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Impact of Gamification on Student Motivation and Engagement

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Abstract
Gamification has become a part of the learning platform for students and educators. Gamification using game principles in a non-game context to enhance the desired response from students. The involvement of students is different based on their level of engagement. However, interest in studying is missing; to encounter this, game-based learning is expected to engage students. This study employs a quantitative method with a questionnaire of 200 respondents. The finding shows that gamification helps improve motivation and shows a significant relationship between gamification and student engagement. Policymakers should make gamification in class a mandatory course to boost student engagement.

Keywords: Engagement; Gamification; Learning

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1.0 Introduction

Technology has rapidly changed in this era, and students and educators continue to pursue technology with specific intentions and purposes. The energetic nature of innovation has contributed to different definitions and ideas of innovation in the past related to innovation exchange (Kim & Maloney, 2020; Susilawati et al., 2021). The discourse on the concept of innovation is significant in understanding the nature of innovation and analyzing what the innovation comprises. Technology in education gives a clear vision that breaks the physical barrier.

It provides access to learning resources and opportunities regardless of geographic location or physical limitations. Rotas & Cahapay, 2020; Ebru,2020; & Mpungose,2020). Technology in education has three components: organization and management of educational systems, fulfillment of some additional needs of educators and educational systems and understanding of teaching and learning processes. Understanding technology as a social phenomenon is crucial for working effectively with academic tools (Almaiah, Al-Khasawneh & Althunibat, 2020). Many believe technology only emerged in the 20th century and relate it to complex machinery and gadgets. When technology is directly integrated into an educational environment, such as a school or university, students and teachers can be seen as learners. In the end, technology in classrooms should help raise student achievement.

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Technology can support educational success by removing obstacles to learning and shifting the emphasis from retaining knowledge to using it. To understand the significance and impact of these approaches in educational contexts, it is necessary to consider how they relate to the student and the instructor. Gamification is a useful strategy for getting students interested in academic pursuits. It motivates pupils to engage with the subject matter and maintain their attention and activity. This can be accomplished by developing achievement- and progress-tracking games and enabling students to receive incentives for finishing tasks and assignments. Students become more interested in the subject matter and driven to learn when gameplay aspects like score systems, awards, leaderboards, and memorable experiences are introduced. Analysts believe that gamification, which uses game mechanics, dynamics, and frameworks to promote desirable behaviors, will grow into a multibillion-dollar industry (Lee & Hammer, 2011). It has penetrated many fields, including marketing, politics, health, and fitness.

According to Ozan & Kıncal (2018), students' participation is crucial to their performance and achievement based on formative or summative assessment measurements. Some more active students perform more as they gain more knowledge during learning in class (Mohd et al., 2016 cited in Raju et al.,2021). In this technological era, not all educators have the creativity to include gamification during learning activities (Raju et al., 2021). According to Zickerman and Cunningham (2011), the desire and interest of students to learn in class are missing. Most would rather play video games than read a book or finish homework. To encounter this problem, creating a game based on the learning process to create more engagement from students is needed. Additionally, according to Prensky (2011), the *"containment"* element of an instructional design that is required to interest students can be provided via gaming features. Implementing the learning process in the classroom must pay serious attention to learning motivation, specifically the incentive found in the educational environment. Strongly motivated students have a lot of enthusiasm for educational tasks. Motivation is related to how a person does an activity or task; the more intense and focused the motivation, the more successfully the learner completes the learning activity (Wardani et al., 2020). The main issue of this topic is students' lack of motivation and engagement during class. According to Soria et al. (2020), a survey reported that 76% of undergraduate students identified a lack of motivation during class. Besides that, other aspects influence students' lack of motivation and engagement, such as academic, financial, and psychological impacts.

1.1 Research Objective

The main objective of this study is to explore the usage of gamification among undergraduate students in UiTM Shah Alam. The proposed research objectives are:

I. To identify the usage pattern of gamification in education towards engagement behavior.
II. To investigate the effect of gamification in education on students' engagement behavior.
III. To analyze the game element of gamification in education toward students' engagement behavior

1.2 Operational Definition

Gamification

Gamification is the implementation of game design features in non-gaming contexts. The aim is to establish whether the word and present gamified applications should be understood and developed as an academic idea (Mee et al., 2020).

Classroom

A classroom is a place where students study or learn, which is a room, school, college, or university. Classrooms facilitate communication rather than impose the teacher's ideas on young brains (Susmita & Farhana, 2019).

Behavior

A person's behavior can be watched, measured, and repeated. When they specify behavior precisely, they describe specific activities (Calhoun & A, 2021).

Student's Engagement

Students or school engagement can be defined as a growth process that includes a student's thoughts, feelings, beliefs, and behaviors about the schooling context and his or her lifelong learning trajectory (Furlong & Rebelez-Ernst, 2014).

2.0 Literature Review

The Usage Pattern of Gamification in Education

Gamification, which is defined as the use of video game features (rather than full-fledged games) to enhance user experience and user engagement in non-game services and apps, is predicated on the notion that effortful action fosters motivation and engagement (Deterding et al., 2011). The game was a system in which players engage in certain challenges with rules, interactivity, and feedback that result in quantifiable outcomes, often eliciting an emotional reaction. Games can be created and provided online with multimedia graphics, interactive characters, and automatic scorekeeping, or they can be played face-to-face in a classroom with straightforward interactions and participation.

In past studies, game components such as points, badges, levels, and leaderboards were used. Points are a digital representation of game progress that is used to reward certain behaviors (Doney, 2019). It is used as a success reward or to recognize various forms of work. They motivate pupils to concentrate on the task to reap additional benefits. The motivation for using points is to provide feedback. Levels are the several phases that a player chooses to accomplish a goal. They can be used to indicate a player's progression from one level to the next and symbolize his or her status because a player who can achieve a high level is logically deemed more advanced than

a person who cannot. Levels appeal to a player's sense of competence and autonomy, and they may be more driven if they choose their own level (Huang et al., 2019). Badges are visual representations of achievement utilized to perform a specific role in a gamified course (Huang et al., 2019). They can be used to provide feedback to users on how well they are performing or to instruct users by letting them know what is expected of them.

Student Perception Towards Gamification

The curriculum and delivery methods used in Malaysia's educational system have significantly changed due to information, communication, and technology (ICT) usage. This is due to internet usage, which is predicted to be a driving force in every facet of modern life as we enter the fourth industrial revolution. Information, communications, and technology can potentially improve educational access and standards. Technology aids in students' understanding of technologically assisted learning (Zainal & Zainuddin, 2020).
According to Devendren & Nasri (2022), technology is used by society to satisfy people's needs and interests, including the sharing, storage, and dissemination of information. Gamification perception among students has an impact on both internal and external variables. The way a student views gamification has an impact on both internal and external variables. Internal and external aspects, including interest, attitude, awareness, and effectiveness towards game-based learning, can be considered.

Students' Engagement in Gamification

One crucial factor that affects how well students perform is known as student engagement. Some aspects that affect students' capacity to learn are their past knowledge, their desire to learn, and how the input is presented (Lei et al., 2018). Sustaining the students' interest and participation during class is crucial, which puts educators in a difficult situation. Student involvement is the main factor in student achievement and performance. Based on some scholars, active students perform better because they are more likely to retain more knowledge during the class.

The phrase "student engagement" is frequently used to refer to measurable student involvement in the learning process both within and outside of the classroom (Syed Khuzzan et al., 2021). Different researchers have provided a variety of descriptions of student participation in their research. However, other academics think that it may mostly refer to a multidimensional or meta-construct that comprises several aspects, such as student engagement as a commitment or effort made by students to participate in learning activities (Lei et al., (2018).

Gamification in education enables students to get immediate feedback on how they are doing in the classroom and get credit for completed tasks. Academic success depends on student engagement since it increases their desire to study, satisfaction level, and performance (Manigault, 2014). The amount of time and effort a student invests in their academic experience is known as student engagement. Although numerous studies have been conducted, it is still difficult for teachers to include pupils in classroom activities and the learning process. Implementing a game feature and design, such as using badges and points, in a context other than a game is known as "gamification," and it has been suggested as one strategy to overcome this difficulty (Martin & Bolliger, 2018).

Students' Motivation for Gamification

Intrinsic motivation and pre-existing learning attitudes may lead to task engagement and higher participation. Participation might change unfavorable pre-existing views in the other direction. Strong motivation and high task engagement create a good learning experience (Davis & McPartland, 2012). Motivation is described as "the dynamically changing cumulative arousal in a person that initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritized, operationalized, and (successfully or unsuccessfully) acted out", (Zainal & Zainuddin, 2020). Zickermann & Cunningham (2011) believe that one of the responsibilities of educators is to assist in developing conditions that would promote the emergence of intrinsic motivation. They suggested that extrinsic components, such as points and badges, may be employed to achieve this result and criticized gamification design for failing to focus on intrinsic motivation.

Gamification of educational approaches has the advantage of using what is important from video games to boost student engagement without using any specific game. This goal is to extract gaming components and use these elements in the teaching process to make education more interesting and stimulating. As a result, pupils learn as a game rather than by playing a specific game. Students grow bored with pure learning, whereas games are enjoyable and interesting (Kim et al., 2020). Thus, gamification of education will foster a sense of self-efficacy in which students compete to boost their internal motivation, motivating them to learn and grow academically.

One factor that encourages video game players to participate in playing activities and return for more is fun. Gamification takes inspiration from video games and uses the element of pleasure to engage students and boost their motivation. Learners may absorb information more readily when relaxed and work harder without feeling resentful when motivated (Buckley & Doyle, 2014).

According to Smiderle et al. (2020), gamification in education provides for the same levels of student engagement as games, as well as improving students' skills and optimizing their learning. The researchers evaluated the impact of gamification on students' learning, behavior, and engagement based on their personality attributes in their article. An experimental research design was used for four months, with students randomly assigned to the control (non-gamified) and experimental (gamified) groups. After analyzing the collected data, it was shown that gamification affects pupils differently depending on their personality qualities. In other words, the results of gamification (higher quality work and greater accuracy) differ based on the qualities of the consumers.

Students enjoy flipped classroom gamification and can overcome the obstacles of English learning problems. Gamification techniques help increase motivation, confidence, student communication, and self-control of learning abilities (Adrefiza, 2022). However, motivators such as points, badges, and leaderboards are ineffective for students who are not inherently competitive, and if these components play a key role, students will eventually lose interest. Games can be created to interactively raise the complexity of an activity to match the player's improvement in skill to motivate a person to attain their greatest performance. However, ensuring the appropriate level of complexity can be challenging depending on the purpose of an instructional or serious game (Barata et al., 2015).

2.1 Theory Guiding

Game Based-Learning (GBL)

Game-based learning is a type of gameplay with defined learning outcomes. To engage users, game-based learning refers to borrowing certain gaming ideas and their application to actual contexts. Jean Piaget developed game-based learning in the 20th century as a pedagogical approach. Web-based games, virtual reality games, simulation games, internet games, and multi-user virtual environments games are all part of game-based learning. Game-based learning hinges on students' ability to maneuver through and investigate pertinent game elements in a learning setting. As they play the game, kids may actively practice and learn the proper way to do things while also experiencing the effects of their decisions.

The motivating psychology in game-based learning enables students to interact in a fun and active manner with instructional materials. Designing learning activities that may gradually introduce concepts and lead users toward an end goal is what game-based learning means. It goes beyond just making games for students to play. Traditional games might include rivalry, rewards, points, and feedback loops. To get students interested in studying, these ideas are becoming more and more common in higher education and libraries.

Since game-based learning incorporates psychology, students may benefit from this kind of instruction while having fun, especially when these resources are used. The primary focus of game-based learning isn't only using games to engage students; it's also using games to progressively deliver material and serve as a roadmap for learners to achieve their objectives. Traditional games include prizes, competitions, and challenges that are important even in higher education.

Games can inspire students to learn, especially when the material, such as history, is otherwise dull. Educators utilize digital games to support students' engagement in the learning process and have fun playing games when they are learning. Students are incentivized to play the game until they succeed while taking in all the information that has ended. The drive to play video games is stronger since playing is viewed as entertainment rather than effort. Plenty of games have been discovered that challenge and performance feedback favourably affect a student's desire to study. Thus, using games in the classroom will not only engage students and make learning more interesting but will also encourage them to finish games while they are learning (Nacional, 2023).

2.2 Research Hypotheses

The researcher used quantitative research to complete this study. Thus, hypotheses were constructed by the researcher to answer the objectives of this paper. This hypothesis aims to predict the study's findings while they are still in the early phase of the research. These are the hypotheses that will be tested:

H1. There is a significant relationship between the usage of gamification and student engagement.

H2. There is a significant relationship between motivation and student engagement.

H3. There is a significant relationship between the reward in gamification and students' engagement.

3.0 Methodology

This study is considered under the positivistic paradigm because this paradigm is used widely, as well as positivism. The positivistic paradigm is suitable for this study because it uses a quantitative method. The quantitative method has three data sets: nominal data, ordinal data, and scale data. The positivistic paradigm relies on behaviour. The quantitative method is well suited for this study because it involves numerical representation and manipulation of observation to explain the phenomena. In addition, the suggested methodology is suitable for this research because it is more objective, controlled, and value-free. On top of it, it gathers information from existing and potential audiences by using a sampling method. This study employed quantitative methodology by distributing questionnaires consisting of a few sections covering demographic information, gamification usage, and characteristics of gamification using random sampling among 200 undergraduate students from the University of Teknologi MARA (UiTM), Shah Alam campus. Due to the limited number of classes that use gamification during the learning process, the researcher uses a random sampling method to collect the data from the sample. Random sampling is quicker and more suitable for collecting data among undergraduate students.

This study is suitable for questionnaires because the questionnaire collects data on public perceptions, impressions, and relevance of the information. The questionnaire method can quickly gather the data of information to prepare for a more targeted population. This method can help the researcher to gather the information from UiTM Shah Alam Campus. The time consumed for collecting the data is very quick and helps researchers determine the student group. The questionnaire has five sections: Section A: Demographic, Section B: Reward in gamification affects student behaviour, Section C: Characteristics in gamification affect student behaviour, Section D: Design of gamification affects student behaviour, and Section E: Application of gamification affects student behaviour. The researcher uses a Likert 5 scale for section B until section E to measure the data.

The population selected is UiTM Shah Alam Campus students from all age groups, current semesters, and courses. For the sample, focus on the age group of two samples (male and female) and experience the gamification application during the learning process. The students are from the courses Public Relations (MC242), Instructional and Training (MC246), Publishing (MC245), Forensic Analysis (AS253), Food Science and Technology (AS246), Physics (AS203), Mechanical Engineering (CEEM 222), Actuarial Science (CS242), and Halal Industry Management (IC220).

The researcher tested the reliability of the questions using Cronbach's Alpha Coefficient of Internal Consistency, which is .700. To analyze data, the researcher utilized the Statistical Package for the Social Sciences (SPSS) application version 27. In this research, different types of analysis have been used: descriptive and inferential. Each analysis is to identify as the following: First: Descriptive analysis. Descriptive analysis has several uses. These include detailing the sample's characteristics in the report's technique section. Descriptive analysis is also used to check the variables for any violation of the assumptions underlying the statistical techniques used to address the research questions.

3.1 Operational definition

The Usage of Gamification

Gamification-based learning caters to the educational, technological learning process, allowing for the integration of technology and education laced with game aspects to enhance learning (Sanmugam et al., 2021).

Effect of Gamification

Gamification can help students form relationships with their surroundings, express emotions, gain experiences, have entertainment, relax, and solve problems (Korkmaz & Öztürk, 2019). Gamification boosts student motivation It helps learners obtain positive feedback during the educational process, and learners have a good attitude towards it (Muntean, 2011 cited in Korkmaz & Öztürk 2019).

Element of Gamification

Games are built around mechanics, whereas gamification is built around elements. There are numerous mechanics in the gamification aspect, such as searching, level of difficulty, badge, points, leaderboard, reward, story, avatar, and progress meter, which can be utilized independently or in combination (Hung, 2017).

3.3 Research instrument

The instruments employed were developed based on a past study, and some were modified in response to these research purposes. The survey used English only to provide clearer comprehension and consistent directions. The instrument has three sections: the usage of gamification, the effect of gamification, and the element of gamification. Table 1 shows the summary of the instruments used in this study. The proposed and used questionnaire consisted of a total of 29 questions. The questionnaire was distributed among undergraduate students in UiTM Shah Alam in Malaysia. The questionnaires were distributed online via WhatsApp, Telegram and Email. After receiving the data from the questionnaire, the researcher keyed in the data using SPSS. The variables of this questionnaire have five sections with 29 questions.

Table 1: Allocation of questions and summary of variables

Sec	Variables	Source	No. of Item	Attributes
A	Demography Characteristic	Abbasi et al. (2021)	5	Control variables
B	Usage of Gamification	Yilmaz and O'Connor (2016)	5	Independent variable
C	Effect of Gamification	Högberg et al. (2019)	5	Independent variable
D	Element of gamification	Mosalanejad et al. (2020)	7	Independent variable

4.0 Findings

`4.1 Descriptive Results

The finding shows that undergraduate students from UiTM mostly use gamification in their learning process. Of 203 students, 66% used gamification, while 34% did not use it in their learning process. This shows that educators believe gamification can provide a rich learning environment in which students can construct higher-level information through confusing and difficult trial-and-error possibilities (Mee et al., 2020). Students can study in an engaging, enjoyable way while enhancing their knowledge and grasp of the subject matter through games. (Table 2)

Table 2. Distribution of gamification by respondent (n=200)

Profile	**Frequency**	**Percentage (%)**
Gender		
Male	59	29.1
Female	144	70.9
Age		
18-20	18	8.9
21-23	138	68.0
24-26	47	23.2
Semester		
1	88	43.3
2	11	5.4
3	20	9.9
4	43	21.2
5	30	14.8
6	11	5.4
Using Gamification		
No	69	34.0
Yes	134	66.0

Table 3: The Usage of Gamification

Item	Mean	St. Deviation
The application of the game is free to use.	3.32	1.888

The interface of gamification is easy to use.	2.75	1.397
It was easy to share content with others.	2.79	1.726
It was easy to find the content I needed.	2.71	1.677
It was easy to access shared resources from others.	2.77	1.712

The first objective of this study is to identify the use of gamification in education in relation to students' engagement behavior. Table 3 shows the overview results of gamification usage. Respondents perceive and react positively towards the gamification element in education because the application is free to use with the highest mean (M=3.32). Besides that, the respondents agree that gamification makes it easy to share content with others, with the second highest mean (M=2.79). However, the lowest mean score for gamification is easy to find the content needed by respondents for the mean (2.71). Thus, students engage well with gamification elements in education because it is free to use them while learning without cost, which is one of the usage factors of gamification in education (Table 3).

Table 4: The Effect of Gamification

Item	Mean	Std. Deviation
Gamification improves my learning performance.	2.91	1.803
Gamification improves my learning outcome.	2.90	1.766
Gamification enhances my desire to produce the desired result in my learning.	2.83	1.750
Gamification helps improve my listening in the classroom.	3.06	1.875
Gamification helps improve my studies regularly.	3.27	1.880

The second objective investigates gamification's effect on students' engagement behavior in education. Table 4 shows the overview results of the gamification effect. The respondent agrees that gamification helps them improve their study regularly with the highest mean of (M=3.27), followed by the respondent who agrees that gamification helps them improve their listening in the classroom with a mean of (M=3.06). In addition, respondent also agrees that gamification improves their learning performance with mean (M=2.91). The lowest mean score for gamification enhances their desire to produce the desired results in their learning (M=2.83).

Table 5: Element of Gamification

Item	Mean	Std. Deviation
Using gamification makes me happy.	2.57	1.641
Gamification makes me feel motivated	2.63	1.693
I am playing gamification just for the reward	3.14	1.827
Playing gamification helps me push my limits	2.74	1.710
Using gamification gives me a playful experience	3.00	1.833

The third objective aims to analyze the element of gamification in education and its effect on students' engagement behavior. Table 5 shows the overview of the results of the gamification element. Based on the data, most respondents agree that they are influenced to play games in education to gain rewards. This is proven due to the highest mean (M=3.14). Besides that, respondents admitted that using gamification gives them a playful experience with a mean of (M=3.00), followed by gamification helping them push their limits to score and engage in online education with a mean of (M=2.74). Few respondents felt that gamification motivates and makes them happy due to the lowest score mean of (2.63) and (2.57) respectively.

4.2 Inferential Results

Inferential analysis was tested to study the game element of gamification in education toward students' engagement behavior. In addition, inferential statistics are helpful in quantitative research to forecast the characteristics of the wider population, whereas descriptive statistics help to describe the features of a sample population. The researcher employed the Chi-square test to see if there is a significant or insignificant relationship between gamification and student behavior.

I The Relationship Between Elements in Gamification and Student Behavior

Table 6: The Relationship Between Elements in Gamification and Students' Behavior

		none	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree	Total
Age 18-20	Count	11	1	1	1	4	0	18
	Expected Count	6.1	2.2	.9	.7	8.0	.1	18.0
21-23	Count	50	16	9	6	56	1	138
	Expected Count	46.9	17.0	6.8	5.4	61.2	.7	138.0

24-26	Count	8	8	0	1	30	0	47
	Expected Count	16.0	5.8	2.3	1.9	20.8	.2	47.0
Total	Count	69	25	10	8	90	1	203
	Expected Count	69.0	25.0	10.0	8.0	90.0	1.0	203.0

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.188a	10	.028
Likelihood Ratio	23.007	10	.011
Linear-by-Linear Association	10.876	1	.001
N of Valid Cases	203		
a. 8 cells (44.4%) have an expected count of less than 5. The minimum expected count is .09.			

A chi-square test of independence was performed to examine the relation between rewards in gamification and students' behavior. The table above shows that the p-value of 0.028 is lower than the commonly accepted level of $p<0.05$. Thus, it concluded that there is a significant relationship between rewards in gamification and students' behavior. (Table 6)

II The Relationship Between Usage of Gamification and Student Behavior

Table 7: The Relationship Between Usage of Gamification and Students' Behavior

			Disagree	Agree	Strongly Agree	Total
Age	18-20	Count	11	0	7	18
		Expected Count	6.1	2.7	9.2	18.0
	21-23	Count	50	20	68	138
		Expected Count	46.9	20.4	70.7	138.0
	24-26	Count	8	10	29	47
		Expected Count	16.0	6.9	24.1	47.0
Total		Count	69	30	104	203
		Expected Count	69.0	30.0	104.0	203.0

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.736a	4	.008
Likelihood Ratio	16.368	4	.003
Linear-by-Linear Association	7.952	1	.005
N of Valid Cases	203		
a. 1 cells (11.1%) have an expected count of less than 5. The minimum expected count is 2.66.			

A chi-square test of independence was performed to examine the relation between the characteristics (game element) of gamification and students' behavior. Table 7 shows a p-value of 0.008 is lower than the accepted level, $p<0.05$. This shows that there is a significant relationship between characteristics in gamification and students' behavior.

III The Relationship Between Motivation and Student's Behavior

Table 8: The Relationship Between Motivation and Students' Behaviour

			None	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree	Total
Age	18-20	Count	11	2	1	1	3	0	18
		Expected Count	6.1	5.2	1.5	.4	3.7	1.0	18.0

	21-23	Count	50	39	11	4	29	5	138
		Expected Count	46.9	40.1	11.6	3.4	28.6	7.5	138.0
	24-26	Count	8	18	5	0	10	6	47
		Expected Count	16.0	13.7	3.9	1.2	9.7	2.5	47.0
Total		Count	69	59	17	5	42	11	203
		Expected Count	69.0	59.0	17.0	5.0	42.0	11.0	203.0

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.569[a]	10	.024
Likelihood Ratio	21.966	10	.015
Linear-by-Linear Association	5.763	1	.016
N of Valid Cases	203		

a. eight cells (44.4%) have an expected count of less than 5. The minimum expected count is .44.

A chi-square test of independence was performed to examine the relationship between motivation and students' behaviour. Table 8 shows that the *p*-value 0.024 is lower than the accepted level, p<0.05. This shows that there is a significant between motivation and students' behaviour. (Table 8)

5.0 Conclusion, Limitations and Recommendation

The study examined the students' behavior on gamification among undergraduate students in UiTM Shah Alam Campus. According to the findings, gamification does affect their learning activities. Gamification as a learning tool or becoming a part of the curriculum is the best practice in education to motivate and engage with students while improving their performance during the learning process. In response to objective (1), to identify the usage of gamification in education towards students' engagement behaviour, the data demonstrated that the students mostly agree that gamification does help them during the lesson. Objective (2) is to investigate the effect of gamification in education on students' engagement behaviour. The data demonstrated a positive impact on students' behaviour. In response to objective (3), which is to analyze the element of gamification in the engagement behaviour of education students, The data shows that gamification impacts students, especially learning outcomes. Gamification boosts students' enjoyment and participation in class, preventing them from becoming bored with the main subjects. If the student can increase his or her involvement in the course, his or her academic achievement will improve.

There are some limitations to the study that was carried out. The convenience sampling technique was used by the researcher to collect responses from respondents using an online survey. This sample approach was more likely to be subject to selection bias. To perform a more in-depth examination, future research should involve an interview session with a potential respondent. As a result, the findings had a limited amount of generalizability. Future research is recommended to focus on specific faculty or classroom to obtain generalizable outcome. Future studies can make use the other theory such as Uses and Gratifications Theory (UGT) or Technology Acceptance Model (TAM) to have different outcome.

The traditional method in this technology era is no longer suitable; while the millennials are the generation growing with technology and are more attracted to technology than the traditional method for forecasting and analyzing the data collection, the student is more entertained when doing the gamification during the learning process. This will boost the student's motivation to stay active in class. Educators can always use gamification apps like Kahoot, Quizizz, and Quizlet to improve student performance. This software saves educators from building their gamification platform to assist students in learning more successfully, as not all educators are creative enough to do the same.

6.0 Co-Author Contribution

The authors affirmed that there is no conflict of interest in this article. Author 1 carried out the fieldwork, prepared the literature review, and overlooked the write-up of the whole article. Author 2 wrote the literature review and overlooked the write-up of the whole article. Author 3 wrote the research methodology, did the data entry, and conducted the statistical analysis and interpretation of the results.

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