THE PROGRESS: A Journal of Multidisciplinary Studies
Vol.6, No.2 (June, 2025), Pp.149-163
ISSN (Online): 2958-292X, ISSN (Print): 2958-2911
DOI: https://doi.org/10.71016/tp/16g7qy47

Original Article **https://hnpublisher.com**

Examining the Effectiveness of Gamification in Strengthening Active Participation and Learning Outcomes of Students in Higher Education Institutions of Pakistan

Hafsa Khan[1], Ghulam Safdar[2]

[1]MPhil Scholar, Department of Media & Communication Studies, Rawalpindi Women University, Pakistan.
[2]Assistant Professor, Department of Media & Communication Studies, Rawalpindi Women University, Pakistan.
Correspondence: safdarsting@gmail.com[2]

ABSTRACT

Aim of the Study: The purpose of the study was to analyze the effect of gamification in strengthening active participation and learning outcomes of students enrolled in Higher Education Institutions of Pakistan. The research paper deeply focused on the motivation, interest, attendance, knowledge acquisition, skill development and attitude change of individuals because of gamification.

Methodology: In order to execute the objectives, quantitative methodology was used and conducted survey from students of higher education institutions of Pakistan. Random stratified sampling technique was adopted. 264 individuals filled the survey.

Findings: Results of the research showed that gamification during classroom learning is quite effective in increasing the participation and to bring out positive outcomes among students. Moreover the motivation and interest level of students is also improved due to gamification. Gamification also positively affects student's knowledge and attitudes; it also deals with increase in skill development of students.

Conclusion: The study concluded that gamification affect learning outcomes and active participation of students positively. The follow-up from the participants revealed that gamification not only increase scholastic performance but also support communicative and analytical growth among learners.

Keywords: Gamification, Active Participation, Learning Outcomes, University Students.

Article History

Received:
March 26, 2025

Revised:
June 15, 2025

Accepted:
June 18, 2025

Online:
June 23, 2025

1. INTRODUCTION

In an era where engagement of digitally native students failed due to traditional lecture-based learning, the incorporation of gamification in education emerges as an encouraging strategy to transform unassertive classrooms into interactive, student-centered learning environments. Games are a critical part of human culture and society and develop motivation and engagement (Bozkurt & Durak, 2018). This is why the artisan of gaming is increasingly transferring to generally game-free contexts. A game refers to

an organized play with goals, rules and challenges to fulfill the purpose of entertainment (Cheng et al., 2015). In 2008 the term gamification was first emerged and gained relevant purpose since 2010 (Deterding et al., 2011) (Seaborn & Fels, 2015). In contradiction to games, gamification is specified for its serious purpose. Gamification extends and usually focuses either on game elements or the process of gaming and gameful experiences in crucial contexts in terms of different definitions. (Deterding et al., 2011) define gamification as the "using game elements in non-game contexts". Game elements includes levels, points, badges, leader boards, avatars, quests, social graphs and certificates (Zainuddin et al. 2020). (Kapp et al. 2014) highlight that to engage people, motivate action, promote learning, and solve problems, usage of game-based mechanics and game-thinking is a salient feature. (Zichermann and Cunningham, 2011) wrote gamification as to solve problems and to engage individuals the process of game-thinking should be adopted. Mechanics of gamification, which includes rewards and loyalty programs for grades in schools, were already being used long before the disclosure of the gamification research at the start. Recently, the concept has been shifted and changed to different contexts, such as in education, in the workplace and even in health, due to its cheaper technology, pursuing of personal data, the movement of game studies and the universality of video games as a new medium (Seaborn & Fels, 2015). Gamification is nearly relevant to two new concepts "serious games" and "game-based learning". Game-based learning is defined as the attainment of predefined learning outcomes in terms of game content and enhancing learning by including problem-solving arrangements and challenges that provide learners, who are identified as players, with a mindset of achievement (Qian & Clark, 2016). The main aim of game-based learning is to educate.

By including gaming elements in educational setup to increase engagement, it is the strategy of gamification in education (Dichev and Dicheva, 2017). The purpose is to bring out levels of involvement equivalent to games that can actually produce (Fardo, 2014). The main goals of gamification are to increase the abilities, establish objectives that give a purpose to learning, engage students, improve learning, keep up changes in behavior and socialize (Knutas et al, 2014), (Krauseetal, 2015), (Dichev and Dicheva, 2017), (Borges et al, 2013). Vitalizing the effect of gamification in an educational context had been covered by the researchers, to get favorable results, such as to increase of engagement and knowledge (Hakulinen and Auvinen, 2014), (Tvarozek and Brza, 2014).

1.2 Problem Statement

In the face of evolving challenges to traditional teaching in higher education, promoting an even more engaged, interactive, and student driven environment becomes a necessity. Pakistani HEIs find themselves seriously trapped in debates surrounding issues such as low student engagement, self-learning and poor academic performance. These issues add to the already over loading factor of unreachable modern tools, considerable memorization and lack of personal feedback mechanisms. There is already a growing need to look into newer educational strategies that might just be effective in stimulating active participation and better-prepared learning outcomes for students.

Gamification has emerged as one of the promising academic innovations in improving student's motivation, engagement, and learning experience in the education sector worldwide. It require such typical elements found in game design: points, badges, leaderboards, challenges, and immediate feedback. However, though this trend has been utilized in several educational system globally, the implication of gamification in the context of HEIs in Pakistan remains at its lowest. Existing literature showed that gamification can lead to upgraded motivation, collaboration, and knowledge recollection of learners. However, data evidence from the context of Pakistan about effectiveness of gamification in influencing student behavior and academic performance in higher education is limited. Hence, it becomes important to find empirical data whether gamification serves as a productive educational tool for enhancing active student participation and academic outcomes in Pakistan.

The research aimed to address this knowledge gap by examining the effects of gamification on learning outcomes, student participation and performance in higher education institutions of Pakistan. By

investigating the implementation through which gamification effects learning behaviors the research embark to give awareness to educators, curriculum developers, and policymakers in order to increase the quality and outcome of education.

1.3 Significance of Study

These activities had intense value for different stakeholders within the higher education system of Pakistan which includes educators, administrators, policymakers, and students. As the higher education sector keeps on developing quality standard to education, it is beneficial to start identifying new techniques that enhance student engagement and performance. Gamification is a penetrating approach of learning in this respect because it can solves important obstacle to disengagement, passiveness, and underperformance of students in higher education.

Gamification leads to different learning styles and provide instant feedback that enhances self-direct learning. It lessens academic anxiety, motivate learners to experiment, and create a safe and encouraging environment for learning. These factors are especially applicable for low paid and underappreciated population of student that struggle with traditional teaching methods.

1.4 Objectives

To evaluate the impact of gamification in strengthening active participation and learning outcomes of students in higher education institutions of Pakistan.

i. To examine the impact of gamification on student motivation in higher education settings.
ii. To access how gamification influences student's interest in academic activities and course content.
iii. To investigate the effect of gamified learning on actual classroom participation and attendance including engagement in discussions, group activities, and assignments.
iv. To determine the effectiveness of gamification in enhancing knowledge acquisition among students.
v. To examine the role of gamification in developing student's academic and practical skills, such as problem-solving, collaboration, and critical thinking.
vi. To explore whether gamification contributes to positive attitude change towards learning and academic responsibilities.

1.5 Research Questions

What is the inclusive effect of gamification on active participation and learning outcomes of students in higher education institutions of Pakistan?

i. In what ways does gamification affect student motivation in higher education settings?
ii. How does gamification influence student's interest in academic activities and course content?
iii. To what extent does the gamified learning effect on student's classroom participation and attendance, including engagement in discussions, group work, and assignments?
iv. How does gamification increase knowledge acquisition among students in higher education?
v. To what extent gamification contribute to the development of student's academic and practical skills, such as problem-solving, collaboration, and critical thinking?
vi. Does gamification lead to a positive change in student's attitudes toward learning and academic responsibilities?

1.6 Study Gap

Gamification has assembled worldwide substantial research attention for its obvious ability to enhance student engagement and learning outcomes, it is oddly underestimating in its approach and through evaluations in higher education contexts in Pakistan. Most of the literature basically focused on developed nations having established digital infrastructures and a culture that encouraged innovations, such as the USA, Canada, and several European countries. Such studies reported then mostly positively about the efficacy of gamification, including enhanced motivation, participation, and academic performance.

Moreover, little empirical research had been conducted in Pakistan to directly explore the dual influence of gamification. First, on active participation (motivation, interest, classroom engagement, and attendance) and second, on learning outcomes (knowledge acquisition, skill development, and attitude change). Most of the available studies seem to focus generally on digital learning in Pakistan or on basic e-learning tools.

The present study focused to cover these gaps through a comprehensive study on the effects of gamification on active participation and learning outcomes among university students of Pakistan, with proposed theoretical contributions as well as actual consequences for educators and policymakers.

2. LITERATURE REVIEW

Jun and Lucas (2024) Research focused on analyzing the effect of gamification elements on academic performance, motivation and engagement of the students from year 2021 to 2024. Systematic review of studies were conducted from major databases such as Science Direct, Google Scholar and Scopus following PRISMA principles. Peer analyzed researchers focused on the elements of gamification like points, badges and leaderboards were selected. Findings showed that the gamification elements significantly increased the motivation of students, helped them to actively participate and are useful in academics. The study concluded that future researches should be longitudinal studies to further evaluate the effects of gamification in different areas. To enhance the effectiveness of gamification in education further researches had to investigate its long-term impacts.

Alsadoon et al (2022). The central inquiry of this study was to analyze the impact of gamified learning environment on computer science students of 8^{th} grade. Gamified e-learning environment was created to investigate the improving impact on the learner's achievements, motivations and gratification to learn the computer course online. This study was conducted during the time period of COVID-19 where online learning and classes were being conducted; this helped in running of successful research, where the gamification environment was set online to investigate its effect. Quasi-experiment was used. The research was conducted on one – hundred thirty three students of 8^{th} grade. The results showed that to learn computer science, the motivation of students increased, also their satisfaction surge with the course, however there was no great impact on their achievements by e-learning gamification environment.

Alsadoon (2023) This research endeavor the effect of digital gamified learning environment on the engagement and motivation of students of university while studying course of computer. Quasi – experiment design was used to conduct this research. The result of the study came out was that students in control and experimental groups had the great difference in the scores with reference to engagement and motivation. The group on which experiment was being done had the high score. In the computer science studies gamification had the important role in enhancing motivation and engagement of students in learning. The research suggested the instructors who teach computer science, take help from online applications and platforms that use gamification. It is also recommended in the research that when gamification has to be used in education then it should be based on principles and theories of gamification.

Hellin et al (2023). This research analyzed student engagement and motivation in programming course having gamification concepts. To check the tool effectiveness of student's engagement and motivation 215 undergraduate students were involved in the survey. The result showed that the gamification had

positively impacted the students by increasing their willingness to actively study in class, enhance their confidence level and they had the healthy competition with their class fellows. Majorly leader-board and point system played the part in increasing motivation of the students. So by using the gamification tools in learning institutions, it could increase the potency among the students of all the disciplines.

Jusas et al (2022). Focused on the actual OOP course gamified and live on the Moodle site through four elements of gamification "experience points, interactive content, localized teams, and global teams." While the local team was specific to the OOP course, the other elements could apply to other courses. During the fall semester of 2020, this was compared to the course that had been held in previous two years when it was conducted without gamification. Although the mean that came out in statistical test was insignificant, the course saw a 7% decrease in student dropouts and a showed decrease in the number of students who were attempting the exam second time. These findings unrevealed the idea that gamification promoted more environment friendly behavior of students. The global team was involving students, which were in the larger groups, as the feedback highlighted by student.

Khoshnoodıfar et al. (2023) The aim of the research was to identify the effects of gamification on learning, especially through hypothesis testing, and to compare the student's attitudes toward the subject to a traditional e-learning technique. This study was conducted at the Guilan University of Medical Sciences, Iran, with 64 health faculty students assigned to a gamified intervention group (n=42) and a control group (n=22). The gamified content included narrative, avatars, levels, points, progress bars, scoreboards, challenges, and feedback, designed according to Landers' theory of gamified content. The findings from the analysis indicated no difference in learning outcome between the two groups. The students under the gamified mediate group had a more positive attitude to learning difficulty and had weak cognitive competency. The students generated overall perception to better outcomes of learning that are feedback, concentration, and challenges in the gamified environment.

Karth et al (2021). The increased interest in how gamification leads to the fostering of positive effects, motivation, behavioral change, and learning, it still remains unresolved in terms of theoretical understanding of its psychological mechanisms. A systematic literature review was conducted on research involving gamification, serious games, and game-based learning, identifying 118 different theories that are connected conceptually with most of them. The connectivity between these theories could lead to the establishment of some central principles that could then be: gamification promotes goal distinction and value, structured pathways, instant feedback, performance reinforcement, and smaller, isolated task-oriented content. Besides, it supports customization via adaptable complexity and goal choice; and promotes a social integrated system through comparison and collaboration.

Jääskä & Aaltonen (2022).Interviewed 22 experienced university instructors formed the basis for exploring the pros and cons of employing GBL in higher education project management courses. Among the results was the effect of GBL on enriched student engagement, interest, and knowledge retention through what teachers describe as memorable learning experiences. GBL has also been found to energize teachers' motivational well-being through innovative and fun ways of teaching. On the negative side, challenges reported included additional cognitive load and stress for students. With insights, then, from both the students' and instructors' perspectives, this study offers a balanced understanding of the impact that GBL poses and insight for teachers who may want to implement it.

Li et al (2022). Using a gamified e-learning system, this paper seeks to study the role of gamification on self-regulated learning by children within the context of English language education in Hong Kong. The quasi-experimental approach for the research study involved primary level 3 students over a semester-long duration, and both quantitative and qualitative data were collected through tests, questionnaires, and interviews. As a result, the findings show that gamification conjures up students' interest toward self-regulated learning, boosts their overall academic performance, as well as helps them devise effective strategies for learning. The study informs practical insights into educators and e-learning designers of how gamified e-learning can be applicable in inducing self-regulation and language learning.

Minh et al (2023). The study seeks to investigate the determinants of young Vietnamese consumer adoption of gamification in online shopping and their subsequent purchasing decisions, especially considering the scenario of COVID-19. A total of 288 valid responses from the questionnaires were analyzed quantitatively to generate the findings. The favorable conditions, effort expectations, social influence, and performance expectations were found to be the main factors influencing the adoption of gamification. Together, they accounted for 54.1% of the intent to adopt gamification and 29.6% of the influence toward shopping behavior. Some practical suggestions are offered based on the findings to improve gamification marketing strategy effectiveness.

Puig et al (2023). This research proposes a dynamic adaptive gamification method that can be used to improve student engagement and retain students in MOOCs. Traditionally, gamification is applied in a one-size-fits-all model or with static adaptive profiles, leaving no room for the dynamic shift of student preferences. Dynamic Adaptive Gamification (Dynamic AG) will update player profiles in real-time on the basis of recorded interactions and student-generated feedback. Its successful evaluation within a nano MOOC on recycling plastics showed this system produced more engagement than a Static Adaptive Gamification (Static AG) alternative. Students using Dynamic AG interacted an average of 12.13 times as compared to 3.21 in the case of Static AG, spending twice more time on the gamification dashboard as evidence of its efficacy in sustaining motivation and interest.

Rahayu et al (2022). This paper examines the effects of gamification on the motivation as well as engagement of the students in e-learning during the COVID-19 pandemic. Qualitative methods and thematic analysis yielded six major themes. Findings from the study indicate that with gamification there are improvements as well as demerits in students' behavior. Points, leaderboards, badges, and gamified tests were some of the most potent gamification elements. These were determinant to the motivation and engagement of the students though the influence may be determined by the population features especially the final-year students. While gamification has great potential in the future, certain aspects of the technology may result in harm; hence, such negative effects have to be considered for future implementations.

Raju et al (2021). With a view to overcoming the challenges imposed by COVID-19 on online education, the study in question used several innovative gamification strategies in a number of engineering courses to boost engagement and motivation. The study, which was held with 56 second-year postgraduate students, introduced a variety of gamified tools including Mentimeter, Edpuzzle, Kahoot, and Quizizz in an effort to maintain interest and participation. The results indicated higher student involvement levels, improvements in conceptual understanding, and heightened competitiveness and collaborative effort. Challenging individual tasks fostered motivation to perform well, while team-based activities helped develop a sense of cooperation and camaraderie. The study highlights how gamification can be an effective innovative approach to enrich the online teaching–learning experience with a large array of tools and platforms.

Oliveira et al (2019). This paper presents a systematic literature review of 50 studies on gamification published from 2011-2016, using qualitative content analysis through Leximancer software. The review has brought to the fore eight major themes: gamification, game, use, users, business, points, engagement, and learning, along with 28 related concepts. The purpose of the study is to summarize the existing research and put forward directions for future investigations, particularly for integrating game design into business, education, and learning. It also shows the effectiveness of using Leximancer as an analysis tool for qualitative data in gamification research production.

Sharma et al (2024). This review thoroughly narrates the entire history of gamification in business, reviewing the researches that had been accomplished between 2012 and 2022 from Scopus and Web of Science. It discusses publication trends and influential contributors as well as key themes under investigating, analyzing the performance or scientist mapping methods, such as co-citation and keyword co-occurrence analysis. The results reveal that further effects from gamification may be seen across all

business domains: improving learning, innovation, marketing, and sustainable management practices. In future developments expected to have video games, further developments will include the metaverse, virtual reality, industry-specific designs such as smart cities and sustainability, as gamification will play a key role in shaping fresh and innovative lines in business.

Smiderle et al (2020). The study seeks to analyze the effects of gamification on the learning, behavior, and engagement of students in an online programming environment, as well as how personality traits might mediate such relations. The experiment was conducted in four months for a group of 40 first-year undergraduate students; an experiment comparing gamified and non-gamified versions of the learning platform (with ranking, points, badges) was conducted. Results are indicative of the different effects of gamification on the students with respect to their personality traits; thus, it highlights the importance of user characteristics in implementing gamified learning experiences.

García et al (2024). This study deals with the effects of digital badges as a form of gamification in higher education, particularly on student motivation and engagement. It involved 150 students undergoing training by a database course. The paper explores the use of digital badges for academic achievements as influenced to learning outcomes. Results were based on objective and subjective measures and show positive impacts on student learning through digital badges in maintaining interest and minimizing distractions.

Kim & Castelli (2021) For this meta-analytic review, the campus effect of gamified interventions, such as digital badges, is being studied in terms of student behavioral change. The analysis of 69 studies published between 2010 and 2019 indicates that gamification has a moderate yet positive effect (Cohen's d = 0.48), with higher effects in adults in higher education (ES = 0.95) than in K-12 students (ES = 0.92). While short interventions of less than a week were found to be significantly more effective than longer (up to 20 weeks, ES = 0.30), the latter resulted in a much lower ES at 1.57. Such interventions, as the review concludes, can yield better results in initiating behavior change as well as learning outcome improvement than long-term ones.

2.1 Theoretical Framework

The study is supported by many well-established educational theories that explain how gamification can effect learner engagement and academic performance. The fundamental theoretical foundations of this study were drawn from self-determination theory (SDT) and constructivist learning theory each contributing a sight to understand the artisan through which gamification may impact student's learning experiences.

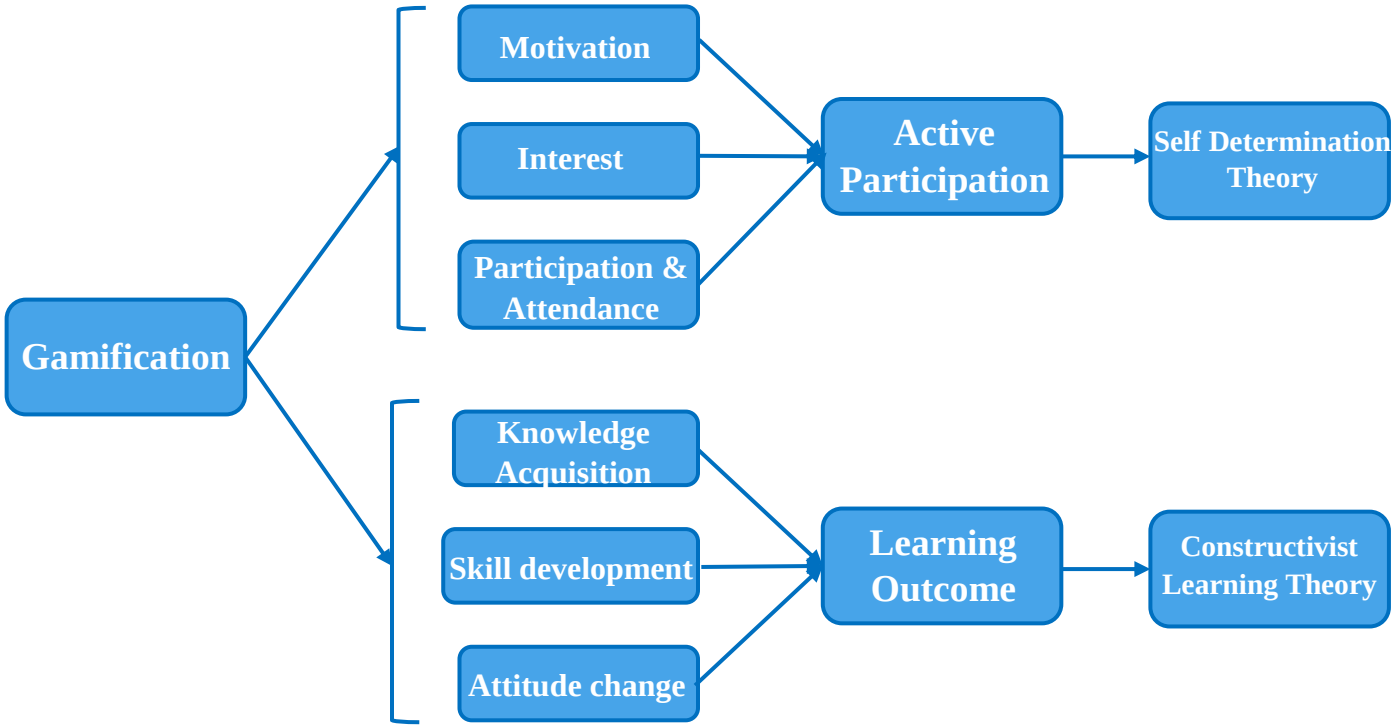
There is expectation from educational process that student's active involvement can be increased by gamification, and it also make learning more interactive, goal-driven, and enjoyable. In higher education institutions in Pakistan the conventional lecture-based methods are still proponent, gamification gave a replacement that is student-centered and it could make learning environments more active and participatory.

Self-Determination Theory presented by Deci & Ryan in 1985 had a major role in explaining how gamification effects active participation of students which is then followed by motivation, interest and class participation and attendance. SDT explains that motivation could be intrinsic "driven by interest and enjoyment" or extrinsic "driven by external rewards" (Vallerand, 2000). Gamification sway both types by creating an environment for learning where students are not only recognized for their efforts but also find the learning process engaging and fulfilling. A sense of competence is provided by the game elements like levels and progress bars, whereas sense of relatedness is fulfilled by collaborative tasks and leaderboards. These aspects increase overall student's motivation in learning tasks.

The second major outcome addressed in this study is learning outcomes, which are conceptualized as the acquisition of knowledge, development of skills, and positive change in attitudes. The second concept "learning outcome" in the research is linked with constructivist learning theory given by Vygotsky in

1978, which explained that learning is a functioning and a process to construct knowledge rather than receive information casually (Narayan et al., 2013). Gamification encouraged trial and error learning by engaging students in different problem-solving tasks and challenges and it also need the theoretical based knowledge in practical framework.

Study Model:



3. METHODOLOGY

3.1 Research Design

The present study, under its quantitative research design, explored how gamification effects active participation and academic performance of students in institutions of higher education within Pakistan. In this design, numerical data was precisely collected and analyzed to test hypothesis of a relation between independent variable "gamification" and dependent variables "active participation" and "learning outcomes". A cross-sectional survey of students from different higher education institutions in Pakistan was taken on. The structured questionnaire was prepared to collect responses from number of students. The questionnaire covered different features of active participation including interest, motivation, attendance and classroom participation, as well as learning outcomes such as knowledge gain, skills development and attitude change. The survey was consisted of a 5-point Likert scale ranging from "Strongly disagree to strongly agree" to assess student's responses on their experiences with gamified learning environments. Data was analyzed in both descriptive statistics to summarize the findings as well as inferential statistics such as correlation and regression analysis.

3.2 Population

The target population for this quantitative study was the students enrolled in higher educational institutions in Pakistan. This included students from public and private universities. The students, from different disciplines and different levels, from undergraduate to postgraduate programs, were considered for a complete evaluation to identify the impact of gamification in diverse educational backgrounds.

3.3 Sample Size and Technique

In order to carry out the proper rationality of the results, this study targeted a sample of approximately 300 students. This range was sufficient for the statistical analysis of correlation and regression and to popularize results with regard to the whole higher education student population of Pakistan.

The sample was random-stratified divided according to disciplines, levels of study "under to post-graduate", and types of institutions "public or private" to ensure representative participation from all of such diverse populations. Then, randomly inside each division the participants were selected in order to reduce biasness. This study enabled that how gamification effect students from different academic and demographic backgrounds.

3.4 Data Collection

This research was quantitative and data had been collected through a self-administered questionnaire designed to measure how gamification effects student's active participation and learning outcomes across higher educational institutions in Pakistan. The questionnaire was distributed through online means, to increase extent and to ensure that students from different universities had questionnaire. Participation was done voluntary, and respondents were given assurance about confidentiality and anonymity so that they could provide honest opinion about the matter discussed in the research and to prevent bias in responses. The questionnaire was distributed among 300 individual from which 264 students filled it, so according this number of responses the response rate was calculated as 88%.

3.5 Data Analysis Technique

The data that was collected from the structured questionnaire was analyzed using statistical techniques to find out the relation between gamification and student's active participation and learning results. (SPSS) Statistical Package for Social Sciences software was used to analyze data for the research. Descriptive along with inferential statistics which include percentages, frequencies, means, standard deviations, correlation, T-test and linear regression were used to evaluate the collected data.

4. RESULTS

Table 1: *Characteristics of Respondents*

Sr. No.	Respondent Information	Description of Characteristics	F	%
1	Age	16-20	26	9.8
		21-25	113	42.8
		26-30	73	27.7
		31-35	39	14.8
		35 above	13	4.9
2	Gender	Male	100	37.9
		Female	164	62.1
3	Academic Qualification	Undergraduate	98	37.1
		Graduate	132	50.0
		Postgraduate	34	12.9
4	Field of Study	Natural Sciences	110	41.7
		Social Science & Humanities	154	58.3

Table 1 represents the characteristics of respondents. The information included the age, gender, academic qualification and field of study of the individuals who filled the survey. The results showed that individuals aged 21-25 had filled the questionnaire more. There is more of females than males. The individuals who participated in the survey were mainly graduated and belong to the departments of social sciences and humanities.

Table 2: *Correlations among the variables*

	1	**2**	**3**	**4**	**5**	**6**	**7**
Age	1	-.107	.540**	.048	.066	.062	.003
Gender		1	-.038	.259**	.063	.060	.031
Academic Qualification			1	.166**	.099	.068	-.018
Field of study				1	.143*	.099	.078
IV _ Gamification					1	.590**	.500**
DVI						1	.706**
DVII							1

Table 2 presents the correlation grid which shows the relationships among demographic and educational variables, independent variable "gamification", and two dependent variables DV I "Active Participation" and DV II "Learning Outcomes". Age had the inverse relationship with gender (r = -0.107) but had a positive correlation with academic qualification (r = 0.540**), Gender showed the negative correlation with academic qualification (r = -0.038) while with field of study it had moderate positive correlation (r = 0.259**). Independent variable "gamification" strongly correlates with both dependent variables (r = 0.590** and r = 0.500**), indicating a considerable hold on these outcomes. Both dependent variables are suggested to be closely related as they displayed a very strong positive correlation (r = 0.706**).

Table 3: *T-Test*

	t	**df**	**Sig. (2-tailed)**	**Mean Difference**	**95% Confidence Interval of the Difference**	
					Lower	**Upper**
IV Gamification	104.228	263	.000	28.689	28.15	29.23
DVI	111.101	263	.000	53.943	52.99	54.90
DVII	115.285	263	.000	50.364	49.50	51.22

The results of t-tests comparing the sample means of three variables—IV Gamification, DV I, and DV II are represented in the table. The t-value of independent variable "gamification" is 104.228 with a 95% CI ranging from 28.15 to 29.23. For the DV I "Active Participation" The t-value is 111.101 with a 95% CI between 52.99 and 54.90. The t-value for the dependent variable II "Learning Outcome" is 115.285 with a 95% CI ranging from 49.50 to 51.22. These results collectively indicate that all three variables gamification along with active participation and learning outcomes significantly differ from a potential population, with the mean differences being valuable and analytically reliable.

Table 4: *Regression analysis on DVI*

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	24.104	2.556		9.432	.000
	IV Gamification	1.040	.088	.590	11.817	.000

a. Dependent Variable: DVI

The results of a simple linear regression analysis examining the relationship between the independent variable "Gamification" and the dependent variable I "Active Participation" are being presented in the table**.** The unstandardized coefficient (B) for Gamification is 1.040, indicating that for each unit increase in gamification, active participation is expected to increase by 1.040 units, holding all other factors constant. The standardized coefficient (Beta) is 0.590, suggesting a moderate positive relationship between gamification and active participation**.** The t-value of 11.817 and the associated p-value of 0.000 indicate that this relationship is statistically significant at ordinary levels. These findings revealed that gamification is a significant predictor of active participation**,** with a moderate effect size.

Table 5: *Regression analysis on DVII*

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	27.612	2.466		11.197	.000
	IV Gamification	.793	.085	.500	9.337	.000

a. Dependent Variable: DVII

The table presents the results of a simple linear regression analysis examining the relationship between the independent variable 'Gamification" and the dependent variable II "Learning Outcomes". The unstandardized coefficient (B) for Gamification is 0.793, learning outcome is expected to increase by 0.793 units. The standardized coefficient (Beta) is 0.500, suggesting a moderate positive relationship between gamification and learning outcome. The t-value of 9.337 and the associated p-value of 0.000 indicate that this relationship is statistically significant at standard levels. These findings suggest that gamification is a significant interpreter of learning outcome**.**

5. DISCUSSION

The incorporation of gamification into higher education has assembled the increasing attention due to its ability to enhance student engagement and academic performance. The study aimed to evaluate the effectiveness of gamification in strengthening two important aspects of student engagement i.e. Active Participation and Learning Outcomes in Higher Education Institutions of Pakistan.

Active participation was examined through the sub-variables: Motivation, Interest, Participation and Attendance. The research showed that the use of gamification strategies, such as point systems, leaderboards and badges increase student motivation and sustain interest in course activities. The main feature of gamified environment are intrinsic and extrinsic rewards on which motivation is usually managed. The sense of achievement, progress tracking, grades and recognition are included (Deterding et al., 2011). Interest due to gamification is accordant with former research showing that in learning environment the elements which are game-like increase greater analytical and emotional investment in learning tasks (Hamari et al., 2014). For the students who are hesitant to participate are encouraged because of point-based participation knowing their efforts would be recognized (Kapp, 2012). There is also a positive correlation of gamification with attendance rates. Students are more likely to attend classes regularly after realizing that their attendance might affect the scores and unbolting the rewards (Domínguez et al., 2013).

Knowledge Acquisition, Skill Development, and Attitude Change were combined to evaluate the learning outcomes of students that are exposed to gamification. Due to repetitive tasks and instant feedback knowledge acquisition was effectively promoted (Landers, 2014). Gamification promote practical abilities such as critical thinking, problem-solving, and collaboration which effect skill development collectively. This discovery also aligns with earlier studies which showed gamification particularly is effective in building both cognitive and interpersonal skills (Sitzmann, 2011). The participants responded a more positive attitude toward academic content that is linked with growth mindset and were more willing to

take on challenges, fail, and try again behaviors (Su & Cheng, 2015). To utilize the full aptitude of gamified learning the challenges such as digital inclusion, faculty training, and curriculum designing must be addressed.

5.1 Theoretical Implication

The study offered an extensive understanding of how gamification increase active participation with implying self-determination theory, in order to achieve the psychological needs. Gamification restore intrinsic motivation through the use of game elements. The findings suggested that when students consider the learning environment as pleasurable their internal drive to participate in academic activities increase, therefore SDT is fully validated to gamification in higher education institutions of Pakistan.

Moreover the research is supported by the Constructivist Learning Theory that how gamification is helpful in contributing to learning outcomes positively. The gamification motivates knowledge acquisition, help in the skill development and hold up attitude change. This orientation with constructivist principles reinforces the prospective of gamification to change conventional classrooms into student centered environment.

6. CONCLUSION

This research investigated the effectiveness of gamification in strengthening active participation and learning outcomes of students in Higher Education institutions of Pakistan. The independent variable was gamification with dependent variables Active participation and Learning outcomes. The effect of gamification was analyzed on motivation, interest, attendance, knowledge acquisition, skill development and attitude change of students in Pakistan. Questionnaire based on likert scale was designed and filled by 264 individuals. Data was collected and several statistical tests were applied on data to generate the results.

The findings provide strong affirmation that gamification, when considerately implemented, it notably change the learning experience. By assimilating game elements such as points, badges, leaderboards, and interactive challenges, educators are able to strengthen student motivation, interest, and engagement which lead to higher levels of class participation and improved attendance.

Moreover, gamification also positively affect learning outcomes. Students exhibit better knowledge acquisition, increase skill development, and a noteworthy reposition in attitudes toward learning. These outcomes from the participants revealed that gamified environments not only encourage academic performance but also support behavioral and logical growth among learners.

Acknowledgments

None.

Disclosure Statement

No potential conflict of interest was reported by the authors.

Funding Source

The authors received No funding to conduct this study.

ORCID's

Hafsa Khan [1] https://orcid.org/0009-0000-3701-9141
Ghulam Safdar [2] https://orcid.org/0000-0002-5152-0052

REFERENCES

Alsadoon, H. (2023). The Impact of Gamification on Student Motivation and Engagement: An Empirical Study. *Dirasat: Educational Sciences*, *50*(2), 386–396. https://doi.org/10.35516/edu.v50i2.255

Alsodoon, E., Alkhawajah, A., Suhaim, A, B. (2022). Effects of a gamified learning environment on students' achievement, motivations, and satisfaction. *Heliyon*, *8*(1), 1-8. https://doi.org/10.1016/j.heliyon.2022.e10249

Bozkurt, A., & Durak, G. (2018). A systematic review of gamification research: In pursuit of homo ludens. *International Journal of Game-Based Learning*, *8*(3), 15–33. https://doi.org/10.4018/IJGBL.2018070102

Cheng, M.-T., Chen, J.-H., Chu, S.-J., & Chen, S.-Y. (2015). The use of serious games in science education: A review of selected empirical research from 2002 to 2013. *Journal of Computers in Education*, *2*(3), 353–375. https://doi.org/10.1007/s40692- 015-0039-9

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification. In Proceedings of the 15th international academic MindTrek conference on envisioning future media environments - MindTrek '11 (pp. 9–15). https://doi.org/10.1145/2181037.2181040

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: defining gamification. *Proceedings of the 15th International Academic MindTrek Conference*.

Dichev, C., & Dicheva, D. (2017). Gamifying education: what is known, what is believed and what remains uncertain: a critical review. *International Journal of Educational Technology in Higher Education*, *14*(1), 1-9.

Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., & Martínez-Herráiz, J.-J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education*, *63*, 380–392.

Fardo, M.L. (2014). The impact of gamification on students' learning, engagement and behavior based on their personality traits. Master's thesis, *Universidade de Caxias do Sul*. https://repositorio.ucs.br/handle/11338/457

García,L.V., María D. P., Blanco,L., Antonio Cedillo-Hernández, Eduardo Bustos-Farías. (2024). Gamification in the Classroom: Motivating Higher Education Students Using Digital Badges. *International Journal of Learning and Teaching*, *10*(4), 532-538. https://doi.org/10.18178/ijlt.10.4.532-538

Hakulinen, L., & Auvinen, T. (2014). The effect of gamification on students with different achievement goal orientations, *In 2014 International Conference on Teaching and Learning in Computing and Engineering (LaTiCE).* https://doi.org/10.1109/latice.2014.10 (pp. 9–16): IEEE.

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on gamification. *In 47th Hawaii International Conference on System Sciences.*

Hellín, C.J., Calles-Esteban, F., Valledor, A., Gómez, J., Otón-Tortosa, S., Tayebi, A. (2023) Enhancing Student Motivation and Engagement through a Gamified Learning Environment. *Sustainability*, *15*(1), 1-20. https://doi.org/10.3390/su151914119

Jääskä. E., Aaltonen.K. (2022). Teachers' experiences of using game-based learning methods in project management higher education, *Project Leadership and Society*, *3*, 2666-7215, https://doi.org/10.1016/j.plas.2022.100041

Jun, M., Lucas, T. (2024). Gamification elements and their impacts on education: A review. *Multidisciplinary Reviews*, *8*(1), 1-7. https://doi.org/10.31893/multirev.2025155

Jusas, V., Barisas, D., Janciukas, M. (2022). Game Elements towards More Sustainable Learning in Object-Oriented Programming Course. *Sustainability*, *14*, 2325. https://doi.org/10.3390/su14042325

Kapp, K. M. (2012*). The gamification of learning and instruction: Game-based methods and strategies for training and education*. John Wiley & Sons.

Kapp, K. M., B, K. M., Blair, L., & Mesch, R. (2014). *The gamification of learning and instruction fieldbook: Ideas into practice*. Wiley.

Khoshnoodıfar M, Ashourı A, Taherı M. (2023). Effectiveness of Gamification in Enhancing Learning and Attitudes: A Study of Statistics Education for Health School Students. *Journal of Advances in Medical Education & Professionalism*, 11(4), 230 239. https://doi.org/10.30476/JAMP.2023.98953.1817

Kim, J., Castelli, D.M. (2021). Effects of Gamification on Behavioral Change in Education: A Meta-Analysis. *International Journal of Environmental Research and Public Health*, 18, 3550. https://doi.org/10.3390/ijerph18073550

Knutas, A., Ikonen, J., Nikula, U., Porras, J. (2014). Increasing collaborative communications in a programming course with gamification: a case study, *In Proceedings of the 15th International Conference on Computer Systems and Technologies*. https://dl.acm.org/citation.cfm?id=2659620 (pp. 370–377): ACM.

Krath, J., Schürmann, L., & von Korflesch, H. F. O. (2021). Revealing the theoretical basis of gamification: A systematic review and analysis of theory in research on gamification, serious games and game-based learning. *Computers in Human Behavior*, *125*, Article 106963. https://doi.org/10.1016/j.chb.2021.106963

Landers, R. N. (2014). Developing a theory of gamified learning: Linking serious games and gamification of learning. *Simulation & Gaming*, *45*(6), 752–768.

Li, X., Xia, Q., Chu, S.K.W., Yang, Y. (2022). Using Gamification to Facilitate Students' Self-Regulation in E-Learning: A Case Study on Students' L2 English Learning. *Sustainability*, *14*, 7008. https:// doi.org/10.3390/su14127008.

Narayan, R., Rodriguez, C., Araujo, J., Shaqlaih, A., & Moss, G. (2013). Constructivism—Constructivist learning theory. In B. J. Irby, G. Brown, R. Lara-Alecio, & S. Jackson (Eds.), *The handbook of educational theories* (pp. 169–183). IAP Information Age Publishing.

Oliveira, Abílio & Rodrigues, Helena & Rodrigues, Luis. (2019). Main gamification concepts: A systematic mapping study. *Heliyon*, *5*. https://doi.org/10.1016/j.heliyon.2019.e01993.

Puig, A., Rodríguez, I., Rodríguez, A., Gallego, I. (2023). Evaluating Learner Engagement with Gamification in Online Courses. *Appl. Sci*, *13*, 1535. https://doi.org/10.3390/app13031535

Qian, M., & Clark, K. R. (2016). Game-based learning and 21st century skills: A review of recent research. *Computers in Human Behavior*, *63*, 50–58. https://doi.org/10.1016/j. chb.2016.05.023

Rahayu, F.S., Nugroho, L.E., Ferdiana, R., Setyohadi, D.B. (2022). Motivation and Engagement of Final-Year Students When Using E-learning: A Qualitative Study of Gamification in Pandemic Situation. *Sustainability*, *14*, 8906. https://doi.org/10.3390/su14148906

Raju, R., Bhat, S., Bhat, S., & Singh, A. B. (2021). Effective usage of gamification techniques to boost student engagement. *Journal of Engineering Education Transformations*, *34*, 713-717.

Seaborn, K., & Fels, D. I. (2015). Gamification in theory and action: A survey. *International Journal of Human-Computer Studies*, *74*, 14–31. https://doi.org/10.1016/j.ijhcs.2014.09.006

Sharma, Wamika & Lim, Weng & Kumar, Satish & Verma, Aastha & Kumra, Rajeev. (2024). Game on! A state-of-the-art overview of doing business with gamification. *Technological Forecasting and Social Change*. 198. https://doi.org/10.1016/j.heliyon.2019.e01993.

Sitzmann, T. (2011). A meta-analytic examination of the instructional effectiveness of computer-based simulation games. *Personnel Psychology*, *64*(2), 489–528.

Smiderle, R., Rigo, S.J., Marques, L.B. (2020). The impact of gamification on students' learning, engagement and behavior based on their personality traits. *Smart Learn. Environ*, *7*(3). https://doi.org/10.1186/s40561-019-0098-x

Su, C. H., & Cheng, C. H. (2015). A mobile gamification learning system for improving the learning motivation and achievements. *Journal of Computer Assisted Learning*, *31*(3), 268–286.

Vallerand, R. J. (2000). Deci and Ryan's self-determination theory: A view from the hierarchical model of intrinsic and extrinsic motivation. *Psychological inquiry*, *11*(4), 312-318.

Zainuddin, Z., Chu, S. K. W., Shujahat, M., & Perera, C. J. (2020). The impact of gamification on learning and instruction: A systematic review of empirical evidence. *Educational Research Review*, *30*. https://doi.org/10.1016/j.edurev.2020.100326

Zichermann, G., & Cunningham, C. (2011). *Gamification by design: Implementing game mechanics in Web and mobile apps*. O'Reilly Media, Inc.