hunter, 2012)

Benefits of Gamification in Education

Some benefits of using gamification in the instructional process as reported in Gamification In eLearning (2017) are: First, instant feedback. Since gamification provides metrics, it can be easily seen by trainer how a participant is progressing. From the students' perspective, tests and assignments as well as all other activities provide different levels of feedback, so that learners know what they know or what they should know. This follow by better learning environment, for instance the learning experience is personalized; the learners could evolve in their own rhythm, in a safe way. Gratification system provides an effective, informal learning environment that helps learners practice real life situations and challenges. Gamification is about a lot more than just surface level benefits granted by points, badges, reputation level as it can catalyse behavioural change, especially if combined with the scientific principles of cyclical learning and ensuring retention.

On the other hand, some drawbacks of using gamification in an excessively or wrong way must be considered. By making play mandatory, gamification might create rule-based experiences that feel just like school. The effort, not mastery should be rewarded, and the students should learn to see failure as an opportunity, instead of becoming unmotivated or fearful. Activities need to be designed so that students can repeat them in case of an unsuccessful attempt (Kiryakova, Angelova & Yordanova, 2014). Feedback can be used as a correction of students' actions and should be a stimulus to their further activities. Also, the trainers should balance metrics with real engagement.

The design of the challenges and the setting of the content have to be carefully considered in order to make it as neutral as possible while not seeming trivial and boring. According to Kathy Sierra, a popular technology blogger, author and game developer, rewards "should be left at the classroom door" (Gamification in the Classroom, 2014) "a well- designed game only deploys certain mechanics to support an intrinsically rewarding experience". If the experience is removed but the mechanics kept, the users psychology changes so that, in essence, it "uses mechanics to drive mechanical behaviors" with little or no gain for the educational process.

Nevertheless, motivators like points, badges, and leaderboards are not effective for students who aren't naturally competitive, and if these elements will have a central role, the students will finally lose their interest.

Methodology

The research design, population, survey instrument and procedures for conducting the study are discussed in the following sections.

Research Design

A quantitative, descriptive research design was conducted to obtain details about undergraduate students' game experiences in gamification as a learning tool either inside or outside classroom. In addition, we analyse their responses on their expectation of gamification in education, attitudes toward gamification and knowledge towards gamification too.

In this survey, a total of 152 data was collected from undergraduate students from a private university in Malaysia. Sample selected from undergraduate was because they formed the largest game-player demography in tertiary education (Brand, Borchard & Holmes, 2009). Survey questionnaire was employed for this study. Questionnaires were randomly distributed to tertiary students taking degree programmes from different various disciplines.

They survey instrument adapted by Fisher, Beedle and Rouse (2014) and Cheong, Filippou and Cheong (2013) that consisted of questions required participants to provide demographic information and game playing experience in a simple multiple-choice question. This followed by questions required participants to provide answer on their experiences with gamification in classroom, their gamification expectation, knowledge of gamification and attitudes towards gamification in education based on 5-point Likert scale of strongly agree to strongly disagree.

Findings

The questionnaire responses were analysed along the dimensions of gaming experience, gamification expectation, knowledge of gamification and attitudes towards gamification.

Demographics

Table 1 shows the demographics profile of the population. The total number of respondents were 152 tertiary students comprising of 64 male students (42.11%) and 88 female students (57.89%). The majority of the respondents age group fell between 18 to 21 years of age (81.58%) and were full-time students (99.34%). The local student respondents comprise of 128 students as compared to the international student respondents of 24 students.

Table 1: Demographic Profile of Population

Variable	n	Percentage
Gender		
Male	64	42.11
Female	88	57.89
Age Group		
18 – 21 years old	124	81.58
22 – 28 years old	27	17.76
29 – 48 years old	1	0.66

Mode of Study Full-Time Part-Time	 151 1	 99.34 0.66
Local Student International Student	128 24	84.21 15.79

Gaming Experience

It is important to investigate the gaming experience of the students to ensure how well they are acquainted with games. The analysis of this dimension confirms typical beliefs about students being frequent gamers.

From the analysis of the responses, in Figure 1, it was found that 119 respondents (78.29%) have played computer games previously. Of the students surveyed, at least 25 respondents (16.45%) played computer games daily with 33 respondents (21.71%) playing at least once per week as shown in Figure 2. The most common typed of games played among the respondents are: shooter (17.10%), adventure (16.58%), strategy (15.28%), multi-player (14.77%) as stated in Figure 3. Other games include fantasy and sports related games. Students' most common reasons to play computer games included: to relieve boredom (38.04%), to play with others (27.06%) and as a source of mental challenge (17.25%). Others have noted that playing games help them to relieve stress as shown in Figure 4.

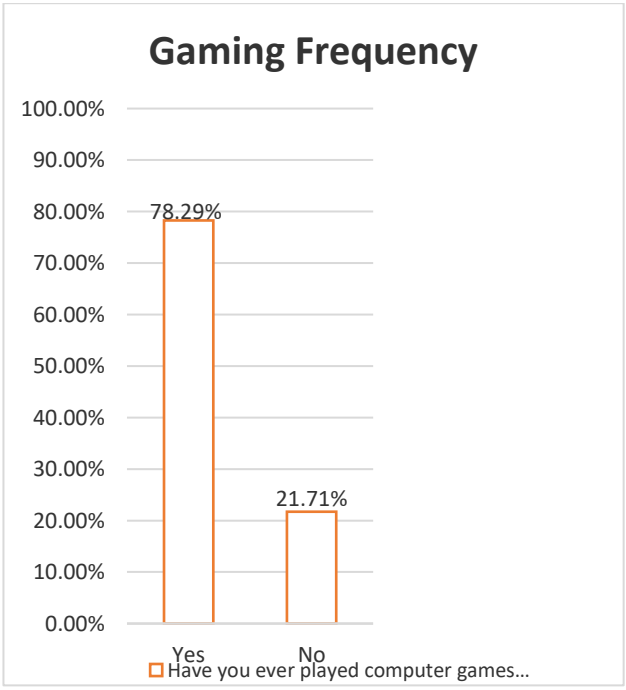

Figure 1: Gaming Frequency

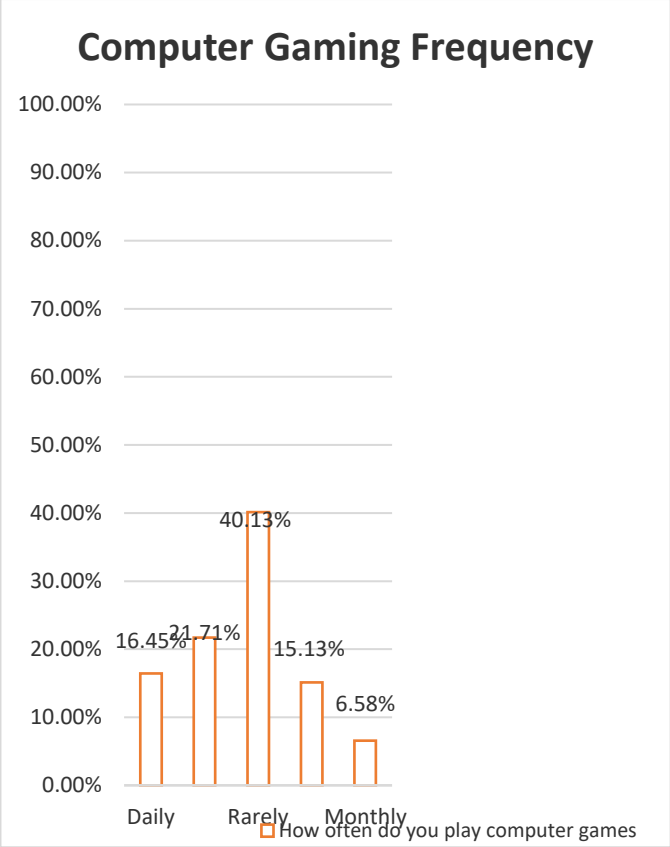

Figure 2: Computer Gaming Frequency

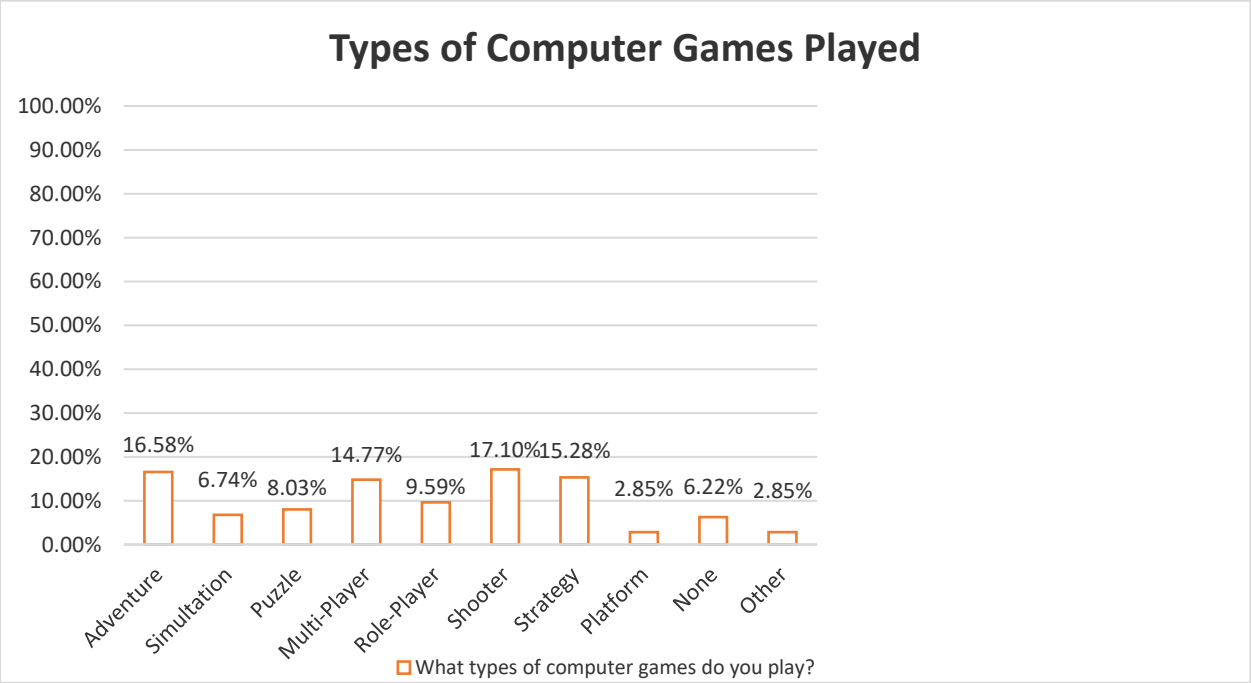

Figure 3: Types of Computer Games Played

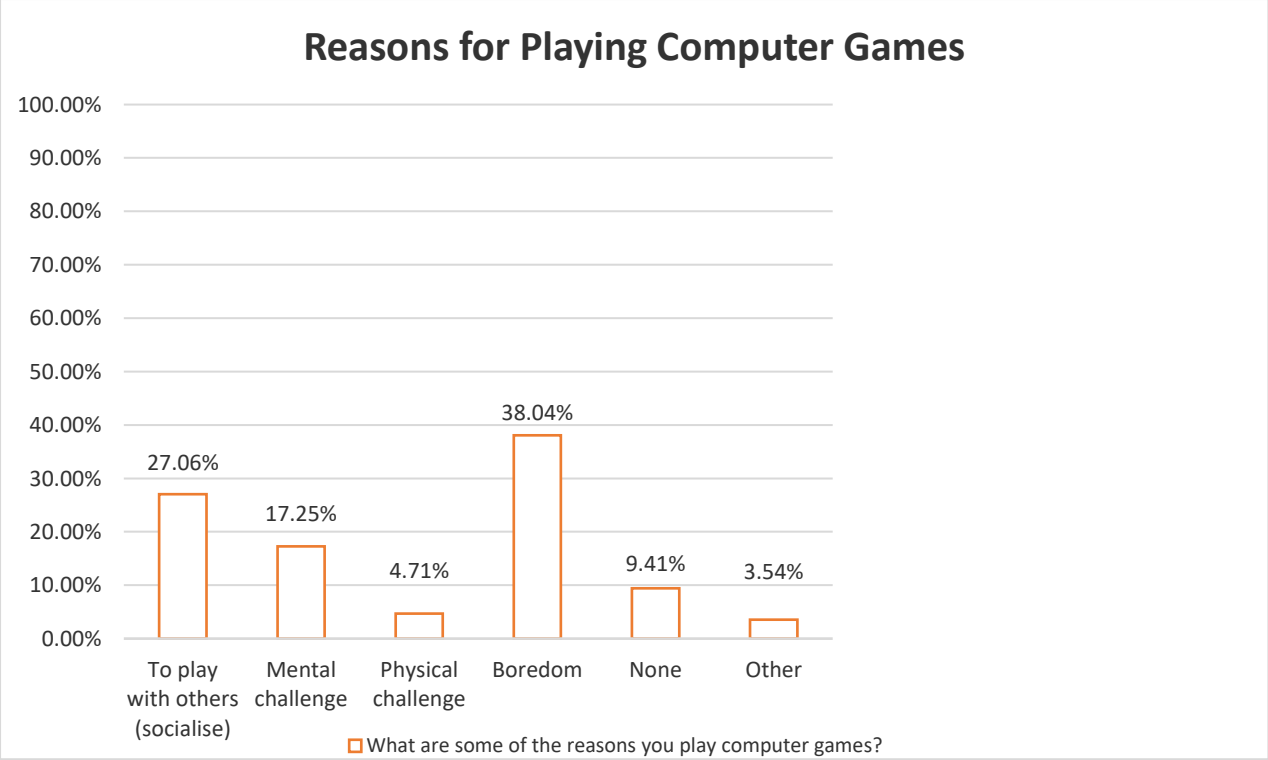

Figure 4: Reasons for Playing Computer Games

Experiences with Gamification in Classroom Settings

Ten questions were asked in terms of university students experience with gamification in the classroom. Over ninety-one percent of students strongly agreed or agreed to use various technologies on a daily basis such as cell phone, tablet or a computer.

Table 2: Experiences with Gamification

Survey Question	Rank	Frequency N = 152	Percentage	Mean
I use various technologies on a daily basis (e.g. cell phone, tablet, computer)	SA A UD D SD	92 47 7 3 3	60.53 30.92 4.61 1.97 1.97	4.46
I often play games outside the classroom via technology	SA A UD D SD	45 44 24 31 8	29.61 28.95 15.79 20.39 5.26	3.57
I often play board games outside the classroom without the use of technology	SA A UD D	11 28 35 59	7.24 18.42 23.03 38.82	2.69

	SD	19	12.50	
I often played video games as a child / adolescent	SA	33	21.71	
	A	65	42.76	
	UD	16	10.53	3.57
	D	31	20.39	
	SD	7	4.61	
I rarely played board games as a child / adolescent	SA	10	6.58	
	A	39	25.66	
	UD	18	11.84	2.68
	D	63	41.45	
	SD	22	14.47	
Playing games is a waste of time	SA	11	7.24	
	A	14	9.21	
	UD	37	24.34	2.36
	D	47	30.92	
	SD	43	28.29	
I regularly use games in the classroom	SA	9	5.92	
	A	30	19.74	
	UD	40	26.32	2.70
	D	52	34.21	
	SD	21	13.82	
I am interested in learning how to develop gaming techniques in my classroom	SA	20	13.16	
	A	64	42.11	
	UD	49	32.24	3.51
	D	12	7.89	
	SD	7	4.61	
Assignment in my classroom require students to use technology	SA	52	34.21	
	A	70	46.05	
	UD	22	14.47	4.09
	D	7	4.61	
	SD	1	0.66	
I teach student how to use games as an instructional tool	SA	11	7.24	
	A	29	19.08	
	UD	76	50.00	3.00
	D	21	13.82	
	SD	15	9.87	

Source: Fisher, D. J., Beedle, J., & Rouse, S. E. (2014). Gamification: A Study Of Business Teacher Educators' Knowledge Of, Attitudes Toward, And Experiences With The Gamification Of Activities In The Classroom.

Gamification Expectation and Attitude towards Gamification

The analysis of responses with regard to gamification expectation in learning revealed that, the majority of students (74.34%) are excited in learning using a computer game but, in term of the word "gamification", they had not heard of it before in their previous encountered as indicated in Figure 5. However, in term of attitude towards learning using computer games, as

shown in Figure 6, 45.39% of students expressed their neither interest, while 43.42% neither interested nor disinterest. Feelings towards gamification in education stated that 80 students (52.63%) felt comfortable and 35 students (23.03%) felt excited towards the idea of gamification in education which is encouraging. Only 11.18% of students said they would not be interested towards learning using computer games as indicated in Figure 7.

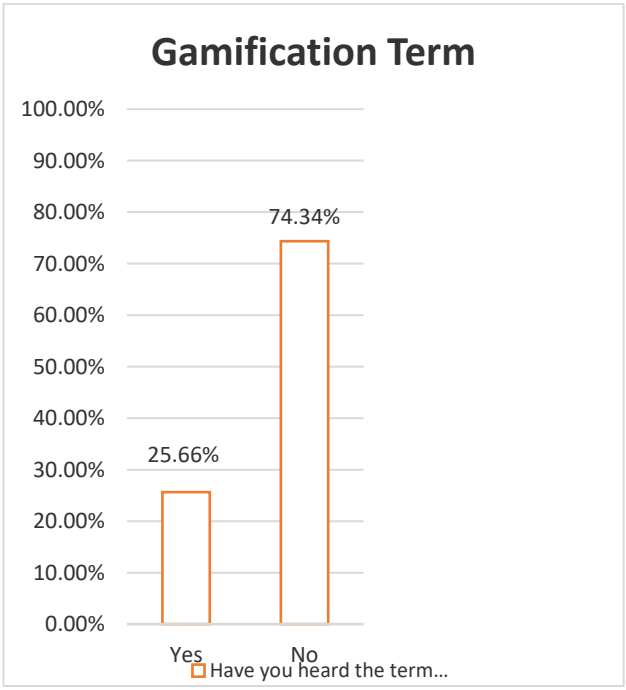

Figure 5: Gamification Term

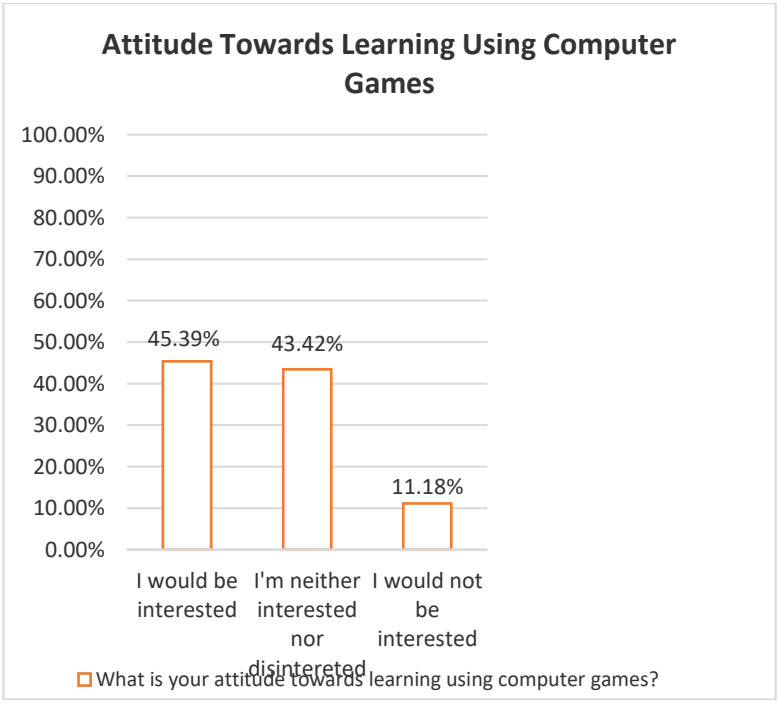

Figure 6: Attitude Towards Learning Using Computer Games

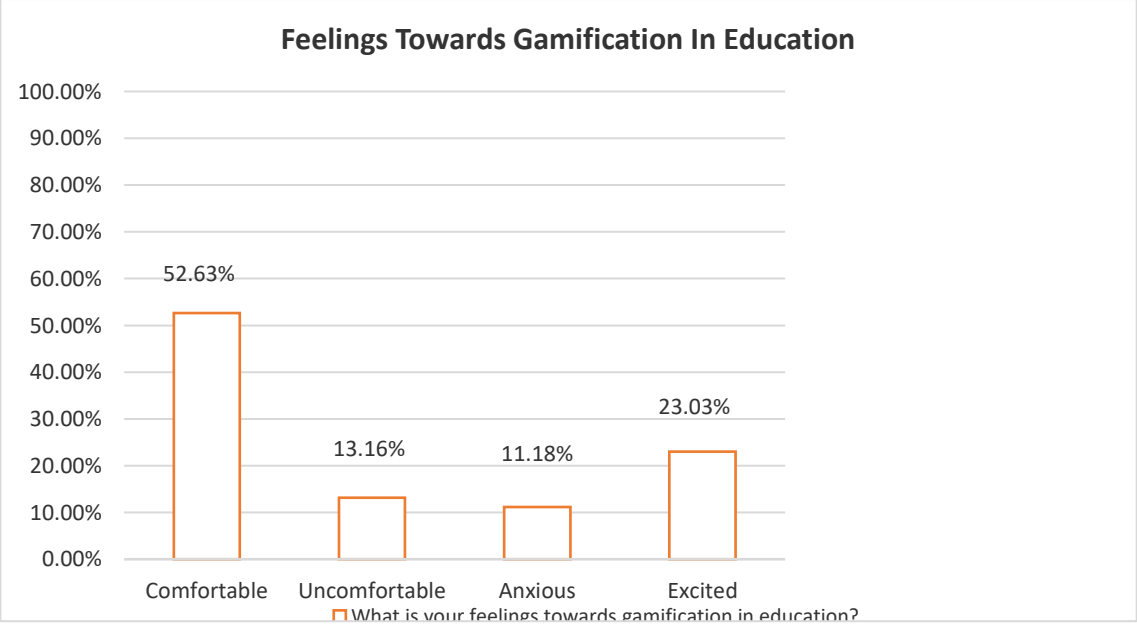

Figure 7: Feelings Towards Gamification In Education

In term of expectations towards gamification in education, majority of students (86.57%) have positive expectations of gamification in education. Many believe that its usage in the classroom would make the class more interesting (48.39%), improve the learning environment in the classroom (27.43%) and make class more challenging (10.22%) as expressed in Figure 7. As for benefits of gamification in education, the most commonly anticipated benefits of gamification in education by students were an improvement to their understanding of the class content (48.42%) and how gamification would highlight areas of their knowledge they would need to improve on (23.16%) as shown in Figure 9.

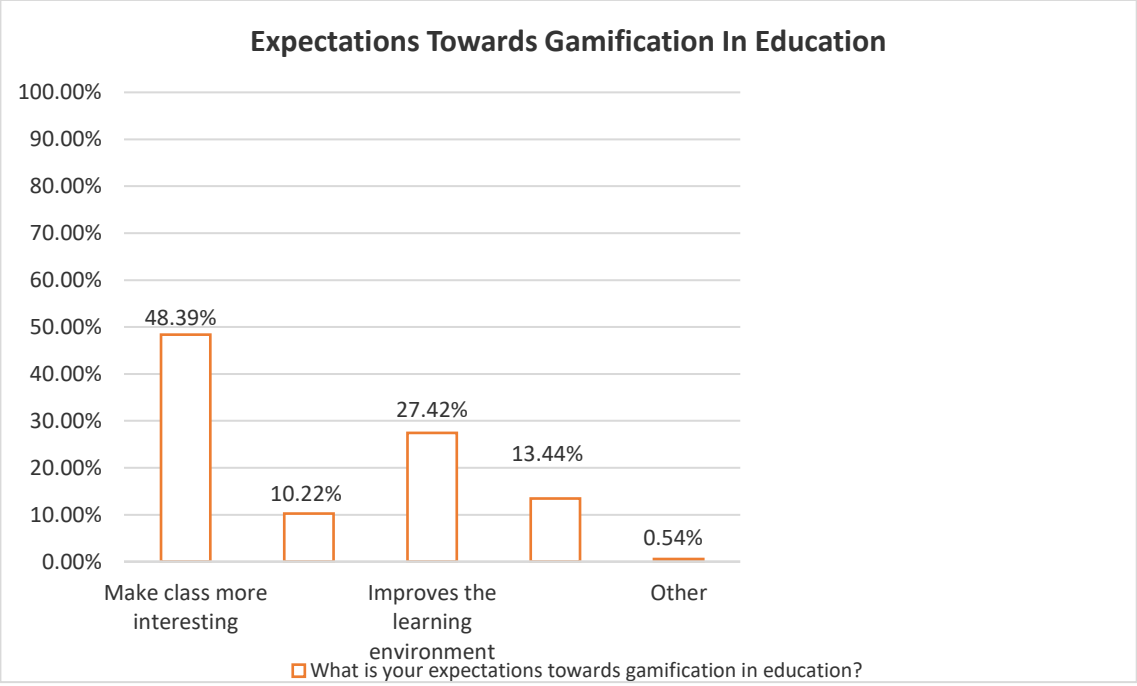

Figure 8: Expectations Towards Gamification In Education

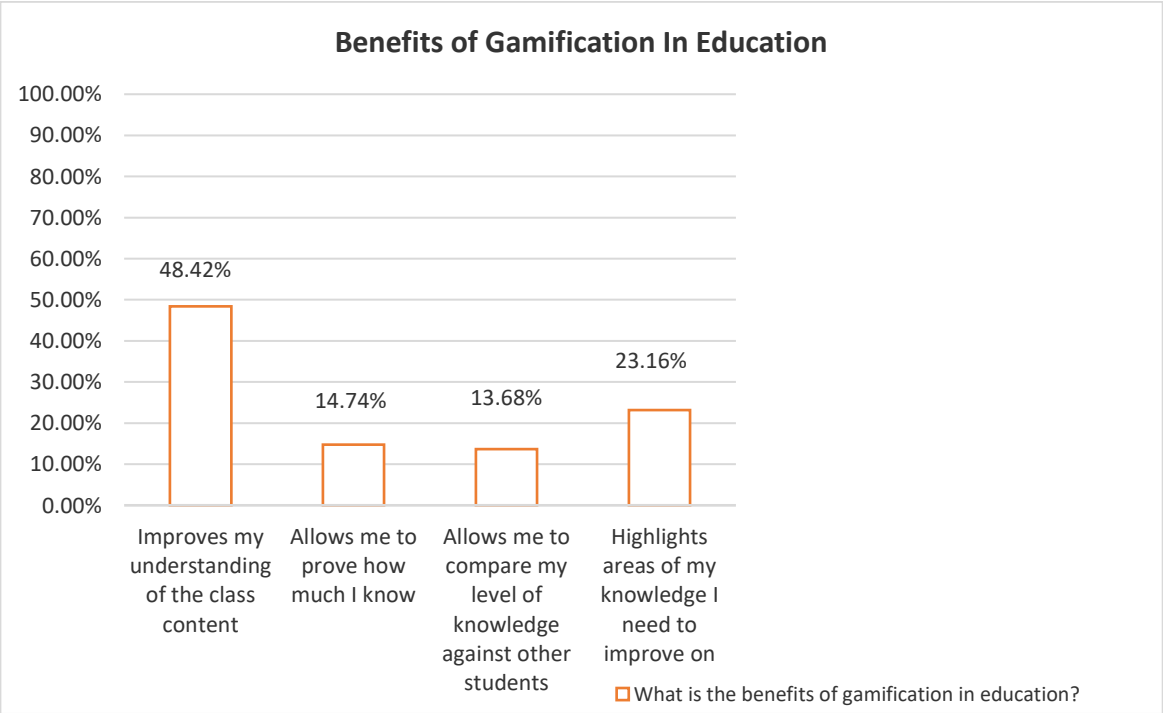

Figure 9: Benefits of Gamification In Education

Knowledge of Gamification

The knowledge of gamification comprised of 9 questions consisting of a Likert scale from "Strongly Agree" to "Strongly Disagree." Table 2 shows the knowledge of gamification of the university students. The descriptive statistics indicate the lowest mean showing agreement for Question 1, "I am familiar with the term gamification" with 49% of university students disagreeing or strongly disagreeing that they are familiar with the term gamification. The highest mean showing agreement was reported on Question 7, "Playing math skill games in the classroom is an example of gamification." Forty-four percent (44%) of the respondents agreed while thirty-four percent (34%) were undecided.

Table 3: Knowledge of Gamification

Survey Question	Rank	Frequency N = 152	Percentage	Mean
I am familiar with the term gamification	SA	6	3.95	2.70
	A	44	28.95	
	UD	27	17.76	
	D	49	32.24	
	SD	26	17.11	
Gamification is the same as playing games in a classroom	SA	7	4.61	3.18
	A	48	31.58	
	UD	67	44.08	
	D	26	17.11	
	SD	4	2.63	

Board games are not examples of gamification	SA	8	5.26	
	A	34	22.37	
	UD	73	48.03	3.05
	D	32	21.05	
	SD	5	3.29	
I do not know what the term gamification means	SA	29	19.08	
	A	48	31.58	
	UD	35	23.03	3.38
	D	31	20.39	
	SD	9	5.92	
There are differences in gamification and gaming in education	SA	7	4.61	
	A	56	36.84	
	UD	73	48.03	3.34
	D	14	9.21	
	SD	2	1.32	
Building website is an example of gamification	SA	3	1.97	
	A	24	15.79	
	UD	76	50.00	2.83
	D	42	27.63	
	SD	7	4.61	
Playing math skill games in the classroom is an example of gamification	SA	12	7.89	
	A	68	44.74	
	UD	51	33.55	3.45
	D	18	11.84	
	SD	3	1.97	
Computerized reading tests are not an example of gamification	SA	13	8.55	
	A	56	36.84	
	UD	61	40.13	3.39
	D	21	13.82	
	SD	1	0.66	
I know how to apply the basic elements of game design to activities in the classroom	SA	6	3.95	
	A	48	31.58	
	UD	71	46.71	3.18
	D	22	14.47	
	SD	5	3.29	

Source: Fisher, D. J., Beedle, J., & Rouse, S. E. (2014). Gamification: A Study Of Business Teacher Educators' Knowledge Of, Attitudes Toward, And Experiences With The Gamification Of Activities In The Classroom.

Attitudes Towards Gamification

The attitudes toward gamification section presented the attitudes of university students on ten gamification questions. As reflected in Table 3, most students (69%) either agreed or strongly agreed that gamification increases motivation for learning. Sixty-five percent of students also agreed or strongly agreed that using games is a more effective instructional strategy than classroom lecturers.

Table 4: Attitudes toward Gamification

Survey Question	Rank	Frequency N = 152	Percentage	Mean
Gamification reduces the amount of time for real instruction in the classroom	SA A UD D SD	11 63 59 15 4	7.24 41.45 38.82 9.87 2.63	3.41
Technology scares me	SA A UD D SD	5 20 18 62 47	3.29 13.16 11.84 40.79 30.92	2.17
Gamification increases motivation for learning	SA A UD D SD	23 82 35 11 1	15.13 53.95 23.03 7.24 0.66	3.76
Using games is a more effective instructional strategy than classroom lecturers	SA A UD D SD	30 70 38 8 6	19.74 46.05 25.00 5.26 3.95	3.72
Competitiveness between classmates is increased with the use of gamification	SA A UD D SD	24 75 39 12 2	15.79 49.34 25.66 7.89 1.32	3.70
I am afraid of using games in my classroom	SA A UD D SD	3 18 42 64 25	1.97 11.84 27.63 42.11 16.45	2.41
Gamification is only appropriate in technology classrooms	SA A UD D SD	12 33 54 40 13	7.89 21.71 35.53 26.32 8.55	2.94
Games are a way to play in the classroom	SA A UD D	14 66 58 11	9.21 43.42 38.16 7.24	3.51

	SD	3	1.97	
Games are not a useful strategy to increase student learning	SA A UD D SD	8 27 35 65 17	5.26 17.76 23.03 42.76 11.18	2.63
Games negatively influence student behaviour in the classroom	SA A UD D SD	6 19 44 54 29	3.95 12.50 28.95 35.53 19.08	2.47

Source: Fisher, D. J., Beedle, J., & Rouse, S. E. (2014). Gamification: A Study Of Business Teacher Educators' Knowledge Of, Attitudes Toward, And Experiences With The Gamification Of Activities In The Classroom.

Conclusion

Based on the findings above, it can be concluded that undergraduate students have a positive attitude towards gamification and they believe that its use of learning in classroom is able to generate their interest in learning. In terms of students' expectation on gamification, they found that t can make classroom learning more exciting, thus enhance their learning environment. Students also believe that gamification would be beneficial by assisting them to improve their knowledge of course material.

Giving these results that students are interested in using games to interact with each other and to relief boredom, gamification might be well appropriate for learning, particularly gamification gives an option to leaders to interact actively to construct learning artifacts. Hence, we recommend that higher education of learning institution in Malaysia may consider adopting gamified learning systems as pedagogy of learning in the 21st century of learners.

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