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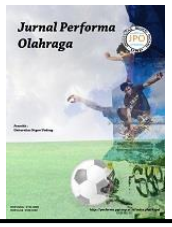

GAMIFICATION IN PHYSICAL EDUCATION LEARNING: A STRATEGY TO INCREASE STUDENT PARTICIPATION AT UNIVERSITAS TERBUKA

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ABSTRACT

This study seeks to evaluate how gamification affects student motivation, engagement, and learning in an online Physical Education course at Universitas Terbuka. A sample of 40 out of 240 students enrolled in the 4th semester of the program was drawn using purposive sampling. The participants responded to a 12-item acknowledgment scale measuring four aspects of gamification: motivational aspects of games, participation and engagement, skills, and overall learning experiences. Based on the analysis of the data collected, findings point out that gamification positively affects student motivation and participation. A significant number of students (92.5%) agreed that new activities based on games made learning processes more enjoyable, and 90% of students said that gamification lessened the boredom encountered in online learning. Although underperforming students were able to increase their understanding of theoretical concepts taught in class, there was a lack of improvement in the performance of some students who were active in independent physical skill practice with only 75% agreeing that the tasks fostered the development of independent physical skills. Most of the students supported the continuation of gamification in the Physical Education course and 95% wanted the inclusion of more game-oriented learning in future lessons. The results indicate that although gamification increases motivation and participation, other strategies are needed to develop practical skills in the context of online Physical Education classes.

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INTRODUCTION

The development of digital technologies over the past few years has notably impacted both instructional practices and learning experiences, particularly concerning open and distance education systems like Universitas Terbuka. Alsharif (2022); McHaney (2023); Nzala (2021)'s study stated the primary characteristics of online education: its convenience, availability, and flexibility make it an attractive option, especially for multi-tasking learners who are in remote locations and are trying to balance education with personal and professional obligations. Even with its many advantages, transitioning to a digital platform does pose some challenges. Perhaps one of the more enduring problems associated with distance learning is low student engagement and participation, especially acute when dealing with subjects that are predominantly practice-oriented, such as Physical education (Elsayed et al., 2024; Howard-Hamilton et al., 2023; Kong et al., 2024). Practical subjects like Physical education, in contrast to theoretical ones, require active participation, instant feedback, interaction with peers, and demonstration by an instructor which are almost impossible to provide in asynchronous teaching and learning settings. As a result, many learners undertaking Physical education programs at Universitas Terbuka struggle with engagement, demotivation, social disconnection, and ultimately reduced outcomes and

skill acquisition. Addressing this particular issue, gamification presents a promising solution as a teaching and learning strategy. The term gamification refers to the incorporation of certain game design elements like points, badges, challenges, leaderboards, and rewards into non-game contexts, aiming to improve user engagement, motivation, and enjoyment within the context of learning by using game psychology (Chou, 2019; Saleem et al., 2022; Zichermann & Cunningham, 2011).

The conception of gamification sits within personal motivation of readiness theory or self-determination (SDT) which states people are more inclined to participate in activities that fulfill one of three psychological needs (Chen & Zhao, 2022; Karra et al., 2019; Tyack & Mekler, 2024): autonomy (sense of control over action), relatedness (having a sense of connection with others), and competence (feeling able and effective). When learners' needs are met, they function, and learners become intrinsically motivated which results to effective engagement and enhanced learning. Gamification gives many of these needs, it can enhance autonomy through customizable goals and paths, competence through feedback and achievement systems, and relatedness through collaboration or competition of the game elements (Christopoulos & Mystakidis, 2023; Dichev et al., 2015; Sailer et al., 2017). In Physical Education, where motivation and regular attendance are especially critical in learning a skill and changing behavior, gamification has the ability to change passive online learning into an active and purposeful endeavor. In spite of the popularity of incorporating gamification into various subjects, its adoption in the pedagogy of Physical Education—especially in an open and distance institution like Universitas Terbuka—is rather behind. Most existing studies on educational gamification have concentrated on the primary or secondary classroom, theoretical subjects, or completely asynchronous online courses.

It is apparent that few empirical studies have been conducted on how gamification can be tailored to assist learners in asynchronous, remote settings, where students may have limited access to facilities, social interaction, or feedback. This research intends to fill that void by examining how gamification can be applied to enhance participation in the Physical education courses offered at Universitas Terbuka. The study is not only concerned with the design and execution of learning activities based on the principles of gamification intended for distance education, but also evaluating the level of impact these activities will have on students' motivations, engagement, and performance. Thus, this research seeks to advance the debate and policy on two fronts. It contributes to the growing discourse on non-conventional learning environments by describing pedagogical approaches arising from non-discipline centered educational environments and providing practical instructional design solutions that make Physical Education more participatory and active, even in the absence of the direct physical interaction that the subject normally necessitates. The fusion of gamification tailored to the lived experiences of Universitas Terbuka's students underscores a distinctive approach to educational innovation and equity: the focus on effective and inclusive distance learning for movement education disciplines.

METHOD

This study used a descriptive survey approach (I. Jones, 2022; Skinner et al., 2024; Thomas et al., 2023) to assess the impact of gamification on student participation in Physical Education courses offered via online learning at Universitas Terbuka. This approach was selected because it enables the researcher to portray the phenomena as they are in the field without any manipulation of the variables. In this particular research case, the descriptive survey approach works best for capturing students' responses and levels of engagement and overall perception toward gamified learning activities executed in a virtual asynchronous learning environment. The population of this research included all fourth semester students undertaking the Physical education program at Universitas Terbuka in the 2024/2025 academic year. A sample of 40 students was drawn from purposive sampling, which was deemed appropriate for having the distinct traits necessary for this study: access to the online learning platform (TUTON), having completed at least one Physical education course online, and being willing to participate voluntarily. This study was designed with a small sample size in mind in order to simplify focused data collection and analysis while still representing a group that has experienced the conditions that were the subject of the study.

The analysis was done in a number of sequential procedures. The first step involved the creation of a structured questionnaire that served as the primary instrument of the research. In developing the questionnaire, the researcher's fundamental elements were focus on gamification in learning: student motivation, participation, achievement of appropriate skills, and overall experience during learning. To eliminate ambiguities and ensure validity accuracy, the expert opinion of three reviewers, two from educational technology and one Physical education lecturer, was sought. After validation, the questionnaire was made available to the chosen students through two online platforms – the official LMS of Universitas Terbuka and the WhatsApp groups for Physical education students – to boost availability and response rates. The survey was available for completion over a period of two weeks. Responses to the questionnaire were received on an anonymous basis. Once all responses were received, data were compiled and analyzed through the application of descriptive statistical techniques - mean, frequency, and percentage - to discern patterns and trends regarding student perceptions, experiences, and expectations.

Throughout the entire process of conducting the research, ethical issues were taken into account. Students were briefed on the objectives of the study. They were also made aware that their participation was voluntary and there would be no negative consequences for opting not to partake in the study. Pseudonymity and confidentiality were guaranteed at all times. Permission was acquired digitally prior to administering the questionnaires. The questionnaire used contained 12 questions which measured four dimensions: motivation through gamification, participation and engagement, skill development and feedback, and overall learning experience. Each of the items was scored using a 5-point Likert scale ranging from 1 'strongly disagree' to 5 'strongly agree' so that all respondents were able to voice their opinion. The table below provides a summary of the items included in the questionnaire organized by dimension:

Table 1. Questionnaire

Dimension	Item Code	Statement
1. Motivation Through Gamification	M1	I feel more motivated to complete assignments when they include game-like elements (e.g., points, rewards).
	M2	Gamified activities make learning Physical education more enjoyable.
	M3	The presence of leaderboards or rankings motivates me to do better.
2. Participation and Engagement	P1	I participate more actively in online discussions when there are challenges or games involved.
	P2	I complete more tasks when they are designed in a competitive or game-based format.
	P3	Gamification helps reduce boredom in online learning.
3. Skill Development and Feedback	S1	Gamified tasks help me better understand physical education concepts.
	S2	I receive useful feedback through the gamified components of the course.
	S3	Gamification helps me practice physical skills independently.
4. Overall Learning Experience	E1	I would like gamification to be used more in future Physical education courses.
	E2	Gamification improves my overall learning experience at Indonesia Open Universtity.
	E3	I would recommend gamified Physical education learning to other students.

Remarks M: Motivatioan dimension
P: Participation and engagement dimension
S: Skill development and feedback dimension
E: Overall learning experience dimension

Each dimension was designed to explore different aspects of how gamification might influence student learning behaviors. The motivation dimension captured emotional and behavioral responses to game elements like points, badges, or rankings. The participation and engagement dimension examined how gamified structures impact students' willingness to interact and complete online tasks. The skill development and feedback dimension measured whether game-based tasks helped students understand and apply Physical education content, even in the absence of physical classroom settings. Lastly, the overall learning experience dimension evaluated students' general satisfaction and openness to continued use of gamification in future courses.

RESULT AND DISCUSSIONS

The results of this study show that the 40 respondents from the fourth semester Physical education program at Universitas Terbuka showed a mostly positive appreciation regarding the implementation of gamification in their online Physical Education courses. Their responses were captured using a 12-item questionnaire that assessed four relevant aspects of gamification: motivation, participation and engagement, skill acquisition, and the learning experience. The descriptive information calculated for the dataset, which included average scores and agreement percentage (proportion of respondents with selected agreement), indicated that the use of gamification in the courses significantly enhanced learner engagement and motivation.

The motivation through gamification dimension indicated that students' motivation to engage with the course content was significantly increased due to gamification. Item M2 ("Gamified activities make learning Physical education more enjoyable") had the highest mean score of 4.5 with 92.5% student agreement. This

indicates that students appreciated the motivational aspects of gamification in a positive way. In the same way, item M1 (“I feel more motivated to complete assignments when they include game-like elements”) had a mean score of 4.3 with 87.5% agreement, which indicates that game elements like points, badges, and other rewards prompted students to finish their assignments. Item M3 (“The presence of leaderboards or rankings motivates me to do better”) had a slightly lower score of 4.1 and 85.0% agreement. This demonstrates that while many students were motivated by the presence of leaderboards, they were less effective than some other gaming elements on a more global scale.

The dimension of participation and engagement also provided strong evidence to support gamification impact. Item P3 ("Gamification helps reduce boredom in online learning") received a mean score of 4.4, with 90.0% of students agreeing that gamified activities lessened boredom, which is a significant problem in online learning environments. Item P1 (“I participate more actively in discussions when there are challenges or games involved”) scored 4.2 with 82.5% agreeing. This suggests that where challenges and games were included, there was greater participation in online discussions. However, P2 ("I complete more tasks when they are designed in a competitive or game-based format") had a mean score of 4.0 and 80.0% agreement. This meant that although the game-based and competitive formats enhanced the completion of tasks, there was still considerable variability in how students responded to these formats.

In the dimension of skill development and feedback, the results were somewhat more varied. Most students completed the survey, and in particular, a high percentage agreed that experiencing a gamified approach facilitated their understanding of Physical education concepts, reflected by item S1 (“Gamified tasks help me better understand physical education concepts”), which had a mean score of 4.3 and 87.5% agreement. However, item S3 (“Gamification helps me practice physical skills independently”) scored somewhat lower at 3.9 with 75.0% agreement. This implies that while students appreciated gamified learning tasks, they believed that these components did not sufficiently aid in the mastering of practical physical skills. Perhaps the explanation for this lies in the nature of online learning where there is little physical interaction with the instructor. Item S2 “I receive useful feedback through the gamified components of the course” scored 4.0, with 80.0% agreement, which indicates that although feedback in general was deemed as useful, more refined detail might be needed in answering students’ performance descriptors.

Finally, the last dimension captured the learners’ perceptions, which was the overall learning experience capture the most positive sentiment from students. For example, Item E1 “I would like gamification to be used more in future Physical education courses” had the highest mean score of 95.0% and mean score of 4.6 which indicates overwhelming agreement towards the use of gamification in further courses. This was also reflected in Item E3 ‘I would recommend gamified Physical education learning to other students’ which had a mean score of 4.5 and 92.5% agreement highlighting that students did not only appreciate the gamification but were willing to recommend it to other learners. Also, Item E2 ‘Gamification improves my overall learning experience at UT’ received a mean score of 4.4 and 90.0% agreement underlined the positive perception of the impact of gamification on student's learning experience.

In general, the findings suggest that gamification positively enhances motivation, participation, and overall learning experience in an online Physical education context. academically, however, the skill development dimension showed that while gamification aids in the conceptual understanding of a topic, in its application to a virtual setting, it has limited effectiveness in developing practical physical skills. The table below displays the mean scores and percentage agreement for each of the items in the questionnaire.

Table 2. Mean Scores of Student Responses (N = 40)

Dimension	Item Code	Statement	Mean Score	% Agreement (Agree + Strongly Agree)
Motivation Through Gamification	M1	I feel more motivated to complete assignments when they include game-like elements.	4.3	87.5%
	M2	Gamified activities make learning Physical education more enjoyable.	4.5	92.5%
	M3	The presence of leaderboards or rankings motivates me to do better.	4.1	85.0%
Participation and Engagement	P1	I participate more actively in discussions when there are challenges or games involved.	4.2	82.5%
	P2	I complete more tasks when they are designed in a competitive or game-based format.	4.0	80.0%
	P3	Gamification helps reduce boredom in	4.4	90.0%

		online learning.		
Skill Development and Feedback	S1	Gamified tasks help me better understand physical education concepts.	4.3	87.5%
	S2	I receive useful feedback through the gamified components of the course.	4.0	80.0%
	S3	Gamification helps me practice physical skills independently.	3.9	75.0%
Overall Learning Experience	E1	I would like gamification to be used more in future Physical education courses.	4.6	95.0%
	E2	Gamification improves my overall learning experience at UT.	4.4	90.0%
	E3	I would recommend gamified Physical education learning to other students.	4.5	92.5%

These results emphasize the effectiveness of gamification in improving student participation and learning outcomes in online Physical Education courses at Universitas Terbuka. Nonetheless, difficulties still arise, especially with regard to the practical and physical skill development components of the gamified tasks. This calls for further investigation into the integration of these gamified features and the more active teaching methodologies of distance education.

Discussions

The findings from this study offer important information on the effects of gamification on student motivation, participation, and the learning experience within an online Physical education course at Universitas Terbuka. In general, these results confirm the benefits of gamification in increasing student engagement and motivation, while also noting some shortcomings in developing physical skills in an online learning context. In this part, we will analyze the advantages and disadvantages of the findings considering other studies.

This study illustrates one of the most compelling benefits of gamification to be the increase of student motivation. The results indicated that 92.5% of students are in agreement with the statement that gamified activities are helpful in making learning enjoyable, with an average score of 4.5 for item M2 (“Gamified activities make learning Physical education more enjoyable”). This is corroborated by other studies that have shown the motivating effect of gamification in education. For instances, Rahayu et al. (2022) stressed that reward elements in a game like points and levels lead to greater achievement and engagement which is very important to sustain students’ interest in online learning. The high agreement percentages with regard to gamified elements like points, rewards, and leaderboards also back M. Jones et al. (2023) who asserted that gamification can enhance motivation and participation, especially in difficult subjects that students tend to lose interest in, significantly.

The research further revealed that the use of gamification techniques heightened student active participation. In the case of item P3, which states, 'Gamification helps reduce boredom in online learning', there was an average score of 4.4 which meant 90 out of 100 respondents agreed with the statement. This indicates that students were not more bored during gamified activities. This is in alignment with Kim et al. (2022) who argues that the application of gamification increases learner participation level because the learning is more enjoyable and hands-on. Furthermore, the findings substantiate Yang et al. (2024) who claimed that elements of gamification enhance the feeling of presence and active participation in a class, particularly in distance education where learners might feel the most alienated.

Another one of the strengths of this study is the perception students have about the relevance of learning when they are gamified was positively shifted. In regards to item E1, ‘I would like gamification to be used more in future Physical education courses’ the average score was 4.6 which indicates that students would want interdisciplinary skills sharpened through gamification in future courses. Their 95 out of 100 respondents agreeing supports Kapp (2013) that gamified learning experiences are often regarded as captivating by learners particularly when they witness an increase in motivation and engagement.

While gamification positively impacts motivation and engagement, this study also notes some issues, particularly concerning the cultivation of practical skills. In this study, the respondents agreed that gamification helped students comprehend Physical education concepts (mean score of 4.3 for item S1), but it was not as effective in aiding students to cultivate practical physical skills without assistance. The mean score of 3.9 for item S3 ("Gamification helps me practice physical skills independently") suggests that students did not consider the gamified activities as adequate for developing hands-on physical skills that need to be mastered. Xu et al. (2022) highlighted this in prior research, contending that “theoretical learning can be fostered through gamification, but subjects with a requirement for physical practice and experiential learning fall short.” In

Physical education's context, where physical activity is integral, it seems that gamification cannot substitute the need for direct instructor interaction, which is essential for physical education classes.

Another possible limitation is that although engagement was improved with gamifcation, some students still had difficulty with the competitive elements of gamified activities. For instance, item M3 ("The presence of leaderboards or rankings motivates me to do better") received a score of 4.1, which, while favorable, was below the other items in the motivational component. This indicates that the motivational features of gamification, especially in relation to competition and ranking systems, may not be equally effective for all learners. As H. Yang & Li (2021) explain, competition in gamified contexts is not always beneficial and can lead to stress or anxiety for some learners, particularly those who lack confidence in their skills or feel discouraged by the hierarchical nature of the rankings. The study by Parks (2023) also argued that while some students thrive in competitive settings, others feel disengaged or demotivated, indicating the need for balance between competition and collaborative or self-paced activities.

Finally, even though the students perceived usefulness of feedback through gamified elements, the score of 4.0 for item S2 ("I receive useful feedback through the gamified components of the course") indicates that more attention could be taken to improve the depth and the quality of feedback provided. Feedback, in the broadest sense, is vital to learning, and as Brown (2021), "feedback is one of the most powerful influences on learning and achievement". In terms of gamification, the ability to tailor feedback more appropriately could greatly improve Physical education students' ability to translate what they learn into practice, especially where skill acquisition is concerned.

CONCLUSSION

The overall results of this study alongside the existing literature on gamification support the notion that the incorporation of game elements increases student motivation, participation, and satisfaction with the learning process. Nonetheless, the practical shortcomings of skill development, especially within the context of Physical Education, indicates that at least in Physical education blended approaches, a more sophisticated framework is needed to meet the requirement of active student engagement. Further research might look into hybrid models of gamification where online instruction is paired with more hands-on practical application environments, or how diverse forms of feedback can be designed to enhance task performance in a way that aids skill development. Also, consideration needs to be given to the level of competitiveness and cooperativeness that is embedded within the gamified activities so that all students can derive positive experiences from gamification without undue stress or withdrawal from the activities.

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