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University Students Opinions on the Use of Gamification Tools for Academic Evaluation

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Gamification in education is a concept that has gain popularity over the years, with teachers adopting the practice of using gamified elements in courses. Gamification in education involves adding typical game playing elements such as points and leaderboard, into educational activities, in other to make it fun for learners. This study aims to determine the opinions of university students on the use of gamification tools for academic evaluation. The authors obtained the data through interviews, which is regarded as a qualitative data collection method. The data indicates that using gamification tools has a positive impact on students learning process, as it improves their motivation, engagement, and skills. Notwithstanding the positive impacts of gamification in education, this study also draws attention to some potential disadvantages of applying gamification tools to learning, such as distraction and adaptability issues. The purpose of this study is to contribute to greater understanding of how applying gamification to education directly impacts students. Also, the authors hope that this study will help teachers and institutions that are considering adopting this technique of learning, make a right decision for the benefits of the students.

Keywords: gamification; academic evaluation; gamification tools; education.

1. Introduction

Gamification, the practice of incorporating game mechanics or components to motivate and captivate users while they engage in real-world or productive tasks, has become increasingly popular in recent years

[1]. Gamification has gained significant popularity in various domains, including marketing, health, and fitness [2]. Notably, many companies have also adopted gamification to enhance business performance. By utilizing features such as points, badges, and leaderboards, gamification can help companies to achieve various goals, including improving sales, boosting employee motivation, promoting collaboration, and overall business performance [2].

Incorporating gamification into course content and curricula could prove advantageous, as

gamification can potentially address decreased motivation and engagement among learners within the educational system [3]. By making learning activities more enjoyable, gamification can tap into learners' natural curiosity and desire for challenge, encouraging them to take a more active role in their learning. It has led to a growing body of research exploring gamification's effects on motivation and engagement, with many studies reporting positive outcomes. Notwithstanding, while the results of previous studies on students' motivation and engagement by applying the practice of e-learning are encouraging, more research is necessary to completely understand the students' perspectives and opinions on utilizing gamification concepts in classrooms.

There is a need to examine the factors that can potentially influence gamified systems' effectiveness and identify potential complications that may arise.

2. Literature Review

According to the study by Khaldi et al. [4], gamification can positively impact learners' motivation, engagement, and learning outcomes in higher education. However, how effective gamification elements will prove to be depends on the design and implementation of the gamification strategy, as well as the context and characteristics of the learners. Several challenges and limitations to the implementation of gamification in e-learning were identified, such as no empirical evidence of its effectiveness, the potential for extrinsic motivation to overshadow intrinsic motivation, and the need for careful consideration of ethical issues relating to the usage of rewards and incentives. Gamification works best when it is designed to align with learners' intrinsic motivations and when it provides clear goals and feedback. Overall, gamification can enhance e-learning in higher education, but to optimize its advantages while minimizing disadvantages, thorough evaluation, planning, and execution are necessary [5,6].

Kappen et al. [7] conducted a research and found that gamification received positive feedback in the field of education, as both learners and educators showed enthusiasm for intergrating game elements into educational contexts. The study further went on to reveal that gamification has the potential to significantly enhance motivation and engagement among students , while also facilitating important learning outcomes such as knowledge acquisition, retention, and transfer.

A study conducted by Landers and Landers [8] empirically examined the theory of gamified learning. The study seeked to investigate the influence leaderboards has on time spent on tasks and academic performance in courses taken by students. The results showed that using leaderboards increased the time spent on tasks compared to the other group of students. However, there was no huge impact on the academic performance, as seen on quiz grades. In as much as leaderboards can improve motivation and engagement in learning activities, it may not necessarily lead to and improved final leaning outcome. The study emphasizes the significance of meticulous design and implementation of gamified strategies, offering valuable perspectives on how leaderboards can potentially impact the time allocated to tasks and academic peroformance in college-level course.

According to [9] in order to promote student involvement in learning, this study investigates

the use of gamification strategies. A quasi-experimental design was adopted in the study, which included 577 undergraduate students in six classes, three of which served as the treatment group (involved in gamification activities) and three as the control group (used the regular learning method). According to the findings, the treatment group's pupils were much more engaged in their studies than the control group's students. The study reveals that students value participating in gamified learning activities and offers factual evidence for the gamification of education.

Smiderle et al. [10] examined how gamification affects students' learning, engagement, and conduct according to their personality qualities,. 40 undergraduate students who were randomly allocated to either a gamified or non-gamified version of a programming learning environment participated in the study. According to the findings, gamification has varying effects on users depending on their personality types. Gamification can improve learning and boost engagement, but some users may experience ambiguous or unfavorable consequences from it. The amount of points and ranking opinions between the introvert and extrovert students who used the gamified version were significantly different, proving that different users with various personality qualities experience the effects of gamification in different ways. Therefore, the effect of gamification depends on the specific characteristics of users.

Rodríguez et al. [11] suggested a design and assessed three distinct experiences derived from gamification in computer science studies conducted at a Spanish university. The study employed a mixed-methods methodology involving surveys, focus groups, and performance data to gauge the influence of gamification experience on students motivation, engagement, and learning outcomes. The findings revealved that the gamification experiences received favorable responses from the students and had a positive effect on their motivation and engagement levels. More specifically, the incorporation of gamification elements like leaderboards, badges, and points, contributed to the creation of an immersive and competitive learning environment. Additionally, gamification experiences positively impacted student learning outcomes, with students performing better on exams and assignments when the gamification elements were present. While the implementation of gamification in higher education is becoming increasingly important, there is still a need for more research to determine the most effective design and implementation strategies for these experiences. Overall, the study suggests that gamification can effectively enhance student motivation, engagement, and learning outcomes in computer science studies.

A study carried out by [3], discovered that a gap exists between theory and practice when it comes to the study of gamification. The researcher wrote about competence and its role in motivation to prevail over challenges, eventually leading to success. Additionally, the study shed light on how gamification can serve as a partial remedy for the decreasing motivation of learners in colleges. Over the years, a connection between video game elements and motivation has been established among researchers. In a gamified environment, when a player is engaged, they become willing to root themselves in virtual challenges to achieve fun, compete, and play. Humans become motivated when perceiving an interesting event, performing without conditioning other than mere pleasure.

An article by Dicheva et al. [2] proposed a course gamification platform to support teachers to gamify various courses targeted towards skill development (for example, computing-related

courses). The researchers' goals were to develop a prototype gamification platform to faciliate their study, to see the effect of applying gamification to course materials, and to generate concrete data on the suitability and effectiveness of using game mechanics to enhance student motivation and involvement.

Poondej and Lerdpornkulrat [9] collected data from 104 enrolled in a course and interaction data of students from Moodle to determine if there is a disparity in the frequency of online interaction among students who performed above average and those who performed below average. The findings proved that there was satisfaction with gamification tools in Moodle, as students were engaged in the gamification course. The researchers also found a variation in the frequency of online course interaction between the above-average performing group and the below-average performing group.

According to [12], the past years have presented a heightened difficulty in educational experiences as remote teaching has become the norm. So in order to sustain student engagement, educational strategies that align with modern technology have become essential. The authors stated that gamification is one such methodology that has gained popularity in schools due to the pandemic, and its effect on student motivation and involvement requires investigation. The study indicated that this approach could enhance student participation, and teachers can provide additional support to facilitate the process. The study proposes developing a gamification strategy that can be easily replicated in other settings.

3. Materials and Methods

Qualitative research's primary goal is to explore and gain insight into the human experience and social environments by examining questions related to their meaning and dimensions [13]. A key factor in conducting effective qualitative research is to shed light on the participants' subjective meanings, actions, and social contexts as they perceive them. The researchers utilized a qualitative approach in this study to uncover the authentic and meaningful viewpoints of the students.

In this study, a qualitative method was used to reveal the students' significant and real opinions over the use of gamification as a grading system in education. A total of 12 results were obtained, but only 11 responses were found to have answered the questions extensively. This group of students are currently taking a gamification course, and the authors believe they have used gamification elements at some point in their lives. The researchers created a semi-structured interview format to gather students' perspectives regarding gamification application in education. The interview questions focused on several areas, including the influence of gamification on student motivation and the learning process and identifying any deficiencies or negative aspects of gamification application. All the participants volunteered to participate in this study.

The authors established the content validity of the interview questions through a literature review. The researchers also consulted an expert in other to ensure that the questions to be asked were clear and suitable for the respondents. The researchers made necessary adjustments to the questions based on the feedback gotten from the expert. The responses were properly written down, grouped, and documented to avoid data loss and misstatement. This study aimed

to obtain answers to the following questions in other to achieve the objectives of the study:

- Have you ever participated in any gamified activities in your learning process? If yes, what application did you use? Also, could you describe how it was and how it affected your motivation to learn?
- How do you think gamification can help you learn better? Furthermore, what do you think are the advantages of gamification in education?
- Are there any potential drawbacks or negative aspects of gamification in education for evaluation and motivation that concern you?
- Do you think gamification would work better for certain courses compared to others? If so, which ones and why?
- Do you think gamification could replace traditional grading systems? If yes, explain why and how?

4. Results

In other to understand if the students have an idea about gamification, the research question was asked

RQ1a: Have you ever participated in any gamified activities in your learning process?

RQ1b: If yes, what application did you use? Also, could you describe how it was and

RQ1c: How it affected your motivation to learn

Six respondents agreed to be involved in a gamified activity before, while five did not. Gamified applications used by the respondents are Coursera, Duolingo, Sololearn, Udemy, Edpuzzle, quizlet, and Kahoot. 6 key points were derived from how gamified activities affected their learning motivation. “Highly motivated”, “improved language skills”, “made learning interesting and lively”, “made learning more engaging, entertaining, and understandable”, “rewards motivated continues learning”, and “Motivated because it is free”.

According to Table 1, most respondents have used the Duolingo application to learn a language.

Table 1: RQ1b

Application used	f	Percentage
Courser	2	33.33%
Duolingo	4	66.67%
Sololearn	1	16.67%
Udemy	1	16.67%
Edpuzzle	1	16.67%
Quizlet	2	33.33%
Kahoot	2	33.33%

The Majority of the respondents emphasized how using gamified processes to learn has made learning more engaging, entertaining and understandable.

Table 2: RQ1b

opinions	f	Percentage
Highly motivated	2	33.33%
Improved language skills	2	33.33%
Made learning interesting and lively	1	16.67%
Made learning more engaging, entertaining, and understandable	5	83.33%
Rewards motivated continued learning	2	33.33%
Motivated because its free	2	33.33%

Students' opinions regarding the gamified application they have used and how it affected their motivation to learn

"Yes I have participated in a gamified activity. I have used the following applications: duolingo, sololearn, udemy, coursera, Edpuzzle, Quizlet

Using this applications helped me understand the course better and I was more engaged throughout the learning process. I was not bored while learning" (Respondent 4)

"I have participated in a number of gamified activities. In my undergrad, one of my instructors used a gamified approach to teaching an introduction to programming course. Also I have used web applications like coursera which has some sought of gamified activities attached to their courses.

In my freshman undergraduate computer science class, points were assigned to students who were able to solve computing problems within a given timeframe. This made me highly motivated, pushing me to go learn new coding habits on youtube, and codeacademy, just so I can be faster that my colleagues in finding solution to coding problems. It also made the class more interesting and lively. Also, the way cousera courses are structured, makes it more interesting for students to want to complete the course" (Respondent 1).

Advantages of Gamification in education

In other to understand the students' perspective about how gamification can help them learn better and what are the advantages of gamification the following research question were asked. RQ2a: How do you think gamification can help you learn better?

RQ2b: And what do you think are the advantages of gamification in education?

For the question, "how do you think gamification can help you learn better?" students opinion were vast and it includes increasing collaborative learning, it help to learn more effectively, fast assimilation. 5 key points were derived from how they think gamification can help them learn better. "Increase collaborative learning", "increase motivation", "promotes active learning and makes learning more fun", "retention of information", "points and badges encourages to learn new things". The frequency at which each point was mention is represented in table 3

Table 3: RQ2a

opinions	f	Percentage
Increase collaborative learning	4	36.36%
Increase motivation	4	36.36%
Promotes active learning and makes learning more fun	5	45.45%
Retention of information	2	18.18%
Points and badges encourage to learn new things	2	18.18%

“gamification can help me learn better by increasing motivation, engagement, and interactivity” (Respondent 8).

“Gamification can help learn better because it stimulates fast assimilation. It is easier to recall what have been learnt during the class, it helps to get engaged during the class activities, it makes the lecture more fun” (Respondent 4).

Based on the respondents opinion in answering question RQ2b, respondents opinion about what they think are the advantages of gamification in education includes: provides teachers information about students’ performance and progress, saves lecturers time of prolonged explanation, immediate feedback, improves students overall performance, it boost students confidence. As shown in table 4, Majority of the respondents believe that one of the advantages of gamification in education is increased students engagement and active learning.

Table 4: RQ2b

opinions	f	Percentage
Increase students engagement and active learning	8	72.73%
Improve collaborative learning	4	36.36%
Increase motivation	3	27.27%
Retention of information	3	27.27%
Personalized and adaptive learning	2	18.18%

“The advantages of gamification in education include increased engagement, retention, and achievement, as well as the development of critical thinking, problem-solving, and collaboration skills” (Respondent 11).

Potential drawbacks of gamification in education for evaluation and motivation that concern you?

One of the aim of this research is to determine if the respondents think there are any negative aspects of using gamification approach in education for evaluation and motivation purposes. Therefore the research question was asked: “Are there any potential drawbacks or negative aspects of gamification in education for evaluation and motivation that concern you?” All the 11 respondents agreed that there are potential drawbacks of gamification in education for evaluation and motivation. There was no conflicting opinion.

From the respondent opinion they believe using gamification for evaluation and moltivation purpose in education may result in disagreement and disunity in class, lack of motivation, addiction and misuse. 5 phases were formulated based on the responses. “Distraction”, “adaptability issue”, “limited applicability”, “Creates competitive or stressful environment”, “Focus of rewards (Extrinsic over intrinsic motivation)”. As shown in table 5, students focus

more on the reward rather than understanding the actual aim of the course. That is, using gamification for evaluation and motivation purpose in education can result to students being extrinsic motivated rather than being intrinsic motivated.

Table 5: RQ3

opinions	f	Percentage
Distracttion	4	36.36%
Adaptability issue	4	36.36%
Limited applicability	5	45.45%
Creates competitive or stressful environment	3	27.27%
Focus of rewards (Extrinsic over intrinsic motivation)	6	54.54%

Respondents' opinion about the possible potential drawbacks of gamification in education for evaluation and motivation:

"Although gamification has numerous advantages, it is not a panacea, and there are potential drawbacks and risks to consider. Gamification, for example, can occasionally result in extrinsic motivation, in which learners are more focused on the incentives than on the learning itself. Furthermore, gamification may not be appropriate for all learners or topics, and its effective implementation may necessitate significant resources and planning. Furthermore, there is a danger of creating an overly competitive or stressful environment, which can impair learning and well-being" (Respondent 3).

"Yes, the focus on game mechanics and rewards may shift students' attention away from learning for its own sake and instead encourage them to focus solely on earning points or badges" (Respondent 1).

Courses that work better with gamification

In order to determine the respondents perspective about the courses that work better with gamification the research question was asked: "Do you think gamification would work better for certain courses compared to others? If so, which ones and why?"

10 respondents agreed that gamification works better for certain courses compared to others, while 1 respondent believe otherwise.

"No, I think gamification will have the same impact on all courses" (Respondent 5)

Here are some of the reasons why respondents think gamification cannot work for all courses:

Gamifications can work for courses that "are complex to comprehend", "requires logical reasoning and practice skills"

Gamifications may not work for courses that "are theoretical or abstract disciplines", "requires critical thinking and analysis".

"Yes I totally agree. Some computer science courses can get a bit complex to comprehend without the help of gamification. This is because such courses requires logical reasoning (just like actual games people play), so gamifying the activity may help students performance. Whereas, courses that do not require logical reasoning (such as history, culture), may not require the concept of gamification, as those courses are already interesting, captivating, and

engaging" (Respondent 1)

"Yes, gamification may work better for some courses compared to others and this depend on the nature of the subject matter and the learning goal.

For example, it might work well for courses that require skill-based learning or decision-making, like language learning or coding, as game-like elements can provide learners a way to practice and apply their skills in real life scenarios. But gamification might be less effective for courses like history or literature because it needs more memorization" (Respondent 7).

"Yes, I think gamification may work better for some courses than others, depending on several factors such as course topic, target audience, and learning goals. Taking the case of math: gamification can be used to make math learning more interactive and fun using math challenges, math puzzles, logic games, etc. In sum, gamification can be used successfully in a variety of courses, but it is important to consider the specific characteristics of the course and the students to choose the most appropriate and effective gamification elements" (Respondent 6).

"Gamification may work better for certain courses that require more memorization and repetition, such as language learning, math, or science. However, it may be less effective for courses that require critical thinking, analysis, and creativity, such as philosophy, literature, or art"

According to the respondents has represented on table 6, gamification would work better for courses like maths, language study, science, and vocational training.

Table 6: Courses that work better with gamificaton

opinions	f	Percentage
Maths	5	50%
Language study	6	60%
Science	5	50%
Vocational training	3	30%

Gamification over traditional grading systems

The study aim to determine if gamification can replace the traditional grading systems. The respondents were asked the following question: "Do you think gamification could replace traditional grading systems? If yes, explain why and how?"

All the respondents opined that gamification cannot replace the traditional grading system.

Respondent 11 believes that gamification cannot replace traditiona grading systems because are much needed to access learners knowledge and skills.

"Gamification cannot replace traditional grading systems entirely, but it can complement them by providing alternative forms of evaluation and feedback. For example, gamification can use points, badges, and levels to track learners' progress and provide immediate feedback on their performance. However, traditional grading systems are still needed to assess learners' knowledge and skills accurately" (Respondent 11).

Respondent 1 believes that it is essential to grade students since it provides the teacher with an in-depth assessment of their academic development and capability.

"In my opinion, gamification is a powerful tool, but I do not think it has the potential to replace traditional grading systems, because grading students is a necessity as it gives the teacher a comprehensive feedback of students' academic progress and ability. Whereas gamification just gives an immediate feedback and progress tracking. Also, gamification is just used to reinforce learning, and does not accurately and directly measure if the student has mastered, and completely understood that course" (Respondent 1).

Respondent 4 believes that while traditional grading methods help to put the students' knowledge to the test and determine if the course's overall concept is understood or not, gamification can merely assist students in earning badges and other points in the classroom.

"Gamification cannot replace the traditional grading systems because, gamification can only help students to earn badges and other points in the class room but the traditional grading systems helps to put the students knowledge to test if the overall concept of the course is understood or not. Traditional grading systems serve as a measure of student achievement and provide a quantitative representation of their performance in a particular subject or course"(Respondent 4)

4. Discussion

After the covid-19 pandemic, there have been an emergence of various methods in which education can be delivered to students. For instance virtual learning, whereby course contents can be administered to students online via video or audio. This comes with tremendous challenges such as lack of motivation and engagement, which can eventually lead to high rate of dropouts.

Students who participated in the interview were familiar with the concept of gamification, pointing out some gamified application such as Coursera, Duolingo, Udemy, and quizlet, which they have used in the past to learn. Majority of the students wrote in favor of gamification promoting active learning, therefore making learning more fun. The responses gotten from the interview also demonstrated that applying gamified elements to education increases students' engagement, motivation to learn, and collaborative learning. Although some of the students highlighted that there are courses that works better with gamification (such as maths, and vocational trainings), gamification can improve the overall learning process.

In Hursen and Bas [14] research which involved 16 students, found out that there was a significant different in pre-test and post test scores of students. The results gotten from that experiment shows that students consistently exhibit a willingness to engage in science education. The student's motivation for conducting research, communicating, and participating in group studies demonstrated a positive increase following the experiment. The findings of the study indicated that gamification applications generally have a beneficial impact on enhancing students' motivation to learn science. This result is in line with the findings of our study, which shows that some courses may work better with gamification.

Barna and Fodor [15] after using gamification environment within Moodle e-learning platform in IT course with over 2500 enrolled students, in other to evaluate the effectiveness of gamification platform, showed a result indicating that gamification has the potential to

enhance the quality of IT courses. But however, it may not address all the potential challenges that can arise during such courses. In parallel with this results, it was found in this study that there are potential drawbacks that comes with gamification, such as distraction and adaptability issues. Some students may find it difficult to succeed in such courses, as they are not used to this new system of learning.

A study was carried out by Hanus and Fox [16] to assess the effects of gamification in a college classroom setting. The study involved two groups of students who were enrolled in the same course but were taught using different methods – the first group received traditional lecture-based instruction, and the second group received gamified instruction that involved game elements such as points, badges, and leaderboards. The study found that the gamification intervention had a beneficial impact on students' inherent motivation, satisfaction, and social comparison. Specifically, the gamified group reported higher levels of underlying motivation and satisfaction with the course than the non-gamified group of students. Also, the gamified group showed high levels of social comparison, which may have contributed to increased motivation. Interestingly, the study found no significant differences in academic performance between the two groups, suggesting that gamification did not directly impact students' grades. Notwithstanding, the authors pointed out that the findings may be as a result of measuring academic performance using midterm exams, due to the relative short duration of the study. Also, the authors stated that although gamification can be a good tool in increasing students motivation in a classroom setting, further investigation is needed to fully understand its impact on academic performance.

This study has some limitations and the most important one is that it only took into consideration the opinions of university students. Further study may involve the feedback provided by teachers, and high school students, or follow observation-based path. Another limitation is that the study was carried out at one particular school. Other studies may be conducted to seek the opinions of students from various schools, which may result in a more in-depth understanding of how the concepts of gamification are being applied.

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