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Perceptions of gamification in education: Evidence from a developing country context

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Abstract

The study examined university students' perceptions of using gamification in an educational technology-related course. The study employed a descriptive exploratory mixed-methods approach using a one-group pre-post design. The use of the gamification approach lasted for three weeks. The participants were female students enrolled in an "introduction to educational technology" course in the second semester of the 2024/2025 academic year at a university in Kuwait. The class had 50 students. Data were collected using a questionnaire over two rounds. The results showed that students consistently held positive perceptions of gamification, both before and after a three-week intervention, with high mean scores across dimensions such as engagement, motivation, interactivity, and learning effectiveness. Although no statistically significant differences were found between pre- and post-intervention responses, slight increases were observed in students' enthusiasm, willingness to recommend gamified courses, and appreciation for interactive elements. Open-ended responses reinforced these findings, highlighting motivational, cognitive, social, and organizational benefits. At the same time, some concerns were raised about classroom disruption, competitiveness, and technical issues. However, students' overall views became more balanced and accepting after experiencing gamification. Based on the findings, a set of recommendations was provided.

Keywords: gamification in education, students' perceptions, active learning, developing country

INTRODUCTION

> The usage of gamification in education is a massive benefit for motivation, user interaction, and social effects (Saleem et al., 2022, p. 139).

The study examined university students' perceptions of using gamification in an educational technology-related course. Gamification is not exclusive to education and involves the application of game design elements and/or game mechanics in non-game settings. Gamification in education involves integrating components and mechanics typically found in games into non-recreational environments to enhance the educational process (Jaramillo-Mediavilla et al., 2024). Several terminologies are used to describe the usage of gamification in education, e.g., serious games, edugames, games for education, game-based learning, and gameful design in education (Majuri et al., 2018)

The gamification has been defined in various ways:

> the strategic application of game design principles, mechanics, and elements into non-game environments. It is often facilitated using digital platforms, aiming to solve problems, increase engagement, and motivate individuals towards their goals (Christopoulos & Mystakidis, 2023, p. 1223).

> is using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems (Medica Ružić & Dumančić, 2015, p. 199).

> using game elements for scholastic development in formal and informal settings (Khaldi et al., 2023, p. 8).

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Contribution to the literature

- The article provides empirical evidence on university students' perceptions of gamification in a developing-country context (Kuwait), focusing on female undergraduates.
- The work reveals motivational, cognitive, social, and organizational benefits of gamification
- The study also notes challenges such as disruption, competitiveness, and technical issues, with practical recommendations for higher education.

> the use of game attributes. Outside the context of a game with the purpose of affecting learning (Rivera & Garden, 2021, p. 1000).

Based on these definitions, rather than simply playing games, gamification in education is a purposeful pedagogical approach that aims to enhance engagement, motivation, and learning outcomes in educational contexts. Gamification involves applying the principles of game design to learning activities, making them more interactive and enjoyable. Although some researchers have emphasized the distinct characteristics of gamification as involving the incorporation of specific game elements, it does not entail transforming the learning process into a fully developed game (Rivera & Garden, 2021). The gamification elements identified across the studies include challenge, collaboration, digital badges, feedback, Avatars, points and rewards, leaderboards, immediate feedback, exploration, storytelling, and experience systems (Khaldi et al., 2023; Rahman et al., 2018).

Gamification is considered a form of active learning, as it promotes learner-centered strategies that enhance hands-on interaction. Gamification has been shown to positively influence learning outcomes for both young and older learners by fostering higher levels of student engagement and participation (Alahmari et al., 2023; Fernández-Velásquez et al., 2025; Magpusao, 2024; Waluyo et al., 2023). The conceptual foundation that supports gamification in education is a set of intersecting psychological and educational theories. These theories focus on the importance of motivation and engagement in students' learning. These theories include self-determination theory (SDT), behaviorist theories, constructivist learning theories, and flow theory (Ahmad et al., 2019; Chan et al., 2019; Gupta & Goyal, 2022; Kam & Umar, 2018).

SDT assumes multiple dimensions of motivation which can be arranged according to the self-determination continuum (Deci & Ryan, 2000, 2013). At the top of this continuum lies intrinsic motivation, the most representative form of self-determined motivation, and includes performing an activity for its inherent satisfaction and enjoyment (Deci & Ryan, 2000, 2013). The second type of motivation is extrinsic motivation, which refers to participation and engagement in an activity for external reasons (Deci & Ryan, 2000, 2013). SDT focuses on three basic psychological needs: autonomy, competence, and relatedness, where fulfilling these needs enhances intrinsic motivation and overall personal growth (Deci & Ryan, 2000, 2013). In this context, gamification can significantly affect students' motivation by considering these three basic psychological needs. Gamification can offer learners choices and control in their learning, provide feedback and progress indicators for learners like levels and scores, and foster relatedness via collaborative or competitive elements such as team challenges or leaderboards.

Behaviorist theories view human behavior as acquired through learning and influenced by environmental factors that change responses through mechanisms such as reinforcement, punishment, and imitation (Skinner, 1965). According to behaviorists, learning occurs because of the relationship between stimulus and response, and reinforcement. Such a relationship is considered one of the most important factors in strengthening desired behavior (Skinner, 1965). In this context, gamification can provide learners with positive reinforcement through game elements such as points, badges, rewards, and leaderboards to positively reinforce desired behaviors. In addition, gamification can provide learners with instant feedback through scores or progress bars that represent timely reinforcement to strengthen behavior. Furthermore, gamification encourages frequent engagement to build habits, e.g., completing levels, and can condition learners to associate specific cues such as sounds, visuals, and achievement with motivation.

Constructivist learning theories view learning as a process of constructing new knowledge, where the learner builds their own understanding of the world through interaction with the environment and personal experience, rather than simply receiving information passively (Jonassen et al., 1993, 2003). Gamification can support constructive learning by creating engaging, meaningful, and interactive learning experiences, where gamification incorporates elements like challenges, problem-solving, storytelling, and feedback.

Flow theory proposes that flow experiences are characterized by a balance between challenge and skills, as well as by a person's interest, control, and focused attention during a task. Those flow experiences can lead to optimal learning (Csikszentmihalyi, 1990). Gamification can be used to facilitate this flow experience by providing structured challenges with

progressive levels of difficulty and delivering instant feedback through game elements that are meaningful and aligned with learning goals.

The use of gamification in education began to emerge in the early 2000s (Dreimane, 2021). Initially, it involved the informal application of game-based elements, such as incentive programs and point-based systems. However, the later development in information and communication technology has made gamification in education more common (Özdemir, 2025). For instance, the development of smart mobile phones, e-learning technologies, and social media has increased the adoption of gamification in education. In the meantime, gamification in education has found its way to the learning environment through specialized electronic tools such as Kahoot!, ClassDojo, and Duolingo. In addition, gamification is starting to be integrated with artificial intelligence and augmented and virtual reality (Pardim et al., 2025). In line with the development of information and communication technologies and their application in gamification, structured pedagogical frameworks have been adopted to guide their implementation in education. For instance, gamification has been aligned with approaches that support personalized learning experiences (Ristianto et al., 2025).

In developed countries, several factors contribute to conceptualizing and implementing gamification in education. These factors include access to advanced technologies, digital infrastructure, and pedagogical innovation (Ghoulam et al., 2024). Therefore, much of the existing research on gamification has been grounded in the experiences of students and educators in these contexts. Despite the growing global interest in gamified learning, there is a clear gap in research exploring how students in developing countries perceive and engage with gamification. Therefore, it is important to examine whether their perceptions align with those in developed countries. The significance of exploring perceptions of gamification in education within developing countries' contexts stems from the need to adopt innovative approaches that can enhance student performance. In many developing country settings, traditional instructional methods often dominate classrooms, and students may experience lower levels of engagement. Gamification offers a promising strategy to transform passive learning environments into a learner-centered one. Understanding how learners respond to such approaches provides critical insights into how educational innovation can be effectively adopted. Moreover, it highlights the potential of gamification to support educational reform, foster 21st century skills, and align teaching practices with global trends in digital pedagogy.

Kuwait is considered a developing country, where faculty members largely continue to rely on traditional teaching methods, and university students are generally accustomed to these conventional instructional approaches (Afailakawi et al., 2024). However, as is the case in many other developing countries, Kuwait is looking to develop and improve its higher education system by enhancing the quantity and quality of education (Almisad, 2015). For instance, Kuwait vision 2035 is looking to utilizing resources and capabilities to develop individuals' creative skills, knowledge, and competencies in order to support innovation and enhance competitiveness in the economy and society (State of Kuwait, 2024). One way to develop higher education systems is to adopt technological and pedagogical innovations. In the era of digital revolution, gamification is an educational innovation that involves the integration of digital technologies. The utilization of technological and pedagogical innovations should be supported by research to ensure effective implementation. This is particularly important given the limited research on the use of gamification in education and its potential benefits in developing countries (Afailakawi et al., 2024; Ghoulam et al., 2024). The current study is particularly relevant for developing countries (e.g., Kuwait), where, as previously noted, traditional, teacher-centered methods continue to dominate educational practice (Dashti, 2019). Therefore, examining and understanding students' reactions to new student-centered teaching strategies that integrate technology can help these educational systems adopt and implement such methods effectively. Such understanding is an important success factor for their integration.

GAMIFICATION IN HIGHER EDUCATION

> Integrating gamification in the learning process has become a significant factor in the success of teaching, learning, and research in higher education (Ofosu-Ampong et al., 2020, p. 1723).

The literature shows that gamification is widely adopted in higher education to achieve various academic goals, including enhancing students' engagement, interest, and motivation (Cózar-Gutiérrez & Sáez-López, 2016); improving academic achievement and attitudes toward learning (Yildirim, 2017); promoting positive behavioral change (Kim & Castelli, 2021); and enriching engagement, enjoyment, and overall learning experiences (Korkealehto & Siklander, 2018). Gamification was adopted as a teaching strategy in various academic disciplines such as language learning (Lin, 2022), science education (Kalogiannakis et al., 2021), mathematics education (Hilario et al., 2022), engineering education (Markopoulos et al., 2015), and medical education (Ahmed et al., 2015). Furthermore, gamification was employed in different modes of education, such as online, face-to-face, and blended learning (Aguiar-Castillo et al., 2020; Khaldi et al., 2023).

In the studies that examined gamification, various game elements were used. The most frequently used elements include points, badges, leaderboards, levels, experience points, challenges, feedback, and avatars (Khaldi et al., 2023; Rahman et al., 2018). Some studies incorporated more complex elements such as quests, timers, progress bars, group competition, medals, and keys to unlock content (Khaldi et al., 2023; Rahman et al., 2018). In terms of the theoretical framework that guides the implementation of gamification, many studies lacked a defined theoretical foundation (Khaldi et al., 2023). While other previous studies showed variation of the adopted theories, examples of these theories include SDT (van Roy & Zaman, 2019), personalized gamification design model (Zaric et al., 2020), flow theory (Chan et al., 2019), constructivism (Machmud et al., 2023), and behaviorism (Ziyar et al., 2024).

Several studies have examined students' perceptions of gamification in different subjects and in different parts of the world. For instance, in Slovenia, Rajšp et al. (2017) examined students' perceptions of gamification following their participation in a gamified segment in a course offered for first year master students at the informatics and technologies of communication program. The study involves collecting data using an online questionnaire from 15 students. The results showed that the students had a favorable view of gamification in learning contexts. The students firmly believed that the gamification of courses could contribute to their motivation and learning achievements.

In another study conducted in Indonesia, Etfita et al. (2023) investigated students' perceptions toward using gamification through Netboard in an English language course in a Journalism classroom. The study followed a descriptive research design in which 47 students completed a questionnaire with seven subscales: perceived utility, knowledge, engagement, enjoyment, motivation, ease of use, and use preference. The results showed high levels of student agreement across all seven measured indicators regarding gamification. The mean agreement percentages were as follows: About two-thirds of the participants agreed with the statements across all indicators. These results suggest that students found gamification on Netboard helpful, engaging, enjoyable, and motivating, and they expressed an evident willingness to use gamification in other courses. In another study conducted in Indonesia, Susanto (2025) examined students' reflective attitudes toward using Kahoot! in English reading classes, focusing on its impact on engagement, motivation, comprehension, and peer interaction. Ten students participated in this study. The data collection tools were semi-structured interviews and classroom observations. The results showed that the students believed in the use of Kahoot! significantly increased their engagement by making learning to read interactive and enjoyable. They reported increased motivation and a more positive attitude toward reading, mainly due to a gamification strategy. In addition, the students believed that Kahoot! enhanced their reading comprehension since it assisted their focus on the important points in the text through repeated experience and instant response. The study also highlighted how Kahoot!'s encouragement of friendly contests and peer interaction contributed to a more dynamic and cooperative learning environment. Nevertheless, technical challenges were identified as a limitation, negatively impacting the platform's overall efficiency, mainly those relating to a stable internet connection.

In another study conducted in Spain, Garcia-Iruela and Hijón-Neira (2020) examined students' perceptions of gamification elements integrated into higher education courses using the Moodle platform. The study involved three separate experiences of varying durations that included 2 weeks, 4 weeks, and a full academic year, where students interacted with various gamified components such as points, levels, missions, feedback, badges, leaderboards, blocked content, and time limits. Data were collected via questionnaires completed by a total of 320 students. The findings revealed that feedback, levels, points, and missions were consistently the most positively evaluated elements across all experiences. In contrast, leaderboards and blocked content received the lowest ratings. While badges were appreciated in the longer experiences, they were not well received in the shorter ones. Additionally, the time limit element was generally perceived negatively, though it was somewhat tolerated in shorter implementations. These results suggest that while gamification can enhance engagement and motivation, certain elements must be carefully designed and implemented to avoid negative impacts on the learning experience. In Thailand, Aguilos and Fuchs (2022) examined undergraduate students' perceptions of the use of gamification in a massive open online course. The research followed a qualitative design that included interviewing 19 participants. The result showed that students' competitive behavior has a significant effect on students' marks in the activities. Additionally, students found the immediate feedback and evaluation to be highly motivating due to the sense of instant gratification it provided.

Limited studies have been conducted in the Arab world to examine students' perceptions and attitudes toward gamification. One of these studies was conducted in Saudi Arabia, Alabbasi (2017) investigated graduate students' views on the use of gamification techniques in online learning environments. The research adopted an exploratory approach and used a questionnaire as the data collection tool. Forty-seven graduate students enrolled in an instructional technology program participated in the study, using a learning management system that incorporates

gamification elements (TalentLMS). The results revealed a positive perception among graduate students toward the use of gamification tools in online learning. Students expressed a preference for learning environments that were challenging, cognitively demanding, and sophisticated, as such environments contribute to enhancing competence, memory retention, focus, attention, commitment, and social interaction. In another study conducted in Saudi Arabia, Nyazi (2023) explored the perceptions of undergraduate female students regarding the integration of gamification into education. A descriptive methodology was employed. Eighty-six students completed the questionnaire. The results indicated positive perceptions toward the use of gamification among undergraduate students. They revealed statistically significant differences between students at the college of law and the college of business administration, in favor of the college of law. Faculty members at the university were encouraged to integrate gamification into education, as it helps students retain information more effectively and engage more actively with the lesson.

These previously examined studies had similar findings; most participants, in different disciplines and various countries, had optimistic perceptions of the gamification in education approach, while a smaller percentage had undesirable perceptions. However, positive results were not conveyed in all studies. Some studies found that a specific type of gamification might negatively affect students' learning and perception. For instance, Kwon and Özpolat (2020) examined the effects of gamifying assessment-related activities e.g., quizzes, class participation, and team projects within an undergraduate operations and supply chain management course. A total of 62 undergraduate students participated in the study, with enrollment split into two sections: 33 students in the experimental (gamified) group and 29 in the control (non-gamified) group. Contrary to expectations, results showed that assessment gamification led to significantly lower student satisfaction, perceived course experience, and content knowledge.

Gamification has increasingly been recognized as an effective strategy in higher education for boosting student engagement, motivation, and learning across different subjects and instructional formats. Commonly used elements include points, badges, levels, and feedback, while more advanced features like quests and time limits yield varied student responses. Overall, students tend to view gamification positively, especially when it encourages interaction and cognitive involvement. However, research also highlights that gamification can have adverse effects if not thoughtfully designed, particularly when applied narrowly. Within this framework, the current study investigates university students' perceptions of gamification in an educational technology course, offering insights from the Kuwaiti context, where there is a shortage of research studies that address the use of gamification in Kuwaiti higher education.

METHOD

This study employed a descriptive exploratory mixed-methods approach using a one-group pre-post design to investigate university students' perceptions of gamification in an educational technology course.

The current study collected quantitative and qualitative data at two points to gain deeper insight into students' perceptions. Data were collected from participants before using gamification. The data were collected through a questionnaire that included both closed-ended and open-ended questions. After the first round of data collection, gamification was introduced as an instructional strategy for three weeks. After that, a second round of data collection was conducted using the same questionnaire instrument. Using a questionnaire that combined closed-ended and open-ended questions contributed to a comprehensive exploration of the various dimensions of the phenomenon under investigation.

Participants

All the students in the "introduction to educational technology" class were invited to participate in the current study. This class was offered for female students in the college of basic education at a university in Kuwait in the second semester of 2024\2025 academic year. The great majority of the participants were in their first academic year. The number of students in this class was 50. The number of participants in the first round of data collection was 46. The number of participants in the second round of data collection was 42. The slight drop in participants in the second round could be attributed to absenteeism, scheduling conflicts, or reduced motivation.

Instruments

The data were collected through a questionnaire that included both closed-ended and open-ended questions. The questionnaire aimed at examining participants' perceptions of the use of gamification in education. The questions in the questionnaire used a five-point Likert-type scale. The closed-ended questions were distributed over seven dimensions developed based on the previous studies (e.g., Alsawaier, 2018; Alshammari, 2019; Etfita et al., 2023; Hanus & Fox, 2015; Huang et al., 2019; van Roy & Zaman, 2017; Vanduhe et al., 2020). The number of questionnaire items was 35. These dimensions were engagement and motivation, which examines students' interest and enthusiasm driven by elements like points and badges; preference and ease of use, which reflects their favorability toward gamified features and how easy they find them to use; learning effectiveness, which

Table 1. The open-ended questions in the questionnaire

No	Questions
1	Would using gamification elements in the educational process be beneficial? Why or why not?
2	What would you like most about using gamification elements in the educational process?
3	What is the thing you would not like about using gamification elements in the educational process?
4	What are the advantages of using gamification elements in the educational process?
5	What are the disadvantages of using gamification elements in the educational process?

Table 2. Summary of reliability analysis

Dimension	Number of dimension items	Cronbach's alpha	
		Study, round one (N = 46)	Study, round two (N = 42)
Engagement and motivation	5	0.85	0.94
Preference and ease of use	5	0.83	0.92
Learning effectiveness	5	0.82	0.88
Interactivity	5	0.81	0.83
Time and effort	5	0.81	0.81
Doubts	5	0.88	0.85
Expectations and excitement	5	0.86	0.92

assesses beliefs about the impact of gamification on understanding, skills, and creativity; interactivity, which focuses on the extent to which gamification promotes interaction with peers and content; time and effort, which explores students' views on how gamification affects their time management and required learning effort; doubts, which captures concerns about potential distractions or reduced seriousness; and expectations and excitement, which gauges students' anticipation and eagerness to engage in gamified educational activities. The questions employed to gather data on participants' perceptions of the use of gamification in education in the second questionnaire consisted of the same items as in the first questionnaire. The open-ended questions in the questionnaire were developed based on the purpose of the study. Five of the open-ended questions related to students' perceptions of gamification in education. **Table 1** shows the open-ended questions in the questionnaire.

A panel of experts evaluated the questionnaire instrument to ensure its validity. They were experts in educational science from different universities in two Arab countries. The questionnaire was revised based on their comments. Cronbach's alpha was used as an indicator of the reliability of the questionnaire's closed-ended questions. Cronbach's alpha coefficients were calculated from the two rounds of the questionnaire. **Table 2** presents the reliability analysis results, indicating that all Cronbach's alpha values exceeded the acceptable threshold.

Study Settings and Procedure

The study took place in the second semester of the 2024/2025 academic year. It took place in the course "introduction to educational technology," a compulsory theoretical course offered to students in the college of basic education. The course is theory-based and focuses on foundational concepts in educational technology. Gamification was integrated into the theoretical component of the course. Two main digital tools, Kahoot and Educaplay, were employed in this study during classroom sessions to reinforce students' understanding of theoretical concepts and to assess their comprehension in an interactive and engaging manner. The use of these tools was guided by a theoretical framework integrating SDT, behaviorism, constructivism, and flow theory. Together, these theories emphasize enhancing motivation, engagement, and learning through fulfilling psychological needs that include autonomy, competence, and relatedness, reinforcing desired behaviors, supporting active knowledge construction, and maintaining optimal challenge. Gamification applies these principles by offering choice, feedback, rewards, collaboration, and progressively challenging tasks tailored to learners' needs. The participation in the study was voluntary. Before introducing gamification as an instructional strategy, participants were asked to complete a questionnaire to measure their perceptions of the use of gamification in education. After that, the gamification approach was introduced as an instructional strategy. The use of gamification lasted for three weeks. Then, the second questionnaire was administered to measure students' perceptions of gamification.

Data Analysis

Data analysis was conducted over two rounds. The first round analyzed results from the first questionnaire, while the second one comprised an analysis of the second set of questionnaires. Analysis of questionnaire data included descriptive analysis and comparison of Ms for students' responses to the closed-ended questions and qualitative thematic analysis for open-ended questions. Descriptive statistics, including means (Ms) and standard deviations (SDs), were calculated to evaluate participants' perceptions of gamification in

education. Mann-Whitney U tests were performed to compare participants' perceptions of gamification prior to and following their direct experience with it. This non-parametric test was appropriate given the possible non-normal distribution and small sample size. Qualitative data analysis, specifically thematic analysis, was employed to examine students' responses to the open-ended questions.

RESULTS AND DISCUSSION

Findings From the Questionnaire's Closed-Ended Questions

Students' perceptions of using gamification in their education were measured before and after a three-week gamification intervention. Descriptive statistics, including Ms and SDs, were used to describe students' perceptions of gamification. Students' perceptions of gamification were categorized under six dimensions: engagement and motivation, preference and ease of use, learning effectiveness, interactivity, time and effort, doubts, and expectations and excitement. To compare the students' perceptions of using gamification in their learning before and after these three weeks' interventions, Mann-Whitney U tests were conducted on pre-test and post-test data collected from the two groups.

Table 3 shows descriptive statistics and the Mann-Whitney U test results. The items presented were included in the first round of data collection. However, these items were rephrased in the second round to convey the same ideas using different verb tenses.

In the first round of data collection, participants reported high and positive perceptions of using

Table 3. Descriptive statistics and Mann-Whitney U test results assessing differences in participants' perceptions of gamification before and after a three-week intervention

No	Item	PRT-46		POT-42		MWU	AS2
		M	SD	M	SD		
1	I believe I will enjoy using interactive elements such as points and badges in learning.	4.26	.74	4.40	.73	852.0	.291
2	I believe that interactive games and rewards will make me more motivated to learn.	4.59	.75	4.50	.77	910.0	.565
3	I would like to take courses that include gamification elements.	4.15	.70	4.26	.77	878.0	.423
4	I will encourage other students to try courses that include gamification.	4.22	.76	4.48	.67	786.0	.099
5	I believe that courses using gamification will make me more passionate about the subject matter.	4.30	.84	4.21	.87	909.5	.608
Overall engagement and motivation		4.30	.60	4.37	.68	861.0	.373
6	I believe that having a reward or challenge system similar to games will make learning more enjoyable.	4.59	.65	4.45	.67	854.0	.279
7	I prefer having competitive elements like prizes and points during learning.	4.26	.91	4.24	.79	922.0	.690
8	I believe that participating in interactive challenges will motivate me to continue learning.	4.33	.82	4.26	.80	912.5	.625
9	I would appreciate it if the course material included interactive activities based on gamification.	4.22	.70	4.31	.81	871.5	.391
10	I believe that educational systems with interactive design make learning easier and more exciting.	4.41	.78	4.26	.80	855.5	.308
Overall preference and ease of use		4.36	.60	4.30	.68	939.5	.822
11	I believe that gamification makes learning more effective compared to traditional methods.	4.33	.76	4.21	.72	864.5	.352
12	I believe that gamified activities will significantly enhance my understanding of the subject.	4.33	.79	4.19	.94	906.0	.586
13	I believe that points and rewards will help me track my performance and improve my skills.	4.33	.84	4.36	.69	949.0	.876
14	I believe that interactive challenges in the classroom will help me learn better.	4.37	.64	4.17	.88	864.0	.352
15	I believe that using gamification enhances creative thinking during learning.	4.20	.86	4.38	.66	876.0	.410
Overall learning effectiveness		4.31	.60	4.26	.65	943.0	.846
16	I believe that gamification makes the learning process more interactive compared to traditional methods.	4.26	.77	4.29	.74	956.0	.928
17	I believe that having competitive activities will increase my interaction with my peers.	4.37	.68	4.21	.92	908.0	.596
18	I believe that team discussions within gamified contexts will help me learn.	4.09	.76	4.36	.69	778.5	.088
19	I believe that using gamification encourages continuous interaction inside and outside the classroom.	4.17	.80	4.14	.93	958.0	.943
20	I believe that exercises based on gamification make participation in learning activities more dynamic.	3.96	.79	4.05	.91	891.5	.505
Overall interactivity		4.17	.57	4.21	.66	897.0	.559
21	I believe I will spend more time following learning activities due to gamification.	3.72	1.00	3.67	1.12	960.5	.962

Table 3 (Continued). Descriptive statistics and Mann-Whitney U test results assessing differences in participants' perceptions of gamification before and after a three-week intervention

No	Item	PRT-46		POT-42		MWU	AS2
		M	SD	M	SD		
22	I believe that gamification will make time management during study more efficient.	3.89	.99	4.00	.86	925.5	.722
23	I believe that gamified activities require greater effort but offer higher educational benefits.	3.87	.83	4.05	.82	854.0	.320
24	I believe that using gamification makes time management during learning more organized.	3.89	.97	4.05	.82	894.5	.528
25	I believe that guided activities using gamification help achieve learning goals faster.	4.02	.80	4.14	.84	875.0	.412
Overall time and effort		3.88	.70	3.98	.68	876.0	.450
26	I do not believe that points and badges are important to motivate me to learn.	2.52	1.15	2.60	1.23	930.0	.753
27	I do not think I will be interested in competing with my classmates in a gamified context.	2.46	1.05	2.50	1.29	961.5	.969
28	I believe gamification might distract me from the core objectives of the subject.	2.59	1.15	2.52	1.11	952.0	.904
29	I believe that gamification elements can be exaggerated at the expense of educational content.	3.07	1.06	2.76	1.12	829.0	.235
30	I believe gamification may make learning seem less serious.	2.91	1.19	2.83	1.15	920.0	.692
Overall doubts		2.71	.91	2.64	.94	947.0	.874
31	I am excited to try courses that include gamified activities.	3.93	.68	4.00	.91	885.5	.460
32	I believe I will enjoy participating in interactive challenges.	4.07	.68	4.19	.80	858.0	.322
33	I believe that gamified interactive activities will make my learning more interesting.	4.02	.65	4.29	.71	768.0	.061
34	I believe that incorporating gamification into learning will make the educational process more exciting.	4.15	.70	4.21	.72	917.5	.659
35	I believe gamification will increase my enthusiasm and readiness to participate in classroom activities.	4.20	.78	4.31	.78	885.0	.464
Overall expectations and excitement		4.07	.56	4.20	.69	823.0	.227

Note. PRT-46: Pre-test (N = 46); POT-42: Post-test (N = 42); M: Mean; SD: Standard deviation; MWU: Mann-Whitney U test; AS2: Asymptotic significance (2-tailed); & 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, & 5 = Strongly agree

gamification in learning, with five pre-test items exceeding 4.00 on a five-point Likert scale. The highest pre-test M was observed for the preference and ease of use dimension (M = 4.36, SD = .60), followed by engagement and motivation, learning effectiveness, interactivity, and expectations and excitement. The findings suggest that participants felt the gamification would be easy to follow and they had positive perceptions of the role of gamification in enhancing their learning experience, increasing their motivation, and making the learning process more enjoyable. The time and effort dimension showed a moderate M score (M = 3.88, SD = .70), indicating general agreement that gamification could improve productivity. In contrast, the doubts dimension recorded the lowest pre-test M (M = 2.71, SD = .91), reflecting low levels of concern about gamification being distracting or reducing academic seriousness.

Like the first round of data collection, the participants had high and positive perceptions of using gamification in learning. In the second round, five pre-test items exceeded 4.00 on a five-point Likert scale. However, the engagement and motivation dimension emerged as the highest-rated dimension (M = 4.37, SD = .68), followed by preference and ease of use, learning effectiveness, interactivity, and expectations and excitement. The results indicated that a gamified learning experience successfully captured students' enthusiasm. In addition, the results reflected the continued belief that gamification could enhance understanding, increase interaction, and create an enjoyable learning atmosphere. The time and effort dimension remained moderate across both rounds, slightly increasing from the first round (M = 3.88, SD = .70) to the second (M = 3.98, SD = .68), suggesting growing agreement that gamification supports better time use. Doubts dimension decreased slightly (M = 2.64, SD = .94), reinforcing that participants had minimal concern about gamification being distracting or academically unserious.

The Mann-Whitney U test results showed no significant changes in students' perceptions of gamification after they had experienced it. There were no statistically significant differences in students' responses to any of the items related to the dimensions of gamification. However, a few items approached significance. For instance, item 4, which stated: "I will encourage other students to try courses that include gamification" (p = .099), showed an increase from (M = 4.22, SD = .76) in the pre-test to (M = 4.48, SD = .67) in the post-test. Item 18, which stated "I believe that team discussions within gamified contexts will help me learn" (p = .088), also showed a positive shift, with pre- and post-test Ms of (M = 4.09, SD = .76) and (M = 4.36, SD = .69), respectively. The strongest trend toward significance was observed in item 33, that stated "I believe that gamified interactive activities will make my

learning more interesting" ($p = .061$), which rose from ($M = 4.02$, $SD = .65$ to $M = 4.29$, $SD = .71$). These findings suggest an emerging trend toward stronger enthusiasm for recommending gamified learning, participating in collaborative gamified activities, and increased engagement with interactive features, even though these differences did not reach statistical significance. These findings suggest that while the intervention did not lead to significant statistical changes, participants' already favorable perceptions of gamification were slightly reinforced through their exposure to the gamified learning environment.

The positive perceptions of gamification in education reported by most participants in this study are consistent with findings from previous research (Aguilos & Fuchs, 2022; Alabbasi, 2017; Etfita et al., 2023; Garcia-Iruela & Hijón-Neira, 2020; Nyazi, 2023; Rajšp et al., 2017). Participants' responses to the questionnaires indicated that their perceptions of the gamified instructional approach were positive and remained positive after its implementation. One possible explanation is that participants began with strong optimism about the benefits of gamification, and their experience reinforced these initial beliefs. However, the relatively short duration of exposure, which was three weeks, may not have been sufficient to produce statistically significant changes in their overall attitudes. Therefore, to better understand how perceptions of gamification evolve, future studies should consider implementing gamified learning over an extended period and examining its sustained impact on learner motivation and engagement.

Findings From the Questionnaire's Open-Ended Questions

In their response regarding the usefulness of gamification in education, most of the students in the first round of data collection (43 out of 46) reported that they believed it would be useful.

In contrast, two students reported a neutral answer, saying they did not know. Only one student reported a negative answer regarding using gamification in education. In the second round, all the students, except for one, reported a positive perception of gamification's usefulness in education. The rest of the students' responses to the open-ended questions in the questionnaire were generally categorized into two primary themes: perceived advantages and perceived issues. These themes reflected the most common patterns in participants' sentences and provided a clear framework for analyzing their qualitative feedback on using gamification in the educational process.

Perceived Advantages of the Use of Gamification in Education

In the first round of data collection, students shared their perceptions of gamification in education based on their expectations or past experiences rather than actual experience during the course in which the study took place. The first round of data collection was conducted before the implementation of gamification. However, the students were familiar with gamification, as the instructor explained before the initial round of data collection. The students reported several advantages of the use of gamification in education. After analyzing students' responses to the open-ended question, the perceived advantages were categorized into four groups: motivational and behavioral advantages, cognitive and educational advantages, social and collaborative advantages, and technological and organizational advantages (see **Figure 1**).

The motivational and behavioral advantages were expressed in different aspects. Students reported that using gamification in their education would increase their motivation and enthusiasm. For instance, one student stated, "the use of gamification in my education would enhance my learning passion, motivate me to learn". In addition, students reported that gamification would enhance enjoyment and positive emotions. One of the students stated that "gamification is exciting, challenging, and entertaining, no boredom". Furthermore, students believed using gamification in their learning would break psychological barriers. One student reported, "gamification would contribute to overcoming fear, becoming bolder, and avoiding sluggishness."

The cognitive and educational benefits were evident in students' responses. They indicated that gamification improves understanding and helps retain information. One student noted, "it makes the content easier to understand and remember." Additionally, students shared that gamification stimulates the mind and boosts focus. One student said, "it helps me stay focused and mentally active." Moreover, they believed it encourages self-learning and critical thinking. A student stated, "it supports critical thinking and problem-solving."

The social and collaborative advantages were reflected in various aspects of students' responses. Students indicated that gamification would enhance their interaction and participation during lessons. One student shared, "gamification helps me participate more and interact actively with my classmates through group activities." In addition, students believed that gamification would promote teamwork and collaboration. For example, a student mentioned, "I like working in groups; it builds the spirit of cooperation and makes us support each other." Furthermore, students highlighted that gamification encourages positive competition among peers. One of the students

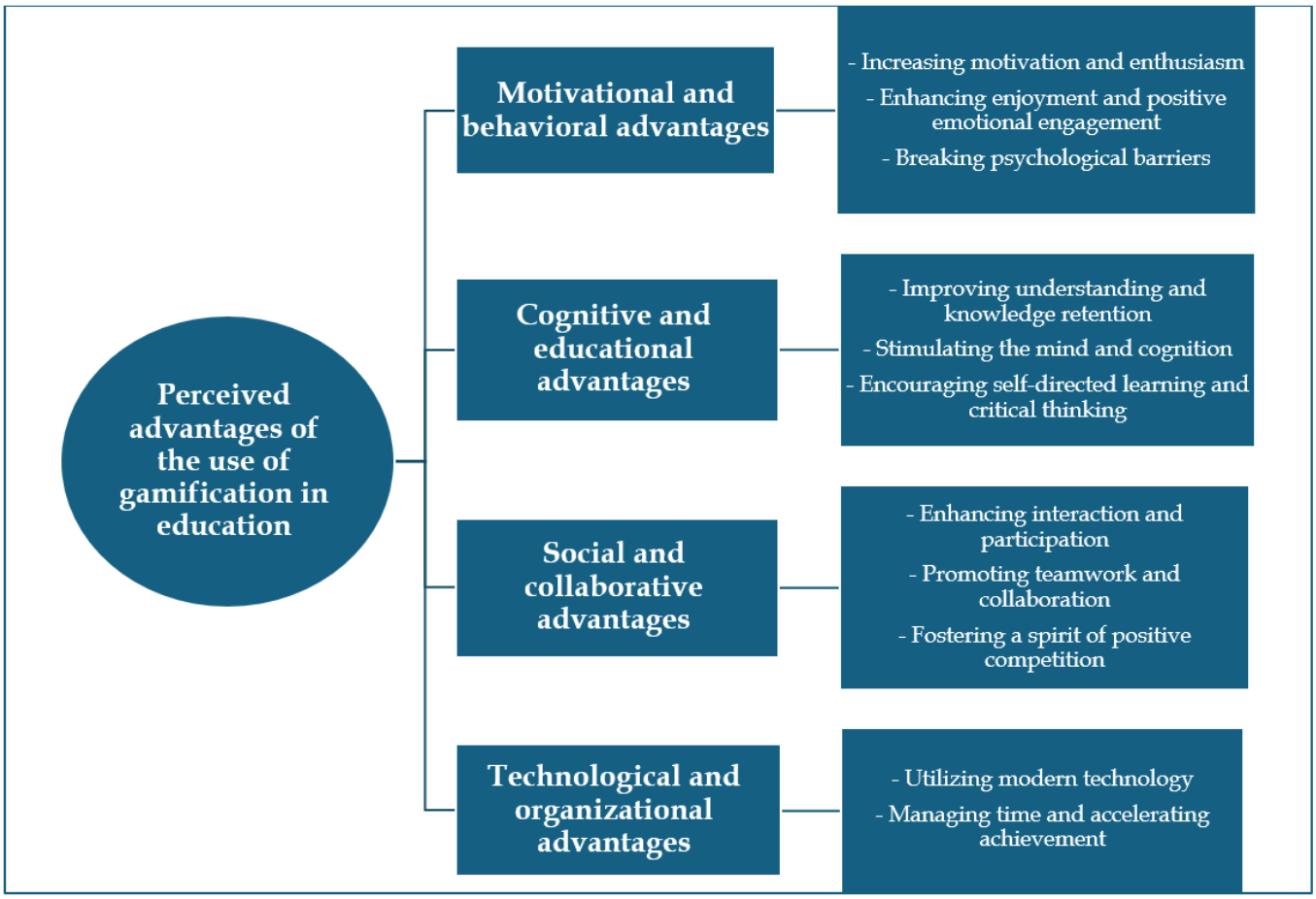

Figure 1. Perceived advantages of the use of gamification in education (Source: Authors' own elaboration)

explained, "the challenges and collecting points in gamified activities make me more competitive and eager to do better."

The students also highlighted the technological and organizational benefits. They noted that gamification allows modern technology to engage them in learning. One student remarked, "using devices and digital games makes learning more interesting." Additionally, students pointed out that gamification helps manage time and speed up achievement. One student said, "it saves time and helps deliver learning goals faster."

Like the first round of data collection, students reported several perceived advantages of using gamification in education. Again, these advantages were categorized into four main groups: motivational and behavioral advantages, cognitive and educational advantages, social and collaborative advantages, and technological and organizational advantages. However, in the second round, students emphasized motivational aspects such as enjoyment, rewards, and increased enthusiasm for learning. There was also a noticeable increase in reference to time-saving and ease of learning, reflecting a stronger perception of organizational benefits. In contrast, themes related to self-directed learning and modern technology appeared less frequently than in the first round, suggesting a slight shift in focus from individual cognitive development and technological engagement to immediate classroom engagement and enjoyment. The positive perceptions of gamification in education reported by most participants in this study are consistent with findings from previous research (Aguilos & Fuchs, 2022; Alabbasi, 2017; Etfita et al., 2023; Garcia-Iruela & Hijón-Neira, 2020; Nyazi, 2023; Rajšp et al., 2017).

Perceived Issues of the Use of Gamification in Education

In the first round of data collection, students reported several issues related to using gamification in education. After analyzing their responses to the open-ended questions, the perceived issues were categorized into four main groups: Classroom disruption and management challenges, educational challenges and reduced seriousness, negative competition and emotional drawbacks, and technical and time-related constraints (see **Figure 2**).

Classroom disruption and management issues were among the anticipated concerns reported by students. They expected that gamification might increase noise and a lack of discipline during lessons. For instance, one student predicted, "it might cause a lot of noise and chaos in the classroom", while another noted, "students may participate randomly and create confusion." Students also believed that classroom control could

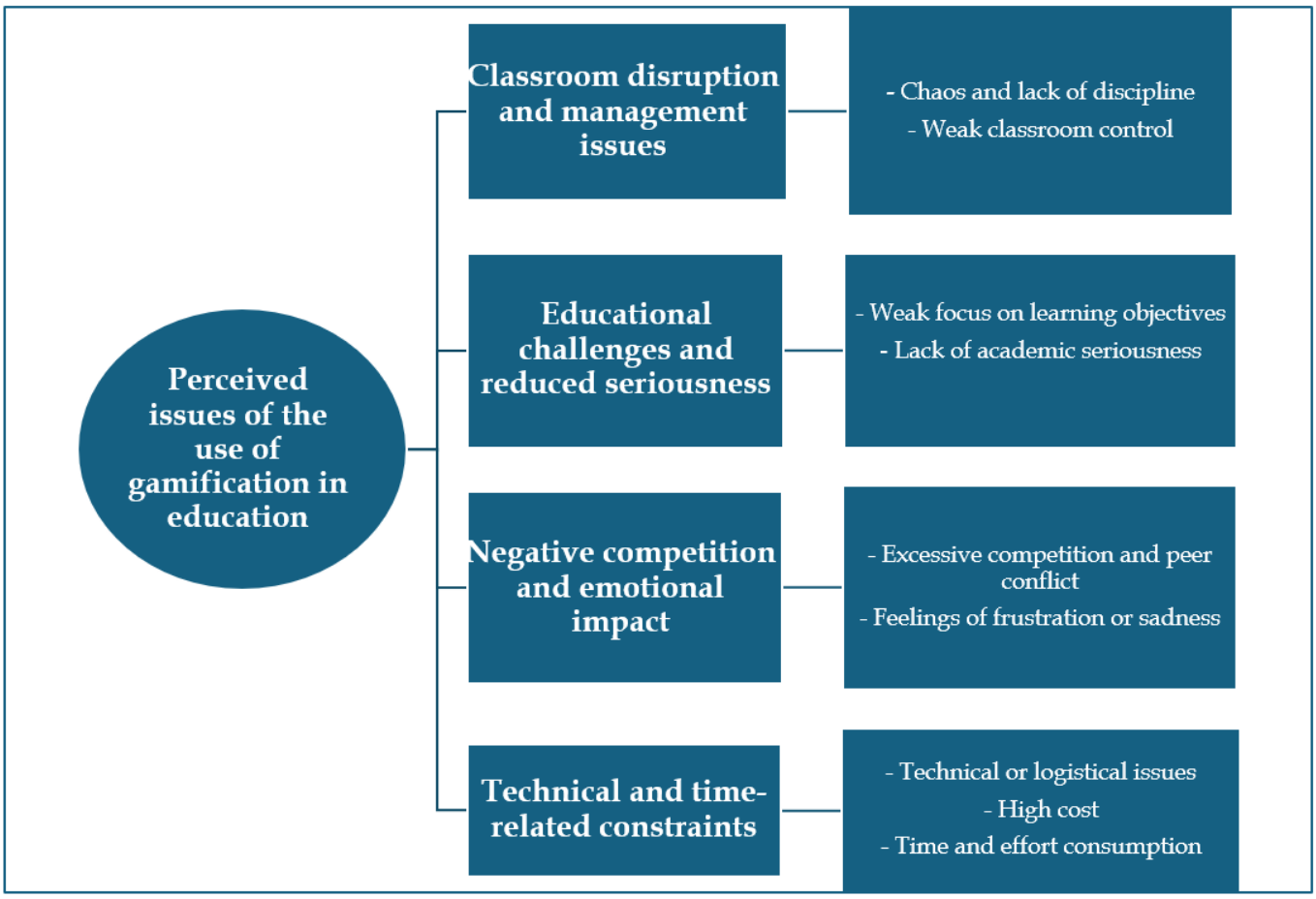

Figure 2. Perceived advantages of the use of gamification in education (Source: Authors' own elaboration)

become more difficult for teachers when games are involved. As one student mentioned, "the noise could get out of control, and the teacher might struggle to manage the class."

Educational challenges and reduced seriousness were also anticipated by students. They expressed concern that gamification might divert attention from the core learning objectives to the act of winning or earning points. One student stated, "I think I might care more about collecting points than understanding the lesson", and another added, "there is a risk I will forget the actual content because I will be too focused on the game." Some students also expected that gamification could reduce the academic seriousness of learning. As one explained, "it might turn the class into just fun and games, not serious study", while another believed, "Some games might not even relate to the material."

Negative competition and emotional impact were frequently anticipated by students in their responses. They expected that gamified activities could encourage excessive competition, potentially leading to conflict or negative feelings among classmates. One student wrote, "it could cause arguments or bad feelings between students who are too competitive", and another predicted, "some students might feel resentment or jealousy if others keep winning." Emotional effects were also a concern, with students fearing that repeated loss or failure in games might be discouraging. For example, one student said, "I might feel disappointed if I do not win," and another shared, "losing might affect my confidence."

Students also anticipated technical and time-related constraints as potential drawbacks. They expected technical issues, such as device malfunctions or internet failures, could disrupt gamified activities. One student anticipated, "the game might stop if the internet disconnects", while another noted, "sometimes devices might not work properly." Others were concerned about the high cost of implementing gamification. A student stated, "it might require expensive devices that not all students have." Time and effort were also noted, as students predicted that gamified activities might consume too much time or require extensive preparation. One student remarked, "it could waste class time", and another added, "preparing games might take too much effort from the teacher."

Like the first round of data collection, the issues raised by students in the second round can be categorized into the same four main groups: Classroom disruption and management challenges, educational challenges and reduced seriousness, negative competition and emotional drawbacks, and technical and time-related constraints. However, in contrast, the second round of responses showed a slightly more

balanced view, for instance. At the same time, concerns about distraction, excessive focus on rewards, and classroom disruption remained; they were mentioned with less intensity and frequency. Some students still reported worries about technical issues like internet failure or program glitches; others noted that competitive dynamics might demotivate students who fail. However, several participants in the second round stated that they saw no major disadvantages or expressed confidence that the challenges could be managed if gamification were implemented thoughtfully. While the first round reflected cautious and critical expectations, the second round suggested growing acceptance of gamification, with continued but moderate concerns. These findings regarding the associated concerns of using gamification in education repeat Kwon and Özpolat's (2020) caution that poorly designed gamification can lead to unintended negative outcomes, such as reduced student satisfaction, lower perceived learning gains, and diminished course engagement. In addition, the findings regarding the technical constraints as potential drawbacks of the use of gamification aligned with Susanto's (2025) findings, who reported that technical challenges were identified as a limitation, negatively impacting the gaming platform's overall efficiency, mainly those relating to a stable internet connection.

CONCLUSIONS AND RECOMMENDATIONS

The results of this study revealed that most students held positive perceptions toward the use of gamification in education, both before and after the three-week intervention. Quantitative data from pre- and post-questionnaires indicated high scores across key dimensions such as engagement, motivation, ease of use, learning effectiveness, and interactivity. While the Mann-Whitney U tests showed no statistically significant changes between pre- and post-intervention responses, several items demonstrated positive trends, suggesting that students' initial enthusiasm for gamified learning was reinforced through their experience. Qualitative findings further supported this, with students emphasizing motivational, cognitive, social, and organizational benefits. However, some concerns were raised, including issues related to classroom disruption, excessive competition, and technical or time-related challenges.

Based on these findings, several recommendations are proposed for higher education institutions and faculty members to enhance the implementation of gamification. Gamification should be incorporated into theory-based courses to increase engagement and comprehension of abstract content. Institutions should provide students with orientation on how to use gamified tools effectively and support them in managing competitive dynamics and time demands. Instructors should align game elements with learning objectives, ensure a balance between competition and collaboration, and maintain classroom structure. Additionally, activities should be designed with appropriate levels of challenge and timely feedback. Faculty training and professional development in gamification strategies are essential, and institutions should embed gamification into their broader teaching and learning policies. Furthermore, based on students' concerns expressed in their responses to the open-ended questions, faculty members who are interested in using gamification in education should consider using clear classroom management strategies, designing thoughtful gamified tasks that would avoid distraction, reducing negative competition, and using collaborative activities and supportive feedback. Technical issues can be addressed by ensuring infrastructure readiness and using accessible, low-cost tools. Finally, gamified tasks should be time-efficient.

Future research should examine the perspectives of other stakeholders, including instructors and administrators, to gain a more comprehensive understanding of gamification's institutional impact. Longitudinal studies are also needed to explore the long-term effects of gamification on student motivation, performance, and learning retention. Additionally, future research should investigate the impact of specific gamification elements such as points, badges, leaderboards, challenges, and feedback mechanisms on different learning outcomes and student experiences. Understanding which elements are most effective, for whom, and in what contexts will help refine the design of gamified learning environments and ensure their alignment with instructional goals. Expanding the research to include larger and more diverse participant samples across disciplines and educational settings would further enhance the generalizability of findings and support the development of targeted, evidence-based strategies for integrating gamification in higher education.

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Ethical statement: The authors stated that this study did not require formal ethical approval. The study did not involve any clinical interventions, experiments, or sensitive personal data, and posed no potential risk of physical or psychological harm to participants.. The research involved adult university students who voluntarily participated by completing questionnaires over two rounds, with no physical procedures or collection of sensitive personal data. The authors further state that informed consent was obtained from all participants and confidentiality of the data was ensured.

AI statement: The authors stated that generative AI tools (e.g., ChatGPT by OpenAI) and AI-based grammar checkers (e.g., Grammarly) were used to improve the English language clarity

and for proofreading purposes. All content was reviewed, verified, and finalized by the author. No content was generated by AI.

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