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BACHELOR OF ARTS IN MULTIMEDIA STUDIES

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**AN EMPIRICAL STUDY EVALUATING THE EFFECTS OF
GAMIFICATION IN AN E-LEARNING ENVIRONMENT**

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This paper prepared by **APRIL FELICIA C. FOJAS** with the title: “**AN EMPIRICAL STUDY EVALUATING THE EFFECTS OF GAMIFICATION IN AN E-LEARNING ENVIRONMENT**” is hereby accepted by the Faculty of Information and Communication Studies, U.P. Open University, in partial fulfillment of the requirements for the degree Course.

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Biographical Sketch

April Felicia “Isha” Fojas, was born on April 1, 2001, in Muntinlupa City. She is the youngest child of Genevieve and Ivan Fojas and the younger sister of Justin Fojas.

She completed her primary and secondary education at Manresa School. There, she graduated top of her section, with honors, and outstanding performance under the General Academic Strand.

In 2018, she enrolled in the University of the Philippines - Open University to pursue her degree in Multimedia Studies. There she discovered her love for all mediums of art, such as writing, drawing, graphic design, photography, and videography. She is also a proud member of the UPLB Mountaineers, serving as their secretary for two consecutive years.

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TABLE OF CONTENTS

Title Page	i
University Permission Page	ii
Acceptance Page	iii
Biographical Sketch	iv
Acknowledgment	v
Table of Contents	vi
List of Figures	viii
List of Tables	ix
List of Appendices	x
ABSTRACT	xi
I. INTRODUCTION	1
Statement of the Problem	2
Objectives of the Study	2
Significance of the Study	2
Scope and Limitations of the Study	2
II. REVIEW OF RELATED LITERATURE	4
III. METHODOLOGY	8
Context of the Study	8
Game Mechanics	8
Evaluating the Gamified System	10
Ethical Clearance and Considerations	10
IV. RESULTS AND DISCUSSION	12
V. CONCLUSION, AND RECOMMENDATIONS	28

Conclusion	28
Recommendations	28
REFERENCES	29
APPENDICES	32

LIST OF FIGURES

Figure 1. Badges designed for the course.....	8
Figure 2. Automatic feedback prompts according to the student's exam grade.....	9
Figure 3. Positive Effects.....	16
Figure 4. Psychological Effects.....	17
Figure 5. Cognitive Effects.....	18
Figure 6. Formation of Good Learning Habits.....	19
Figure 7. Negative Effects.....	19
Figure 8. System Quality.....	22
Figure 9. Information Quality.....	23
Figure 10. Service Quality.....	23
Figure 11. System Use.....	24
Figure 12. User Satisfaction.....	25

LIST OF TABLES

Table 1. Demographic information.....	12
Table 2. Level of agreement of the respondents to the effects of gamification in percentage.....	12
Table 3. Level of agreement of the respondents to the success of the gamified course based on the Information Systems Success Model (Delone & McLean, 2003) in percentage.....	20
Table 4. Students' frequency on course site.....	24
Table 5. Comments by respondents.....	25
Table 6. Comparison of GWA and Discussion Forum engagement between the three batches.....	26

LIST OF APPENDICES

Appendix A. Survey for An Empirical Study Evaluating the Effects of Gamification in an E-learning Environment.....	32
Appendix B. Student Consent Form.....	39
Appendix C. FIC Consent Form.....	42

Abstract

The University of the Philippines Open University (UPOU) is a fully online university that uses open and e-distance learning (ODeL) methods of teaching through the use of a learning management system (LMS) called Moodle, which is considered their virtual classroom. In an ODeL system, students are expected to study independently without meeting with their fellow students and instructors face-to-face. It is said that motivation is the main factor in a student's learning, especially in a distance learning environment. However, distance learners tend to feel easily demotivated, distracted, and isolated as compared to students in a traditional learning environment (Manlapaz, 2020). This can often lead to lower performance and higher dropout rates. To make distance learners feel more motivated, many institutions have proposed the use of gamification as a way to motivate the students to be more engaged in class and improve their grade performance. In this study, the researcher aims to assess the effects of gamification on undergraduate UPOU students and to see if gamification is a factor that helps improve student performance. The results show that gamification has several positive effects on students in UPOU. There is also a significant difference between the performance and engagement of students in a gamified course compared to a non-gamified course.

Chapter I INTRODUCTION

Background of the Study

As technologies continue to advance and more ways of learning are being introduced, students are finding conventional teaching and learning methods to be more uninspiring and uninteresting by the day (Dicheva, Dichev, Agre, & Angelova, 2015). Learning is highly driven by motivation (Glover, 2013, as cited in Alabassi, 2017). In e-learning, a lack of motivation can result in high dropout and low completion rates (Antonaci, Klemke, & Specht, 2019; Bovermann, & Bastiaens, 2020). According to Bawa (2016), distance and online learning programs have a 10-20% higher dropout rate than traditional face-to-face schools. Thus, there is a need to motivate distance learners to make them more engaged in learning.

Many teachers recognize this need to motivate students (Norradin, 2015, as cited in Alabassi, 2018). In an e-learning environment, there are many ways to help motivate students to be more engaged and develop a real desire to learn. In the study by Bawa (2016), it is mentioned that a student's motivation can be directly linked to the course's design together with the student's own attitude towards learning. One of the proposed methods to enhance motivation in e-learning is through the implementation of game elements into the course. This method is also known as gamification.

Gamification is a relatively new concept, but it is slowly gaining popularity in many fields. It is used in several mobile applications, websites, social media platforms, and recently, in learning management systems (LMS) or massive open online courses (MOOCs). Moodle is one example of an LMS. UPOU makes use of Moodle as its main platform for teaching and learning, it is also known as their virtual classroom. Unlike most UP constituent universities, UPOU is completely online. It is an entirely separate university and not an online platform to be used by other UP constituent universities.

The mode of instruction used in UPOU is ODeL, which combines open learning, distance education, and e-learning technologies. In an ODeL setting, students and their instructors do not meet face-to-face. A majority of classes are asynchronous and students are expected to study independently after being given all the resources needed to complete the course, such as modules, videos, quizzes, and exams.

Although this type of learning setup has its advantages, such as fewer expenses, a flexible schedule, and convenient learning, there are also several disadvantages. In an online learning environment, there is barely any social interaction. There are also plenty of possible distractions at home. It takes a lot of self-motivation and self-discipline to succeed in such an environment, but not everyone is capable of self-motivation.

Statement of the Problem

Since one of the factors affecting distance learners is their motivation (Bawa, 2016), some studies encourage the use of gamification in education. It is believed that it can help improve students' intrinsic and extrinsic motivation, which in turn also improves their performance, engagement, and collaboration (Alabbasi, 2017). The Moodle platform already has built-in features to support gamification. Some instructors have taken advantage of these features and have already tried to apply certain game elements to their courses; therefore it is known that gamification is possible in the UPOU setup. However, the effectiveness of gamification as a tool in improving student performance is still unclear. Although most studies are positive-leaning the results are still mixed. Whether it will have positive effects on the UPOU students is what this study aims to know.

Research Question

What are the different effects of gamification on the students and their academic performance? Will gamification help motivate students and improve their performance as compared to students in classes without gamification?

Objectives

The main objective of this study is to understand the effects that gamification will have on students in an e-learning environment. The researcher would also like to compare whether the performance and engagement of the students in a gamified course are better than in previous courses that are not gamified.

Significance of the Study

Because gamification is a fairly new concept, more research still needs to be conducted to fully understand whether it should be integrated into e-learning. As such, one of the main significances of the study is to add to the current pool of studies on gamification. It will also help determine whether gamification should be used in the UPOU learning system, specifically, and if it improves the way UPOU students learn as compared to when gamification is not used. Lastly, it can also help identify which gamification elements are best for motivating the UPOU students.

Scope and Limitations

The main focus of this research is to see how gamification affects UPOU students' engagement and academic performance. The independent variable in this study is gamification. Although it is not the only factor that could contribute to the students'

performance, it is just one of them. The dependent variable in the study is the grade performance of the UPOU students themselves. As such, the samples of the study will only be composed of students enrolled in UPOU, specifically undergraduate students taking the course where gamification is being applied. Because UPOU is an “online university”, the gathering of data will also be done strictly online. Data collection will be conducted during the second trimester of the academic year 2021-2022.

One major limitation in this study is the lack of empirical data testing the impacts of gamification on students’ grade performance by motivating them. The few studies that have gone through empirical experimentation mainly used game elements as external rewards. This has been coined as “pointsification”, the mere addition of badges and points to an existing course and considering it successfully gamified (Robertson, 2010).

The lack of standards for the design and implementation of gamification is another limitation (Seaborn & Fels, 2014). Several game elements can be used in gamifying a course. Aside from badges and points, progress bars, upvoting, feedback, challenges, and so on can also be used. Because there is no one-size-fits-all approach to gamification, it can be hard to identify which game elements are most effective. But these limitations have also opened up the opportunity for further analysis.

Chapter II

REVIEW OF RELATED LITERATURE

According to Deterding, Dixon, Khaled, & Nacke (2011), gamification is “the use of game design elements in non-game contexts.” Seaborn and Fels (2014) further expand the meaning of gamification by explaining what game elements are, saying that these are “patterns, objects, principles, models, and methods directly inspired by games.” Gamification is often used to refer to game-based learning or serious games, although they are related they are separate concepts. According to Hung (2017), game-based learning refers to playing games in order to learn, while serious games are full-fledged games that are used outside of entertainment purposes. What differentiates gamification from these two is that it only focuses on the use of certain game elements to encourage motivation (Dicheva et.al., 2015). In learning, gamification does not imply turning the course offering into a full-fledged game or incorporating games into the course. Rather, it uses game elements to make the course more compelling to the students by appealing to their intrinsic and extrinsic motivation in order to get them to perform better academically.

Motivation is the main factor affecting one's success in distance learning environments (Bekele 2010; Hartnett 2016, 2019; Paterson 2014). The main challenge in distance education is the need to self-organize and study independently. Distance learning can also create feelings of isolation due to the limited social interaction that is common in these settings. These factors can lead to a loss of motivation. Studies have found that distance education courses have a higher drop-out rate as compared to traditional face-to-face courses (Vogel et al. 2018). Many previous studies have pointed out how gamification is directly related to different motivation theories, such as self-determination theory (Alabbasi, 2017; Bovermann & Bastiaen, 2020; Tsay, Kofinas, & Luo, 2018).

Motivation is defined as “a theoretical construct to explain the initiation, direction, intensity, persistence, and quality of behavior, especially goal-directed behavior” (Brophy, 2010, as cited in Hartnett, 2016). It is one of the main driving forces in learning and affects when, what, and how a person learns. It determines whether a person will continue to stay in a course, how engaged they are in a class, and how well they perform (Hartnett, 2016; Paterson 2014; Vogel et.al., 2018). In self-determination theory, there are two main types of motivation that are identified, that is intrinsic and extrinsic motivation (Ryan & Deci, 2000). Intrinsic motivation is defined by Ryan and Deci (2000) as “the doing of an activity for its inherent satisfactions rather than for some separable consequence”. In other words, one is motivated purely by their own satisfaction or inherent interest in something. Extrinsic motivation, on the other hand, is defined as “a construct that pertains whenever an activity is done to attain some separable outcome”(Ryan & Deci, 2000). For example, one is extrinsically motivated to perform better to get higher grades or if they are given some sort of external rewards, such as more playtime or fewer chores. These two types of motivation are said to be directly linked to learning (Bovermann & Bastiaens, 2020; Hartnett, 2016; Kyewski & Kramer, 2018).

In self-determination theory, there are three essential psychological needs of human motivation: autonomy, competence, and relatedness. Autonomy is the ability to make your own choices. Competence is one's ability to achieve certain goals. Relatedness is the need to interact and be connected with others. Achieving competence can increase one's extrinsic motivation while achieving autonomy and relatedness can increase intrinsic motivation (Hansch, Newman, & Schildhauer, 2015). Gamification is seen as a tool that can be used to achieve the three essential psychological needs which will lead to increased intrinsic and extrinsic motivation in students. Aparicio, Vela, Sanchez, & Montes (2012) have proposed different game mechanics for each of the three psychological needs. Under autonomy, they proposed the use of profiles, avatars, macros, configurable interfaces, alternative activities, privacy control, and notification control. To achieve competence: positive feedback, optimal challenge, progressive information, intuitive controls, points, levels, and leaderboards. To achieve relatedness: groups, messages, blogs, connection to social networks, and chat.

In the empirical study conducted by Tsay, Kofinas, and Luo (2018), they designed their courses to show the students' learning progression and provided quick feedback. They had seminar exercises that boosted student interaction. They also awarded badges and had leaderboards to acknowledge their students' achievements. In their study, all of these elements helped to increase the student's motivation which resulted in overall better student performance. It also showed that student performance was significantly higher when using a gamified system, as opposed to students that weren't. Studies by Alabassi (2017; 2018) also showed positive perspectives by graduate students and teachers on gamification.

However, this is not enough to confirm whether or not gamification does indeed boost student motivation and improve their performance. There is still a lack of empirical evidence. Although most studies surrounding gamification are mainly positive-leaning, the results are still mixed. The idea of gamification has also had its fair share of criticisms. Other empirical studies on gamification only focus on external rewards, such as badges. The study by Kyweski & Kramer (2018) evaluated the effectiveness of using badges in an e-learning environment to increase student motivation. Their research findings show that badges have less impact on motivation than is commonly expected. Although badges are one of the most common game elements used in gamification, many critics of gamification have pointed out that it is not enough to just apply badges or a point system into a course and call it gamification.

Several game elements can be used to create a gamified course aside from just points and badges. The mere adding of points and badges onto a course has been coined as "pointsification" (Robertson, 2010). Points and badges are great tools for rewarding students and are said to have short-term effectiveness in boosting motivation (Nicholson, 2015 as cited in Huan, 2017). But according to critics, one cannot expect a course to be successfully gamified with the use of points and badges alone. Feedback, challenges, upvoting (likes), narratives, and progress bars

are also examples of commonly used game elements in gamification (Antonaci et.al., 2019) that can be used together with badges and points. These game elements can either have short or long-term effects on the student's motivation (Hansch et.al., 2015).

There are five different gamification user types, Socializer, Philanthropist, Free Spirit, Achiever, and Player. Each type of gamification user is motivated differently (Diamond et al. 2015; Korbas 2015; Marczewski, 2015, as cited in Bovermann & Bastiaen, 2020). The Socializer for instance is driven by the desire to connect with others. The main gamification element and mechanic that works best for them are those that encourage social discovery. The Player, on the other hand, is extrinsically motivated, mainly by acknowledging their achievements. For the Player user type, the gamification mechanic that works best for them is leaderboards. Since it's highly unlikely that one class has the same type of students or gamification user types, it is not enough to just use one or two gamification elements or mechanics that only focus on external rewards. Multiple gamification elements or mechanics should be used in the course (Mohamad, Salam, & Bakar, 2017) and it should be diversified to fit the needs of each gamification user type.

Gamification is not one-size-fits-all (Hansch et.al., 2015). The effectiveness of gamification is highly contextual (Bovermann & Bastiaens, 2020; Hansch et.al., 2015; Tsay et.al., 2018). It should also be mentioned that because not all students are the same, some may find that certain game elements can affect them negatively. In the study of Alabassi (2017), the negative effects of gamification were also evaluated. Although the average answer shows that a majority of the students do not believe that gamification had a negative impact on their learning, the issue of competitiveness was brought up. Of the 47 participants, 15 (32%) of the participants agreed that the game elements created negative feelings among students due to competitiveness. Twenty-three percent of the participants also agreed that they were more concerned about collecting points rather than effectively learning the materials. This just furthers the point that the use of badges, points, and other external rewards should not be the main focus of gamification.

That is why when designing a gamified course, one should use the concepts of user-centered design and situated motivational affordance. User-centered design is the process of designing with a focus on the needs, wants, and limitations of the end-users throughout the entire design process (Gulliksen et al., 2003; Norman, 1990 as cited in Tsay et.al., 2018). Situated motivational affordance is the idea that the user's background should match the gamified setup (Deterding, 2011). Motivational affordances are what give users the satisfaction of experiencing their psychological needs. As mentioned before, the three main psychological needs to achieve intrinsic and extrinsic motivation are autonomy, competence, and relatedness. Previous research has shown that gamification in educational contexts may provide these motivational affordances to students (Dicheva et.al, 2015), especially when several gamification elements are used (Tsay et.al., 2018). The goal then is to design something that allows the end-users to satisfy their motivations, by keeping the users' background, abilities, and skills in mind. But without enough

details on the different characteristics of the users, the best thing to do is to implement several varied game elements that can help achieve these motivational affordances.

Chapter III METHODOLOGY

Context of the Study

The course chosen for the study is one of the major core courses under the Bachelor of Arts in Multimedia Studies (BAMS). The course is held on the Moodle platform and the game elements that will be incorporated into the course are those that can help promote autonomy, relatedness, and competence in the student users.

Game Mechanics

To give the students a sense of autonomy the students were given the choice to participate in the study. During their introduction week (Feb. 21-25), all the students were given an orientation about the course and the study. Initially, the students were supposed to be separated into sections where one batch of volunteers will participate in the gamified course, while the other participants will remain in the non-gamified course. Due to the limitations of the course site, the students could not be separated into sections. Thus, all students were part of the gamified course. However, only students that give their consent to participate in the study were included in the data. To further encourage autonomy, there were tasks that had no time limit to them, such as discussion forums and quizzes that they could choose to answer or submit at any time within the term.

Moodle also has a built-in feature that allows badges and leaderboards to be integrated into the course. This was used to give students a sense of competence when they were rewarded for their various achievements. A total of 12 badges were designed for the course. Figure 1 displays each badge and its criteria. The leaderboard was used to display the top scorers in the different quizzes, exams, and discussion forums in the course so that the students were able to see their progress compared to their fellow students.

Lab Rat Badge	Unit 1 Badge	Unit II Badge	Unit III Badge	Brainiac in the Making Badge	Socializer Badge
					
Awarded to students who agree to join the experiment	Awarded once all Unit 1 tasks are completed	Awarded once all Unit 2 tasks are completed	Awarded once all Unit 3 tasks are completed	Awarded when all quizzes are completed	Awarded when all discussion forums are answered

Graduate Badge	Math Maniac Badge	Team Player Badge	Star of Stars Badge	You're A Star Badge	Overachiever Badge
					
Awarded once all course tasks from Unit 1 to 3 are completed	Awarded when the final exam is completed	Awarded once all assignments are completed	Awarded to the student that earns the most stars at the end of the term	Awarded when a student gets the most stars in a discussion forum	Awarded when all badges offered in the course are collected

Figure 1. Badges designed for the course

Discussion forums were used to encourage interaction between students and to give them a sense of relatedness toward their peers. For each post a student made in their discussion forum, they were awarded 5 stars. Each reply by another student earned them an extra star. To give the students a sense of relatedness to their instructors, the instructors would give feedback. However, since the instructor cannot give feedback individually due to the large size of the class, they set up an automatic feedback mechanism for quizzes and exams. Students are shown a different prompt depending on the grade they earned at the end of the exam.

Exam Grade	Prompt
90% - 100%	"Excellent work! Keep it up"
80% - 89%	"Good work! You're getting there"
60 to 79%	"Nice try! Keep reviewing"
>60%	"Please continue reviewing this unit's resources"

Figure 2. Automatic feedback prompts according to the student's exam grade

These game mechanics had no direct impact on the student's grades. The person with the most badges or stars accumulated at the end of the term was not given bonus points for their final grade. Similarly, students who had the least badges or stars were not given deductions. These were merely tools to motivate them to engage more and study harder. Their output and performance in the activities determined their final grade, not the number of badges or stars they earned.

Evaluating the Gamified System

To understand how effective the gamified system was, the researcher gathered information in two ways. First, the researcher analyzed the grade performance and engagement under the gamified course. To analyze the grade performance, the mean grade of the current batch with gamification was compared to the mean grades of the previous two batches that took the course without gamification. The previous batches were used to compare the grades because they had the same faculty-in-charge and course content. These batches were also the only batches that were able to take the course during a pandemic setting. To analyze the students' engagement, the data of their activity in their discussion forums were gathered. Only students who gave their consent were included in the data. This was to ensure the ethical soundness of the study; however, it may have affected the statistical results.

Second, the students who agreed to answer the survey will be given a questionnaire two weeks before their final exam. The questionnaire is composed of three separate parts. The first part is to collect the demographic information of the participants. The second part is to evaluate the effects of gamification on the students. This part of the survey was based on a survey in a similar study on gamification done by Alabassi (2017). While the third part is based on the Information Systems (IS) Success Model (Delone & McLean, 2003) which evaluates the system quality, information quality, service quality, user satisfaction, system use, and net benefits.

System quality is the technical aspect of the gamified system. This evaluates whether the system was easy to use, reliable, flexible, and functional. Information quality refers to the information used within the gamified system, such as the course itself and the different gaming mechanics used. This evaluates whether the information was relevant, consistent, accurate, and timely. Service quality refers to what the students think the gamified course should have offered compared to what was offered. User satisfaction refers to the opinions of the students on their experience using the gamified system. System use refers to how dependent the students were on the gamified system. Lastly, net benefits refer to the impact or benefits of the gamified system to the students. This was measured by analyzing the grade performance of the students as mentioned above.

Ethical Clearance and Considerations

To keep the study ethically sound, the students were oriented during the first week of classes regarding the research. They were also provided with an informed consent form that contained further information about the study, including the various risks that they might encounter during the research. It was also stated in the consent form that the student's participation is purely voluntary. Any information collected from the students who gave their consent will remain confidential and their identities will remain anonymous. The information of the students who chose to opt-out of the study was not included in the research. Opting out of the study did not affect their grades negatively. No bonus points were given to the students who chose to

participate in the study. It was also included in the consent form that only students who are 18 years old and above were allowed to participate in the study. The primary researcher and their thesis adviser also received ethical training.

Chapter IV RESULTS AND DISCUSSION

The objective of this study was to assess the effects of gamification on students in an e-learning environment such as the UPOU MyPortal. The results of this study show mainly positive results. The data was gathered through an online survey that was divided into three major parts. The first part of the survey was to gather the demographic information of the students seen in Table 1. A majority of the respondents were between the ages of 18 to 24 years old, female, and based in the Philippines. There is a fair amount of both employed and unemployed students.

Table 1. Demographic information ($n = 41$)

Variable	Number (%)	Variable	Number (%)
<i>Age</i>		<i>Gender</i>	
18-24	36 (88%)	Male	9 (22%)
25-30	2 (5%)	Female	31 (76%)
31-36	3 (7%)	Prefer not to say	1 (2%)
<i>Job Status</i>		<i>Student Status</i>	
Employed	15 (37%)	Local	40 (98%)
Unemployed	26 (63%)	Offshore	1 (2%)

The second part of the survey, as seen in Table 2, was based on a similar study conducted by Alabassi (2017). It is composed of 30 questions and uses a five-point Likert scale ranging from strongly agree to strongly disagree. The questions were divided into five sections. Figures 3 to 7 display the summary of the results of each section from Table 2.

Table 2. Level of agreement of the respondents to the effects of gamification in percentage

Items	Total	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Positive Effects of Incorporating Game Elements in MyPortal						
The game elements fueled my interest to compete	41	37%	27%	24%	7%	5%
The game elements fueled my interest to work hard	41	37%	34%	17%	7%	5%

The game elements motivated me to succeed	41	39%	24%	27%	10%	0%
Average	41	38%	28%	24%	8%	3%
Psychological Effects of Incorporating Game Elements in MyPortal						
The game elements increased my sense of belonging in the virtual classroom	41	32%	29%	24%	10%	5%
The game elements reduced the feelings of loneliness I used to feel in an e-learning environment	41	29%	34%	24%	10%	2%
The game elements made me feel more connected to my classmates	41	37%	24%	29%	7%	2%
The game elements made me feel more connected to my professor	41	32%	20%	34%	10%	5%
The game elements reduced the feelings of boredom I used to feel in a course without gamification	41	34%	32%	20%	10%	5%
The game elements reduced the feelings of anxiety that I used to feel in a course without gamification	41	17%	46%	22%	7%	7%
The game elements made me feel more stress-free as compared to a course without gamification because it is associated with the feelings I have when I play games.	41	24%	32%	32%	5%	7%
The game elements changed my perspective on the negative views of	41	39%	22%	29%	10%	0%

online learning that it is difficult and boring.						
I enjoyed learning in a course with gamification.	41	39%	41%	12%	7%	0%
Average	41	31%	31%	25%	8%	4%
Cognitive Effects of Incorporating Game Elements in MyPortal						
Learning in a class with gamification increased my feelings of competence	41	27%	44%	17%	10%	2%
The game elements help me remember my lessons for a longer period of time	41	17%	41%	24%	12%	5%
The game elements helped improve my concentration while studying	41	22%	32%	34%	7%	5%
The game elements motivated me to pay attention to any changes in the course that may give me more points	41	29%	32%	29%	2%	7%
Average	41	24%	37%	26%	8%	5%
Formation of Good Learning Habits as a Result of Using Game Elements in MyPortal						
The game elements motivated me to do more than I was required to do	41	34%	27%	27%	10%	2%
The game elements motivated me to complete all the course requirements	41	41%	29%	20%	7%	2%
The game elements motivated me to participate more in the discussion forums to gain more stars	41	44%	34%	12%	7%	2%

I was more motivated to interact with my classmates	41	37%	29%	29%	5%	0%
I was more relaxed because I knew that there were tasks that had no deadline, which I could complete any time before the end of the trimester	41	54%	22%	22%	0%	2%
I was more cautious when taking quizzes or exams because I knew that I only had a certain amount of time to finish it and had only one chance to answer it	41	56%	24%	20%	0%	0%
I studied harder for exams because I knew that I only had a limited amount of time to finish it and had only one chance to answer it	41	49%	29%	17%	5%	0%
Seeing my grades right after a quiz or exam motivated me to do better in the next one.	41	63%	27%	10%	0%	0%
Seeing the automatic feedback at the end of the quiz motivated me to do better in the next one.	41	56%	29%	15%	0%	0%
Average	41	48%	28%	19%	4%	1%
Negative Effects of Incorporating Game Elements in MyPortal						
The game elements created negative feelings between students due to competition	41	7%	12%	20%	27%	34%
The game elements discouraged students to form strong relationships	41	5%	2%	12%	49%	32%
The game elements lowered my motivation to complete the course	41	5%	10%	12%	37%	37%

The game elements increased my anxiety while working on the course	41	12%	15%	27%	27%	20%
The game elements made me more conscious about gaining stars, badges, and other external rewards rather than effectively learning in the class.	41	20%	24%	27%	22%	7%
Average	41	10%	13%	20%	32%	26%

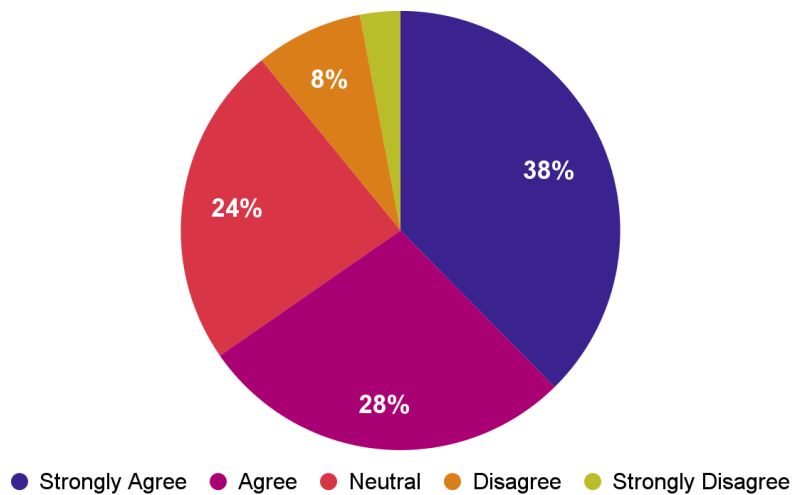


Figure 3. Positive Effects of Incorporating Game Elements in MyPortal

The first section was used to understand the positive effects of incorporating game elements into the UPOU MyPortal. The results show that 66% (38%+28%) of the students agree that the game elements fueled their interest to compete, work hard, and succeed in their academics. Some studies such as Kyewski & Kramer (2018) have mentioned that competitive game elements, such as badges, leaderboards, and points, may be demotivating. However, similar to Alabassi (2017), the results of the survey show that gamification may promote healthy competition that motivates the users to work harder rather than demotivate them.

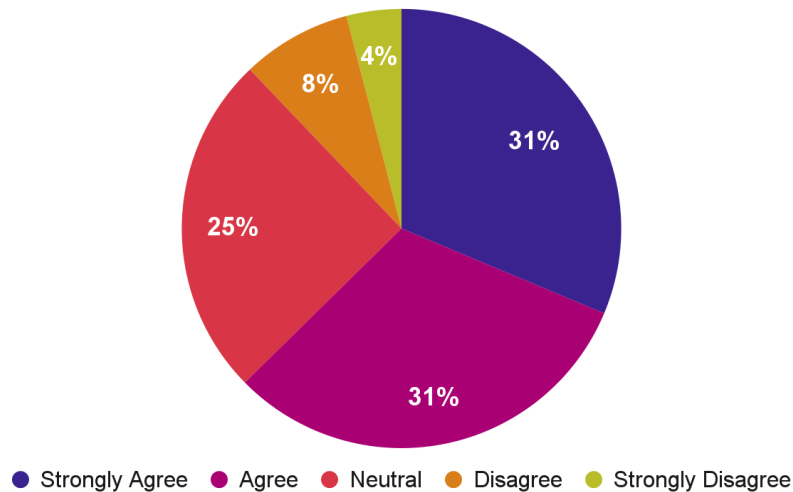


Figure 4. Psychological Effects of Incorporating Game Elements in MyPortal

Distance learning settings tend to have lower completion rates as compared to face-to-face settings due to feelings of isolation and a lack of support (Paulus & Scherff, 2008). Studies have also shown that students in distance learning environments tend to feel more stress (Challenge Success, 2021), anxiety, and boredom (Francis, Wormington, & Hulleman, 2019). All of these feelings tend to have adverse effects on student performance. These feelings may have even increased due to the COVID-19 pandemic. However, the findings show that gamification can be used to alleviate such feelings. 62% (31%+31%) of the respondents agreed that the game elements helped increase their sense of belonging and connectedness, and even reduced feelings of loneliness, stress, anxiety, and boredom. This corresponds to the study by Fajri, Haribowo, Amalia, & Natasari (2021) that gamification can help reduce stress and make interacting with learning management systems more fun and pleasurable. Furthermore, when the respondents were asked to share their experience with the gamified course, two of the respondents said that they enjoyed the course and had fun because of gamification.

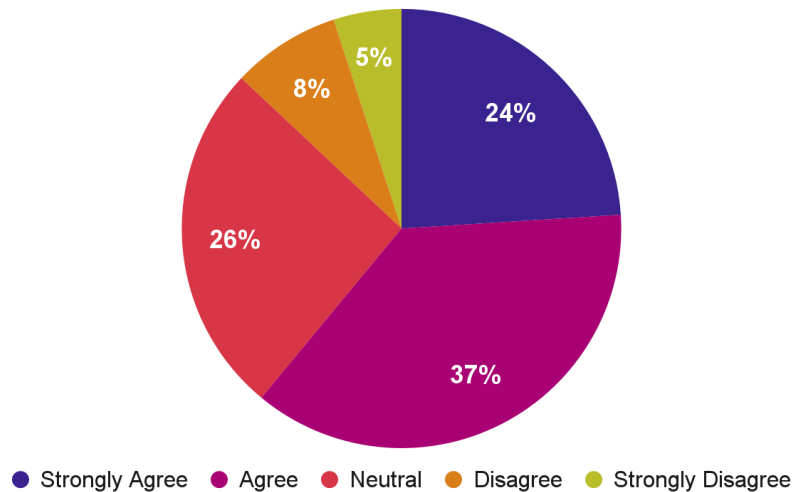


Figure 5. Cognitive Effects of Incorporating Game Elements in MyPortal

Studies on the cognitive effects of gamification are quite limited. One study by Dominguez, et. al. (2013) found that gamification was effective in motivating students to be more engaged in class. However, they did not see any improvement in the student's memory retention or concentration. The results of this study suggest otherwise. 61% (24%+37%) of the respondents felt that the game elements had not only increased their feelings of competence but, it also helped them remember their lessons for longer periods of time, increased their concentration, and made them more attentive to changes in class that could help them earn more points. One respondent said, "I would often visit the portal for any engagements with the other students or if they interacted with my post or not." Another respondent said, "...it [gamification] helps a lot to understand the topics better." This corresponds to the study by Sanmugam, Abdullah, & Zaid (2014) that suggests that gamification can have an impact on the cognitive aspects of students when game elements are implemented in a meaningful way.

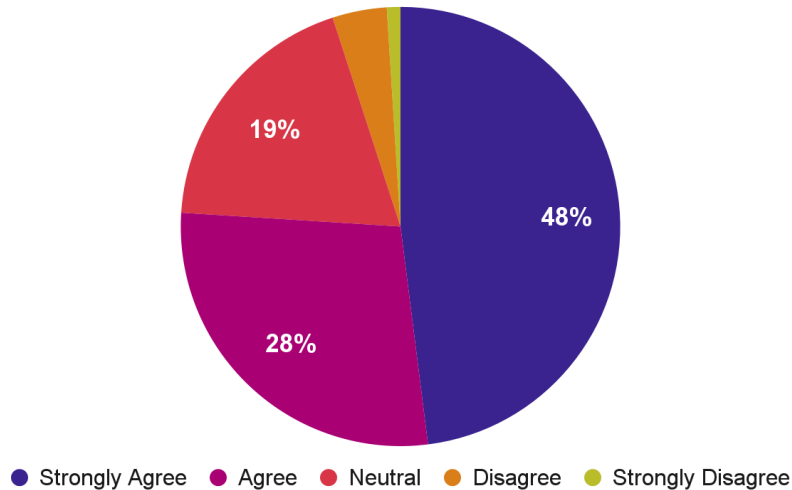


Figure 6. Formation of Good Learning Habits as a Result of Using Game Elements in MyPortal

The findings show that 76% (48%+28%) of the respondents agreed that gamification motivated them to do more than they were required to, complete all their course requirements, actively participate in class, and do better in exams. This corresponds to the framework proposed by Filippou, Cheong, & Cheong (2014) that gamification can be used as a trigger to improve students' study habits. In their framework, they suggested that gamification can be used to make coursework more fun. They believed that doing so will make the students *want* to improve their study habits replacing the notion in traditional learning settings that students *ought* to improve their study habits. By replacing the students' belief that they *ought* to study with a *want* to study, the students will be more motivated to change their study habits.

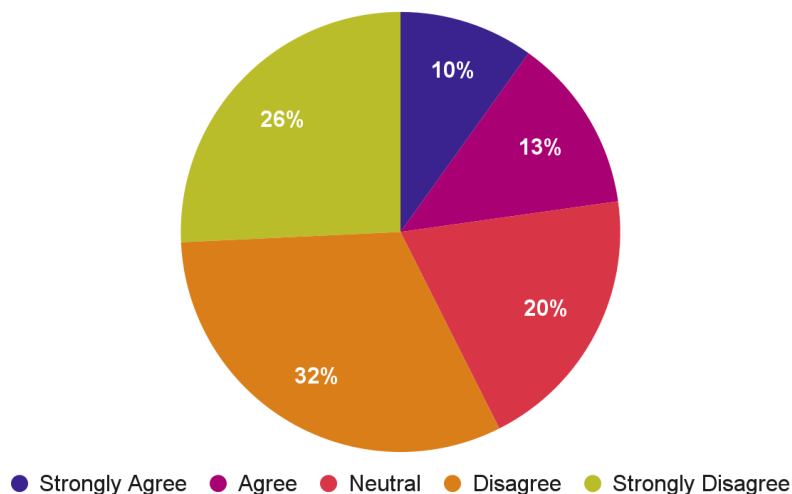


Figure 7. Negative Effects of Incorporating Game Elements in MyPortal

Although gamification has proven to have positive effects on students' engagement, it does not always positively affect everyone. It has been pointed out that it also tends to have negative effects on students. Some of the identified negative effects of

gamification according to Phung (2020) that it could make students feel bored, demotivated, helpless, stressed, stupid, annoyed, lose interest and confidence, uncomfortable, reluctant, distracted, and want to give up. A lot of these negative feelings are usually due to competition or frustration towards how the game elements function. However, the results of the survey show that a small percentage of the respondents experienced the negative effects of gamification. More than half (26%+32%=58%) of the respondents disagreed that gamification made them experience negative effects, only 23% (10%+13%) agreed.

The third part of the survey, as seen in Table 3, was to understand how successful the gamified course was based on the Delone and McLean (2003) IS Success Model. In the IS Success Model, there are six dimensions of success: system quality, information quality, service quality, system use, user satisfaction, and net benefits. Only the first five dimensions were used in the survey, while the net benefits or the improvement of individual or organization performance were evaluated by comparing the general weighted average (GWA) of the students in the gamified course to those of the previous batches without gamification. Figures 8 to 12 summarize the results in Table 3.

Table 3. Level of agreement of the respondents to the success of the gamified course based on the Information Systems Success Model (Delone & McLean, 2003) in percentage

Item	Total	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
System Quality						
It was easy to use/navigate the course site even with the game elements	41	54%	32%	12%	2%	0%
The course site with game elements made it easier to learn	41	56%	20%	20%	5%	0%
There were no technical difficulties when it came to the game elements on the course site	41	41%	37%	17%	5%	0%
Average	41	50%	30%	16%	4%	0%
Information Quality						
The game mechanics were explained clearly	41	56%	37%	5%	2%	0%

The game elements added were relevant to the course	41	46%	34%	20%	0%	0%
The game elements and mechanics were easy to follow and understand	41	56%	37%	7%	0%	0%
Average		53%	36%	11%	1%	0%
Service Quality						
The game elements added to the course exceeded my expectations	41	24%	34%	34%	7%	0%
I wish that they had added more game elements to the course	41	32%	29%	29%	10%	0%
There were certain game elements that I wanted to change or remove	41	10%	10%	51%	22%	7%
Average		22%	24%	38%	13%	2%
System Use						
The game elements made me visit the course site more often	41	34%	41%	15%	7%	2%
The game elements made me more active in the course site	41	39%	37%	17%	2%	5%
The game elements made me more motivated to study	41	37%	24%	32%	5%	2%
Average	41	37%	34%	21%	5%	3%
User Satisfaction						
		Highly Satisfied	Satisfied	Neutral	Unsatisfied	Very Unsatisfied
How satisfied were you with the game elements added in the course	41	41%	39%	20%	0%	0%

How satisfied were you with the game mechanics	41	32%	44%	24%	0%	0%
How satisfied were you with the overall experience of the gamified course	41	49%	37%	10%	2%	2%
Average	41	41%	40%	18%	1%	1%

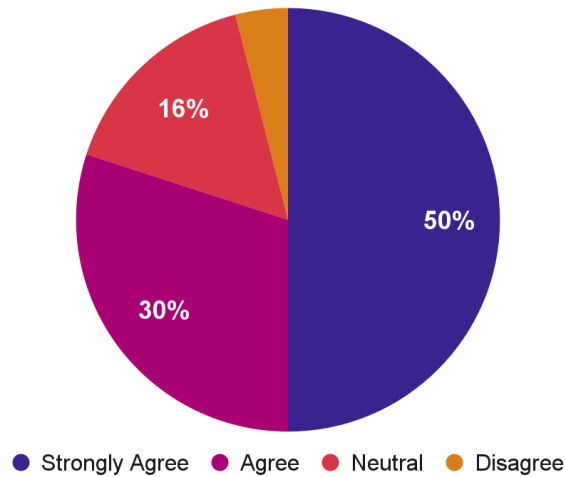


Figure 8. System Quality

In measuring the system quality of the gamified course, the ease of use, system flexibility, system reliability, and ease of learning are the main characteristics to consider. The findings show that 80% (50%+30%) of the respondents agree that the gamified course was easy to use and that the game elements made it easier to learn. They also agreed that there were no technical issues when it came to the game elements on the course site.

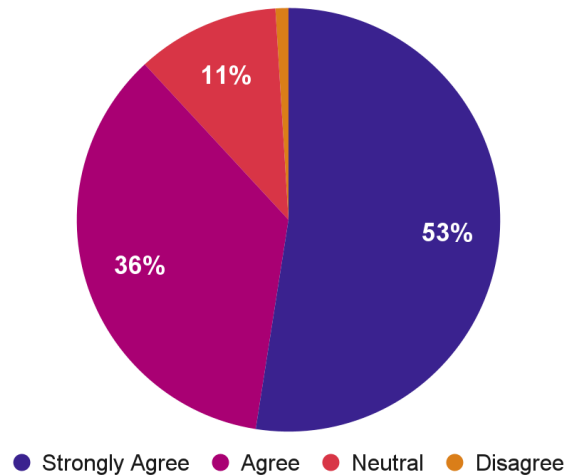


Figure 9. Information Quality

When measuring information quality, the main focus is on the output of the system rather than the system itself. Some of the characteristics to consider when evaluating information quality are the relevance, understandability, completeness, and usability of the outputs, or in this case the game elements and mechanics. The results show that 89% (53%+36%) of the respondents agreed that the game mechanics were explained clearly and were easy to follow and understand. They also agreed that the game elements added to the course were relevant.

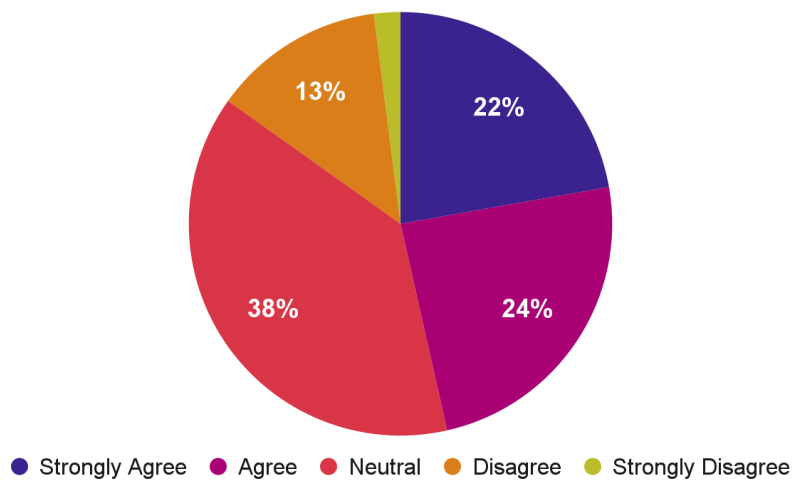


Figure 10. Service Quality

In e-commerce, this is usually used to evaluate the quality of service in terms of responsiveness, empathy, and accuracy of the IS department or IT support personnel. But in the context of this study, since there is no actual service being offered to the students, the researcher decided to evaluate the service quality of the game elements by comparing the students' expectations of the gamified course to their perceptions of it. The results show that 46%(22%+24%) of the respondents agree that the gamified course exceeded their expectations and that they wanted more game elements to be added to the course.

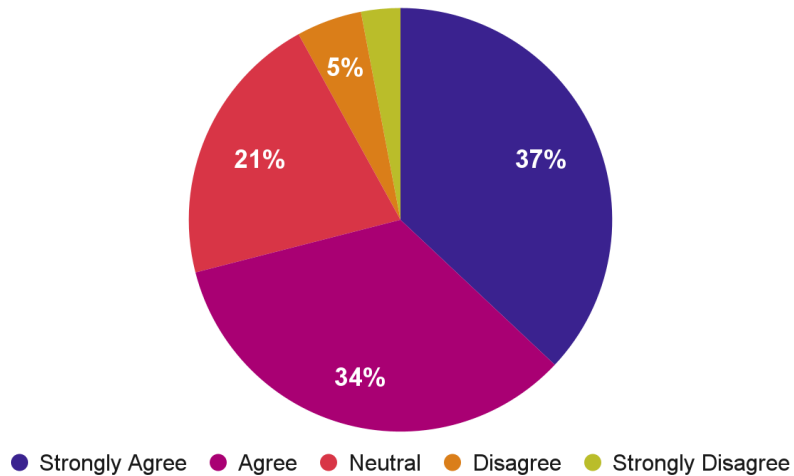


Figure 11. System Use

Table 4. Students' frequency on course site (n=41)

Frequency on Course Site	Number (%)
Once a week	4 (10%)
2-3 times a week	14 (34%)
4-5 times a week	17 (41%)
6-7 times a week	6 (15%)

When measuring system use, some of the factors to consider are the frequency of use and the effects of the use. The results show that 71% (37%+34%) of the respondents agreed that the game elements made them visit the course site more often, made them more active, and motivated them to study. Table 4 displays how many times students visit the course site in a week. The majority of the respondents say they visit the course site four to five times a week.

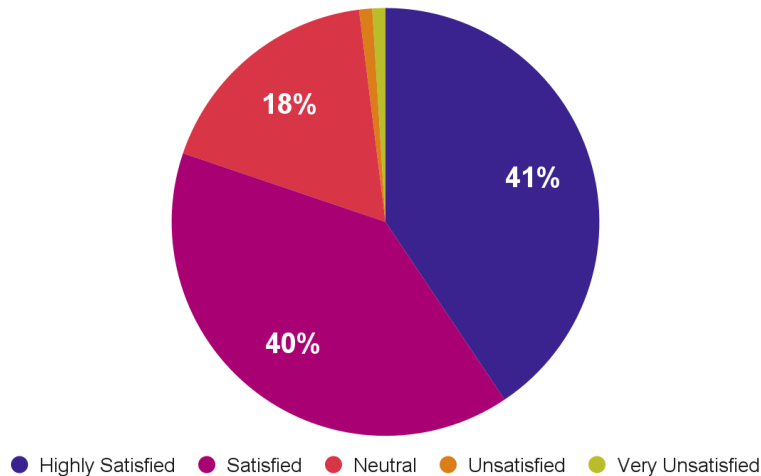


Figure 12. User Satisfaction

In terms of user satisfaction, 81% (41%+40%) of the respondents say that they are satisfied with the game mechanics, game elements added to the course, and their overall experience with the gamified course. To get a better idea of the student's satisfaction with the gamified course, the respondents were also asked to give their comments on their experience. This was not a mandatory question. Only nine out of the 41 students who answered the survey gave comments.

Table 5. Comments by respondents

Comments by respondents	+/- Response
I actually love gamification because this learning strategy motivated me throughout my experience in the course. I would often visit the portal for any engagements with the other students or if they interacted with my post or not. Whether it affects my grades or not, collecting stars and badges are effective for motivation plus it feels like I really accomplished my tasks and received a satisfying reward. I'm honestly happy that this is implemented in our course and I hope it will also be available in most courses that are quite challenging or difficult to learn especially when it comes to this environment when distance learning reigns.	Positive
This was a fun method of learning that I do hope gets implied to all the courses because being able to have fun while studying isn't bad, but it helps a lot to understand the topics better. I do want more games though but with the gamification, my to-do list for this course has never been lighter.	Positive
I enjoyed this course, and I feel like I learned more because it is gamified. I hope to see more gamified courses in the future.	Positive
One of the best features of this is the badges. It really makes me feel motivated	Positive

Based on my experience, I don't think that gamification is totally effective in raising the motivation and interaction amongst students. Maybe in the discussion forums. But many of the working and non-working students don't really seem to prioritize getting badges due to personal reasons such as work, household chores, and maybe simply just wanting to have more rest time for themselves. It is most often that the students with no work are the ones who are highly motivated to participate in such activities but for some, they would rather finish the courses with the bare minimum due to more important necessities and priorities. It kinda actually increases the anxiety of deadlines for me.	Negative
I honestly don't like to foster competitive behavior. Although it can be beneficial in some cases, I can't completely agree with this method. Comparing yourself with others increases anxiety even if there is nothing to worry about.	Negative
It's so minimal that I'm incredibly indifferent about it.	Negative
My experience as a working student is not that easy. I'm having a hard time making it balance sometimes due to workload.	Negative
The gamification was good. However, instead of just giving badges, maybe you can add real fun games that we can play	Mixed

Table 5 shows a mix of both positive and negative comments from the respondents. Some of the positive effects that the respondents experienced with gamification is an increase in motivation to actively participate and engage in their course. They also felt that it helped them understand the topics better and learned more. The common positive comments regarding gamification are that it made learning more fun and really motivated them because of the rewards (badges). However, not all students felt the same way. The respondents who responded negatively said that they felt more anxiety because of the competitive nature that comes with gamification. It's also important to point out that the negative comments came from two working students. A few students also felt that the game elements included in the course were too minimal.

Table 6. Comparison of GWA and Discussion Forum (DF) engagement (0=no post in DF; 1=at least one post in DF) between the three batches

Academic Year	Total	GWA	DF 1	DF 2	DF 3
Non-Gamified Batch 1	159	65.91	4 (3%)	11 (7%)	6 (4%)
Non-Gamified Batch 2	179	75.27	0 (0%)	3 (2%)	2 (1%)
Gamified Batch	59	86.97	59 (100%)	59 (100%)	59 (100%)

The sixth dimension in the IS success model is net benefits. This refers to the positive impact or benefits the IS contributed to the users and to the organization. For this study, the general weighted average (GWA) and the engagement of the

students in their DFs were used to measure the net benefits. Table 6 shows the comparison of the GWA and DF activity between the three batches (two non-gamified batches and one gamified batch).

Although there is a big gap in the total number of students for each batch there is a clear difference between the batches' engagement in the DFs. In both non-gamified batches, only a small percentage of the students posted in their DFs. In the gamified batch, all students participated in all three DFs. This could be due to the stars that the students can collect by posting in the DFs. By earning the most stars the students have a chance at being part of the leaderboard and earning a badge. However, it should also be considered that for non-gamified batches the DFs were not graded, while the DFs for the gamified batch were graded. The fact that the DFs were graded for the gamified batch may have also contributed to the student's increased participation. It should be mentioned that the stars are not included in the criteria for grading the students' posts in the DFs. They were just included to motivate the students to actively engage with the posts.

One of the students who gave their comments in the survey said that "Whether it affects my grades or not, collecting stars and badges are effective for motivation...". Moreover, when asked in the survey whether the game elements motivated them to participate more in the discussion forums to gain more stars, 78% of the respondents said that they agreed. It is unclear whether it was the game elements that had more of an impact on the students to be more active in the DFs or the fact that the DFs were graded, but both factors definitely contributed.

Chapter V

CONCLUSION AND RECOMMENDATIONS

Conclusion

The main objective of this study was to understand the effects that gamification will have on students in an e-learning environment such as UPOU. Another objective was to see whether the performance and engagement of the students in a gamified course are better than in previous courses that are not gamified. The results of this study show that gamification has various psychological and cognitive effects on students. The students also believe that they formed better study habits, became more active and engaged in class because of gamification. Although the survey mainly showed positive results, some students have pointed out that the competitive nature of gamification has some negative effects on them, such as increased anxiety. These results are consistent with the study conducted by Alabassi (2017). When comparing the performance and engagement of the batches without gamification to the batch with gamification, it showed that the batch with gamification had better overall performance and engagement. This is also consistent with the results of the study conducted by Tsay, Kofinas, and Luo (2018) which showed that students in the gamified course had better student performance than students in non-gamified courses.

Recommendations

Although gamification is known to have positive effects on a student's performance and engagement, it is not the only factor. The student's background or demographic may have an influence on their performance as well. That is why for future studies it is recommended to analyze whether the students' background also affects their performance. Furthermore, due to the limitations of the Moodle platform, only a few game elements could be added to the course. Although the researcher tried to add as many game elements as possible aside from points (stars), badges, and leaderboards—such as progress trackers, positive feedback, and group activities—the students still seem to notice the competitive game elements more. This has been shown to negatively affect some students, which is why in future studies it would be best to add other features as well. Adding narrative-based fantasy or storytelling may also help the students be more engaged in the class (Bai, Hew, Gonda, et al. 2022).

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APPENDIX A
Survey for An Empirical Study Evaluating the Effects of Gamification in an E-learning Environment

Survey Part I. Demographic Information					
Name: (Optional)					
Age:					
Gender:			<input type="checkbox"/> Male or <input type="checkbox"/> Female or <input type="checkbox"/> Prefer not to say		
Are you a working student?			<input type="checkbox"/> Yes or <input type="checkbox"/> No		
Where are you based?			<input type="checkbox"/> Local or <input type="checkbox"/> Offshore		
Survey Part II. The Effects of Gamification					
<p>This part of the questionnaire uses a 5-point Likert scale. The questions here are regarding the possible negative and positive effects the gamified course may have had on you.</p>					
Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Agree
Positive Effects of Incorporating Game Elements in MyPortal					
The game elements fueled my interest to compete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements fueled my interest to work hard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements motivated me to succeed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Psychological Effects of Incorporating Game Elements in MyPortal					
The game elements increased my sense of belonging in the virtual classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements reduced the feelings of loneliness I used to feel in an e-learning environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The game elements made me feel more connected to my classmates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me feel more connected to my professor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements reduced the feelings of boredom I used to feel in a course without gamification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements reduced the feelings of anxiety that I used to feel in a course without gamification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me feel more stress-free as compared to a course without gamification because it is associated with the feelings I have when I play games.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements changed my perspective on the negative views of online learning that it is difficult and boring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoyed learning in a course with gamification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cognitive Effects of Incorporating Game Elements in MyPortal					
Learning in a class with gamification increased my feelings of competence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements help me remember my lessons for a longer period of time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements helped improve my concentration while studying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The game elements motivated me to pay attention to any changes in the course that may give me more points	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formation of Good Learning Habits as a Result of Using Game Elements in MyPortal					
The game elements motivated me to do more than I was required to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements motivated me to complete all the course requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements motivated me to participate more in the discussion forums to gain more stars	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was more motivated to interact with my classmates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was more relaxed because I knew that there were tasks that had no deadline, which I could complete any time before the end of the trimester	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was more cautious when taking quizzes or exams because I knew that I only had a certain amount of time to finish it and had only one chance to answer it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I studied harder for exams because I knew that I only had a limited amount of time to finish it and had only one chance to answer it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seeing my grades right after a quiz or exam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

motivated me to do better in the next one.					
Seeing the automatic feedback at the end of the quiz motivated me to do better in the next one.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negative Effects of Incorporating Game Elements in MyPortal					
The game elements created negative feelings between students due to competition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements discouraged students to form strong relationships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements lowered my motivation to complete the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements increased my anxiety while working on the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me more conscious about gaining stars, badges, and other external rewards rather than effectively learning in the class.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Survey Part III. Evaluating the Gamified Course					
This part of the questionnaire uses a 5-point Likert scale. It is mainly a technical evaluation of the gamified course.					
Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
System Quality					
It was easy to use/navigate the course site even with the game elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The course site with game elements made it easier to learn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

There were no technical difficulties when it came to the game elements on the course site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Quality					
The game mechanics were explained clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements added were relevant to the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements and mechanics were easy to follow and understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service Quality					
The game elements added to the course exceeded my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wish that they had added more game elements to the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There were certain game elements that I wanted to change or remove	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Use					
The game elements made me visit the course site more often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me more active in the course site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me more motivated to study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User Satisfaction					
How satisfied were you with the game elements added in the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How satisfied were you with the game mechanics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How satisfied were you with the overall experience of the gamified course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Quality					
It was easy to use/navigate the course site even with the game elements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The course site with game elements made it easier to learn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There were no technical difficulties when it came to the game elements on the course site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information Quality					
The game mechanics were explained clearly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements added were relevant to the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements and mechanics were easy to follow and understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Service Quality					
The game elements added to the course exceeded my expectations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wish that they had added more game elements to the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There were certain game elements that I wanted to change or remove	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
System Use					

The game elements made me visit the course site more often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me more active in the course site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game elements made me more motivated to study	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How frequent would you visit the course site?	<input type="checkbox"/> Once a week	<input type="checkbox"/> 2-3 times a week	<input type="checkbox"/> 4-5 times a week	<input type="checkbox"/> 6-7 times a week	
User Satisfaction					
How satisfied were you with the game elements added in the course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How satisfied were you with the game mechanics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How satisfied were you with the overall experience of the gamified course	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any comments about your experience with the gamified course? Feel free to share any suggestions for future courses as well.					

APPENDIX B Student Consent Form



University of the Philippines Open University
INSTITUTIONAL RESEARCH ETHICS COMMITTEE

Informed Consent Form for the students of MMS 140 2nd Trimester Academic Year 2021-2022

April Felicia C. Fojas

BA in Multimedia Studies

An Empirical Study Evaluating the Effects of Gamification in an E-learning Environment

PART I: INFORMATION SHEET

INTRODUCTION

I am April Felicia C. Fojas, a 4th-year student of the BAMS program. I am inviting you to participate in a study regarding the use of gamification in e-learning environments. Participants of the study will remain anonymous. All personal data collected from this study will be confidential. Only the Faculty-in-Charge (FIC) of MMS 140, Asst. Prof. Cecille Moldez, and I will have access to your data. For further information on the study, kindly continue reading below. If you have any more concerns and questions regarding the study, you may contact your FIC at cecille.moldez@upou.edu.ph.

PURPOSE OF THE RESEARCH

The purpose of this research is to see if gamification improves one's motivation, which may result in better academic performance. Gamification in learning is the use of game elements, such as badges, leaderboards, timers, progress trackers, and such to appeal to one's intrinsic and extrinsic motivation. The results of this study will also determine whether gamification should be used in all courses in the UPOU MyPortal.

TYPE OF RESEARCH INTERVENTION

In the MMS 140 course site, various game elements will be introduced. Progress trackers, checklists, leaderboards, scoreboards, quiz timers, automatic feedback mechanisms, star ratings, and badges are some of the game elements you can expect. You will encounter these game elements throughout the entire duration of the course. Two weeks before your final exam, I will be collecting data through the use of surveys that will be distributed online. The survey will be used to assess the design of the course site as well as the impacts that the gamified course may have had on you.

PARTICIPANT SELECTION

You have been chosen as a possible participant because you have enrolled in the course that the study is being conducted.

VOLUNTARY PARTICIPATION

Participation in this study is purely voluntary. You may choose to participate in this study, and you may also choose not to be a part of it. By choosing to participate in this study you are agreeing to:

1. Participate in the survey questionnaire to be given two weeks before your final exams (which you may answer until the end of the trimester);
2. Have your grade included in the mean computation at the end of the course;

3. Have your activities in the gamified version of the class be recorded and analyzed.

You may choose to opt-out of the study anytime. Please inform your FIC if this is the case and data from the items mentioned will no longer be included in the analysis. Dropping out of the study will not have any negative effect on your grade.

PROCEDURES

As mentioned before, various game elements will be placed on the course site. There are various badges that you can collect when you achieve a certain goal. You will also have the opportunity to rate your classmates' posts in the discussion forums using star ratings. Students with the highest ratings will be acknowledged through leaderboards. The students with the highest exam scores will also be acknowledged in the leaderboards. You will also notice progress trackers and checklists that will help you identify how you are progressing in the class.

Two weeks before your final exam, a survey will be distributed online to the participants who wish to answer it and have signed the consent form. The survey will include questions evaluating the design of the course site and the various game elements used. Questions evaluating your experience with the gamified course site will also be included. This is to see the various positive and negative impacts that the gamified course might have had on you. The information on the survey will be kept confidential, we will not collect any personal information from the surveys, only a number will be assigned to you. No one but your FIC and I will have access to the information.

DURATION

The study will be conducted throughout the trimester, but the survey will only be distributed at the last week of the trimester.

RISKS

Because of the nature of some game elements, there will be the risk of negative feelings due to competition.

BENEFITS

By participating in the study, you will help us understand how effective gamification is in improving motivation. This may benefit future students, teachers, and practitioners in the field of online and distance learning.

REIMBURSEMENTS

Participants of this study will not receive any payments. Likewise, your participation in the study will not give you bonus points in your grade.

CONFIDENTIALITY

Any personal information gathered from the participants will remain confidential. Names will remain anonymous and other personal information will not be shared to the public. Only your FIC and I will have access to your information.

SHARING THE RESULTS

The results of the study will be shared with all the participants. If ever the study is to be publicized for journal articles or in conferences, all personal information will remain confidential.

RIGHT TO REFUSE OR WITHDRAW

Participation in the study is voluntary and you have the right to withdraw. If you would like to review your survey answers, a copy will be sent to you. If you decide that you would like to opt-out of the study, all data involving you will not be included in the study.

DATA MANAGEMENT

All data will be collected online, through the use of Google Suite. Data will be password protected and restricted to only me and the FIC's Gmail accounts. Data will be stored in my GDrive until the thesis is finished. Once the thesis has been finished, all data will be deleted.

WHO TO CONTACT

For any concerns or questions about the study, please contact your FIC, Asst. Prof. Cecille Moldez at cecille.moldez@upou.edu.ph or the UPOU Data Protection Officer at dpo.upou@up.edu.ph.

PART II: CERTIFICATE OF CONSENT

This section is mandatory

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study and I confirm that I am 18 years old or above.

Print Name of Participant: _____

Signature of Participant: _____

Date: [MM/DD/YYYY]

STATEMENT BY THE RESEARCHER OR PERSON TAKING CONSENT

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. The purpose of this study is to see whether gamification improves a students' motivation and academic performance. The study aims to help other students, teachers, and practitioners in online and distance learning environments to understand gamification as well.
2. The results of the study will be shared with all the participants. If ever the study is to be published in journal articles or conferences, all personal data will remain confidential.
3. Any personal information gathered from the participants will remain confidential. Names will remain anonymous and other personal information will only be shared between the MMS 140 FIC and I.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher or person taking the consent April Felicia C. Fojas

Signature of Researcher or person taking the consent

Date: March 16 2022

APPENDIX C FIC Consent Form



University of the Philippines Open University INSTITUTIONAL RESEARCH ETHICS COMMITTEE

Informed Consent Form for the FIC of MMS 140 2nd Trimester Academic Year 2021-2022

April Felicia C. Fojas

BA in Multimedia Studies

An Empirical Study Evaluating the Effects of Gamification in an E-learning Environment

PART I: INFORMATION SHEET

INTRODUCTION

I am April Felicia C. Fojas, a 4th year student of the BAMS program. I am inviting you to participate in a study regarding the use of gamification in e-learning environments. Participants of the study will remain anonymous. All personal data collected from this study will be confidential. Only my thesis adviser, Asst. Prof. Mari Crisanto and I will have access to your data. For further information on the study, kindly continue reading below. If you have any more concerns and questions regarding the study, you may contact me at acfojas@up.edu.ph.

PURPOSE OF THE RESEARCH

The purpose of this research is to see if gamification improves one's motivation, which may result in better academic performance. Gamification in learning is the use of game elements, such as badges, leaderboards, timers, progress trackers, and such to appeal to one's intrinsic and extrinsic motivation. The results of this study will also determine whether gamification should be used in all courses in the UPOU MyPortal.

TYPE OF RESEARCH INTERVENTION

In the MMS 140 course site, various game elements will be introduced. Progress trackers, checklists, leaderboards, scoreboards, quiz timers, automatic feedback mechanisms, star-ratings, and badges are some of the game elements you can expect. These game elements will be applied throughout the entire duration of the course. Two weeks before your students' final exam, I will be collecting data through the use of surveys that will be distributed online. The survey will be used to assess the design of the course site as well as the impacts that the gamified course may have had on them.

PARTICIPANT SELECTION

You have been chosen as a possible participant because you are the Faculty-in-Charge in the course that the study is being conducted in.

VOLUNTARY PARTICIPATION

Participation in this study is purely voluntary. You may choose to participate in this study, and you may also choose not to be a part of it. By choosing to participate in this study you are agreeing to:

1. Alter your course site to include the game elements suggested, but you are also free to suggest game elements that you would like to include;

2. Act as the middle man between me and your students when it comes to addressing the students' concerns;
3. Have regular communication and online meetings with me and my thesis adviser.

You may also volunteer to be a co-author of the study if it is published or presented in the future. Dropping out of the study will not have any consequences.

PROCEDURES

Aside from teaching your class, we will work together to come up with the best game mechanics for your students, which you will have to implement on the course site. We may also have regular meetings, either one-on-one or together with my thesis adviser, Asst. Prof. Mari Crisanto, to discuss how the course is progressing. You may also raise any concerns you have regarding the study during these meetings. We may co-write a paper together with my thesis adviser at the end of the study if you wish to do so.

DURATION

The study will be conducted throughout the AY 2021-22 Second Trimester.

RISKS

There will be the risk of negative feelings, especially when trying to implement the game mechanics and altering the course site since it will take some effort.

BENEFITS

By participating in the study, you will help us understand how effective gamification is in improving motivation. This may benefit future students, teachers, and practitioners in the field of online and distance learning. You will also be recognized as a co-author if you wish to co-write a paper on this study which may be published in a journal or presented at a conference.

REIMBURSEMENTS

Participants of this study will not receive any payments.

CONFIDENTIALITY

Any personal information gathered from the participants will remain confidential. Names will remain anonymous and other personal information will not be shared with the public. Only my thesis adviser and I will have access to your information.

SHARING THE RESULTS

The results of the study will be shared with all the participants and all personal information will remain confidential. Only if you wish to co-write a paper on this will your information be released to the public.

RIGHT TO REFUSE OR WITHDRAW

Participation in the study is voluntary and you have the right to withdraw at any time. If you decide that you would like to opt-out of the study, all data involving you will not be included in the study.

DATA MANAGEMENT

All data will be collected online, through the use of Google Suite. Data will be password protected and restricted to only me and my thesis adviser's Gmail accounts. Data will be stored in my GDrive until the thesis is finished. Once the thesis has been finished, all data will be deleted.

WHO TO CONTACT

For any concerns or questions about the study, please contact me at acfojas@up.edu.ph or my thesis adviser Asst. Prof. Mari Crisanto atmarianjeli.crisanto@upou.edu.ph. You may also contact the UPOU Data Protection Officer at dpo.upou@up.edu.ph.

PART II: CERTIFICATE OF CONSENT

This section is mandatory

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study.

Print Name of Participant: _____

Signature of Participant: _____

Date: [MM/DD/YYYY]

STATEMENT BY THE RESEARCHER OR PERSON TAKING CONSENT

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. The purpose of this study is to see whether gamification improves a students' motivation and academic performance. The study aims to help other students, teachers, and practitioners in online and distance learning environments to understand gamification as well.
2. The results of the study will be shared with all the participants. If ever the study is to be published in journal articles or conferences, all personal data will remain confidential.
3. Any personal information gathered from the participants will remain confidential. Names will remain anonymous and other personal information will only be shared between my thesis adviser and me. Only when you agree to co-write a paper on this study will your information be released.

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this Informed Consent Form has been provided to the participant.

Print Name of Researcher or person taking the consent April Felicia C. Fojas

Signature of Researcher or person taking the consent

Date: March 16, 2022