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Promoting Change: Traditional Model Versus Gamification in Physical Education Teacher Education

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Abstract

The aims of the study were to assess the impact of a pedagogical approach, gamification, in Physical Education Teacher Education (PETE) on students' satisfaction and on the perceptions of both students and professor after the experience. A total of 142 students (102 men, 40 women) aged between 19 and 41 years, with a mean age of 21.7 (*SD* = 2.5) enrolled in the Physical Activity and Sport Science degree at a public university agreed to participate. The study involved two groups: one following a traditional instructional approach (*n* = 64) and the other using a gamification approach (*n* = 78). A mixed methods design was employed, using a Student Satisfaction Questionnaire for quantitative data collection, consisting of 20 items on a 5-point Likert scale. For qualitative analysis, an individual videoreflection protocol was established, with each video recorded and submitted electronically via the virtual campus to ensure confidentiality. Within this framework, the participating professor completed a self-administered journal at the end of each week, while the students answered the questionnaire and recorded their video reflections at the end of the program. The quantitative results showed increased student satisfaction, which in turn promoted learning. Comparative analysis of the qualitative data revealed a consensus between students and the teacher regarding three positive themes: gamification, values, and academic learning; however, a negative aspect—high workload—was identified solely by the teacher. In conclusion, gamification constitutes an effective pedagogical approach in initial Physical Education Teacher Education, as it enhances student satisfaction and facilitates academic learning. However, its implementation requires acknowledging the increased workload for teaching staff as a necessary condition for success.

Keywords: active methodologies, educational technology, higher education, information and communication technologies, physical education didactics, sports pedagogy, tertiary education

Introduction

Student motivation is a key element in any educational context, and higher education is no exception, where higher levels of motivation have been linked to better academic performance (Morris & Usher, 2011). Unfortunately, there is a high degree of amotivation among college students, caused at least partially by traditional, highly controlling, teacher-centered methodological approaches (Vermote et al., 2020). To address this negative trend, the Integrative Model for Teacher Change (Kern et al., 2020) highlights the need for a framework to design reform-oriented initiatives, such as changes in teachers' pedagogical practices (e.g. resources, teaching strategies, assessment). Within this model, individuals are perceived as dynamic agents of their own change (Richards et al., 2019), but they need frameworks that empower them.

Gamification has been defined as the use of game elements in non-game contexts to make them more attractive, enjoyable, and motivating (Deterding et al., 2011). Kapp (2012) understands it as the use of game mechanics and game-thinking to capture people's attention and encourage action, thereby promoting learning and problem-solving. In the educational context, Codish and Ravid (2014) highlighted that gamification is based on the inclusion of game elements in classrooms, training materials, and learning management systems. The use of points, badges and leaderboards is the most commonly used gaming mechanics (Werbach & Hunter, 2012), but many other elements have also been used to design gamified systems, such as progress bars, performance graphs, quests, meaningful stories, avatars, profile development and teammates (Sailer et al., 2017).

In this context, several studies have analyzed the impact of gamification-based teaching on the training of university students (Alajaji & Alshwiah, 2021; Arufe et al., 2022) and more specifically, on future Physical Education teachers, enrolled in degree programs in Primary Education and Physical Activity and Sport Sciences. Regarding the former, research has shown that this methodological strategy is attractive (Pérez-López et al., 2017) and promotes student autonomy (Valero-Valenzuela et al., 2020) and motivation (Pérez-López & Rivera-García, 2017; Flores-Aguilar et al., 2023), leading to greater engagement in learning (Alajaji & Alshwiah, 2021; Arufe et al., 2022). Focusing on the Physical Activity and Sport Sciences undergraduate degree, Pérez-López and Rivera-García (2017) and Pérez-López et al. (2017) described successful experiences in which students increased their motivation, reported satisfaction with the class climate and their learning, increased their competencies, and believed they could transfer these to their future professional practice.

Based on the aforementioned evidence, the primary aim of the present study was to assess the impact of a gamified pedagogical approach, compared with a traditional instructional model, on the satisfaction levels of Physical Education Teacher Education students, specifically regarding their perceptions of the learning process and the relevance of the activities. The second aim was to analyze, from a qualitative perspective, the lived experiences and critical reflections of both students and the professor following the first implementation of gamification in this educational context.

Material and Methods

Participants

A total of 142 students (102 men, 40 women; M = 21.7, SD = 2.5) enrolled in the second year of the Physical Activity and Sport Science undergraduate program at a public university in southeastern Spain agreed to participate. The study involved two academic years: (a) 2017–18, in which 64 students experienced a traditional instructional approach, including 47 men (73.4%), and 17 women (26.6%), and (b) 2018–19, in which 78 students experienced a gamified approach, including 56 men (71.8%), and 22 women (28.2%), (this approach was totally new to them). Both programs are described in detail below. Convenience sampling was used because the same teacher, with more than 15 years of experience in Physical Education and Sport pedagogy, conducted both intervention programs and agreed to participate in the study. He received training in this pedagogical approach, as this was his first time implementing it.

Design and Procedure

The study followed a mixed methods research design (Anguera et al., 2012), integrating a quasi-experimental approach with nonequivalent groups (quantitative) and phenomenological analysis (qualitative). This methodological structure enabled data triangulation, where findings from the student questionnaires were contrasted with participants' video reflections to provide a comprehensive understanding of the intervention. First, approval to conduct the study was obtained from the University of Murcia Ethics Committee (ID: 2912/2018). Second, all participants completed the same program to develop Athletics' content knowledge and pedagogical content knowledge (e.g., history, basic rules, basic skills, progressions, techniques). In accordance with McMillan and Schumacher (2001), the project complied with the ethical values required for research involving human beings, and all participants provided written informed consent.

Intervention Program

Athletics is one of the compulsory subjects in the Physical Activity and Sport Science undergraduate program. It is taught over four months during the first semester of each academic year. Each week, students attend one hour of theoretical instruction and one hour of practical sessions (the latter in small groups of 20 students). Students were taught using either a traditional or a gamification approach in both theoretical and practical sessions. The main aim was to develop future teachers' athletics content knowledge and pedagogical content knowledge.

In particular, the objective of this course was to provide students with foundational technical, regulatory, and pedagogical knowledge of athletics, enabling them to effectively teach running, jumping, and throwing events through inclusive, educational, and evidence-based methodologies. The course covers the historical, technical, and pedagogical foundations of athletics, including the teaching and learning processes of track and field events, the use of facilities and equipment, and the adaptation of activities to diverse educational contexts and participant needs. Learning is structured through a combination of theoretical-practical lectures, on-track practical sessions, independent and collaborative tasks focused on technical analysis and instructional design, and continuous assessment through examinations, projects, and active participation.

In the 2017–18 academic year, a traditional instructional approach was implemented (Metzler, 2005), in which the teacher was the center of the learning process, making all decisions regarding task selection, pacing, and grouping. Teaching strategies positioned students as mere recipients and they did not address any dimension beyond cognitive and motor skills. The teacher used the command style to facilitate student learning and performance reproduction, the practice style in which students engaged in individual and private practice, and the reciprocal style in which students worked in partnership to support learning (Mosston & Ashworth, 2010). Students' content knowledge and pedagogical content knowledge were assessed throughout the course using apps and at the end through a final written examination.

In the 2018–19 academic year, the course was implemented through a gamified, student-centered approach entitled "Ludotechnicals' Rebellion", structured around a narrative in which students were challenged to become "Ludomasters" and teach athletics in physical education settings to promote a healthy lifestyle and positive values. The project included the three basic pillars of gamification previously introduced: dynamics, mechanics, and components (Werbach & Hunter, 2012), as well as key elements for creating a gamified context (Fernández-Río et al., 2020): (a) a powerful narrative: the *Hunger Games* plot was used to motivate students; a well-known, attractive story that was easy to adapt, in which students had to "defeat the villains" to earn points and become "Ludomasters" at the end of the semester (highest rank and highest qualification). In this system, the highest rank ("Ludomaster") corresponded to the highest possible course grade. However, points and ranks were aligned with the completion and quality of academic tasks and assessments (e.g., practical challenges, projects, and theoretical tests), ensuring that the gamified elements reflected students' actual learning and performance rather than functioning solely as a reward mechanism. (b) Challenging goals: students had several goals to achieve, linked to challenges and badges (e.g., beating a set time in a relay race or creating a video on the technical execution of hurdles); some tasks were performed individually and others in groups. (c) Mastery class climate: group and individual comparison were eliminated, and the teacher focused on personal or intragroup improvement. (d) Self-regulated learning: students paced themselves and decided which skills to perform; they knew in advance which tasks and challenges they had to complete to become "Ludomasters," and they decided when to perform them. (e) Immediate feedback: students received first-hand information about their performance to know if they needed to repeat a task to improve it; the teacher provided continuous feedback. (f) Visibly incremental success: tasks progressively increased in difficulty to support students success at the beginning, foster motivation, and encourage engagement with more difficult tasks and challenges towards the end. (g) Badges for achievements: the project incorporated badges that were awarded as physical credentials upon completion of specific tasks or learning milestones and served as formative indicators of progress and engagement. (h) Social connection: students worked in heterogeneous groups (based on sex and skill level) from the beginning of the semester to support one another's success. According to Gawrisch et al. (2020), Physical Education Teacher Education programs are encouraged to prepare teachers capable of delivering technology-integrated learning experiences. Therefore, following previously published studies (Mora-González et al., 2020), the program (Table 1) incorporated the use of information and communication technology (ICT) such as apps (e.g., Socrative, Kahoot, Edpuzzle, and Genially) and films (e.g., *The Hunger Games*, *Ready Player One*). The project finished with a Breakout EDU activity (Nicholson, 2018), in which students had to solve different problems related to athletics (e.g., long jump, shot put) integrating both content knowledge and pedagogical content knowledge (only in this academic year).

Table 1
Contents, Topics, Teaching Methodology and ICTs

Objectives	Contents	Topics	Teaching methodology				ICTs	
			Gamification approach			Traditional approach	GF	TA
			Components	Mechanics	Dynamics	Teaching strategies		
Acquiring foundational knowledge of athletics	Introduction: historical, rules and pedagogical foundations	Instructional framework	Points	Challenges, awards, feedback, competition, and cooperation *Challenge:* make playful proposals as trainee teachers	Narrative, emotions	Command style, practice style, reciprocal style	Kahoot, Google Forms, Genially, social media	Kahoot
Practicing and teaching the events associated with each discipline group	Runs	Running Relays Hurdles	Points, badges, levels, rankings	Challenges, awards, feedback, competition, and cooperation *Challenge:* analyze hurdle technique filmed with a high-speed video camera	Narrative, progression	Command style, practice style, reciprocal style	Kinovea, Kahoot, Edpuzzle, Socrative, Genially, Fluky	Kinovea, Edpuzzle, Socrative
	Jumps	Long jump High jump	Points, badges, jokers, totems, levels, rankings	Challenges, awards, feedback, competition, and cooperation *Challenge:* conduct a test on the technical elements of the High Jump	Narrative, discovery, unlocking challenges, progression	Command style, practice style, reciprocal style	Kinovea, Kahoot, Edpuzzle, Socrative, Genially, Fluky	Kinovea, Edpuzzle, Socrative
	Throws	Shot-put Javelin	Points, badges, jokers, totems, levels, rankings	Challenges, awards, feedback, competition, and cooperation *Challenge:* analyze the shot-put technique filmed with a high-speed video camera	Narrative, discovery, unlocking challenges, progression	Command style, practice style, reciprocal style	Kinovea, Kahoot, Edpuzzle, Socrative, Genially, Fluky	Kinovea, Edpuzzle, Socrative
Applying and adapting inclusive and educational methodologies	Ending: activities to diverse educational contexts and needs	Modification contests and activities	Points, rankings	Challenges, awards, competition, and cooperation *Challenge:* cover a distance overcoming several obstacles using the long jump, shot put, javelin throw, and sprint	Narrative, emotions, progression	Command style, practice style, reciprocal style; theoretical knowledge exam	Wallame, Genially, Google forms	-

Note. TA = Traditional approach; GF = Gamification framework; ICTs = Information and communication technologies.

Instruments

Student Satisfaction Questionnaire. This is a survey designed by the researchers of the Murcia University Quality Unit to assess students' satisfaction with the pedagogical approach. It is an original instrument that provides relevant data based on professional experience, although it has not undergone formal statistical validation. Trained external evaluators conduct it at the end of every semester during the last class session (before final grades are turned in). The aim is to obtain the students' views on the way the classes are designed and conducted. A total of 67 students completed the questionnaires. It includes 20 items grouped in three subscales: (a) students' sociometric characteristics (three items; e.g., age, gender), (b) professor satisfaction (12 items; e.g., "Tasks conducted during practical sessions are related to the information discussed in the theoretical sessions"), and (c) subject satisfaction (five items; e.g., "The class does not include topics discussed in other subjects"). Participants responded using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). It also includes a "no answer" option. Reliability coefficients were .94 for professor satisfaction and .65 for subject satisfaction. Overall student satisfaction had a reliability coefficient of .93.

Critical video reflection. At the end of the intervention, all students were invited to voluntarily participate in a video reflection activity, and nine agreed to contribute. Participation was not predetermined or selective, and the objective was to obtain rich, in-depth perspectives rather than a statistically representative sample. The number of participants was considered adequate once thematic saturation was reached and no new relevant themes emerged. They were asked to answer the following open-ended question: "Please try to recall what has happened in the course that you have just finished; how has it contributed to your Physical Education Teacher Education training?". Participants were instructed to record their responses in a distraction-free environment and submit them via the online campus platform. This visual method was selected to allow students to freely articulate their lived experiences, capturing nuances often lost in written surveys (Pink, 2007). Confidentiality was strictly guaranteed, and data were used solely for research purposes (Roulston, 2010). The aim was to foster a critical reflection on the intervention, allowing themes regarding positive or negative aspects of the training to emerge naturally (Cherrington & Loveridge, 2014; Curtner-Smith & Sofo, 2004).

Professor's diary. The university professor who conducted the intervention program completed an open-format diary (Hordvik et al., 2017). The teacher's diary was not anecdotal but followed a semi-structured protocol to ensure systematic data collection. Entries were made weekly, immediately after the lessons to minimize recall bias. The diary focused on three specific dimensions: (1) perceived student engagement and barriers to participation, (2) logistical and organizational challenges of the gamified approach compared with the traditional approach, and (3) instructor's emotional responses and critical reflections on the methodological implementation.

Data Analysis

Quantitative data (questionnaire responses and grades) were analyzed using IBM SPSS 24.0 software. The Shapiro-Wilk test showed that the data did not follow a normal distribution. Consequently, non-parametric statistics were used to assess differences between the 2018–19 (gamification approach) and 2017–18 (traditional approach) academic years: the Mann-Whitney U test. Cohen's *d* was used to determine effect sizes (0.2–0.5 = small, 0.5–0.8 = medium, ≥ 0.8 = large; Cohen, 1988).

Qualitative data (video reflections and diary entries) were analyzed using ATLAS.ti (v. 7.1.3) software for the qualitative analysis of large bodies of textual, graphical, audio, and video data (Morales-Sánchez et al., 2014) following a systematic deductive-inductive procedure. The analysis was structured in three hierarchical levels: 1. Textual level (quotes): identification of meaningful extracts ($n = 121$) from the primary documents. 2. Conceptual level (nodes/codes): grouping of quotes into specific codes based on their semantic meaning (e.g., 'narrative', 'challenges', 'autonomy', 'effort'). 3. Structural level (families/dimensions): aggregation of codes into four main thematic categories: (1) gamification, (2) values, (3) academic learning, and (4) workload. This coding tree allowed for the triangulation of the professor's and students' perspectives within each dimension. Thematic content analysis and constant comparison were used to analyze all data (Libarkin & Kurdziel, 2002). In accordance with Korstjens and Moser (2018), several standards were used to ensure quality and trustworthiness: (a) credibility: through observation, data triangulation, and review by two members of the research team; (b) transferability: through description of the whole process; (c) confirmability: through frequent meetings of the two members of the research team in charge of the qualitative data analysis to discuss data interpretation; and (d) reflexivity: through the previous standards.

Results

Quantitative Results

Regarding the Student Satisfaction Questionnaire (Table 2), most items in the first subscale, professor satisfaction, remained stable across both academic years, reaching scores very close to maximum. However, one item showed a significant increase in the 2018–19 academic year (gamification): "The selected activities promoted learning", increasing from 3.22 to 4.12 ($p = .04$) with a large effect size ($d = 0.80$). In most of the other items, there were increases from the 2017–18 to the 2018–19 academic year, although these differences were not significant. Nevertheless, three items are worth highlighting: "The professor increased my interest in the subject" which rose from 3.44 to 4.00, with a medium effect size ($d = 0.49$); "The professor demonstrated mastery of the subject"; and "Global score of the professor's performance" which increased from 4.22 and 3.67 to 4.67 and 4.25, respectively, and large effect sizes ($d = 0.64$ and $d = 0.65$).

Focusing on the third subscale, subject satisfaction (Table 3), no significant differences were found between the two academic years ($p > .05$). However, most items showed a positive trend from the 2017–18 to the 2018–19 academic year: "The subject does not overlap with content covered in other subjects" from 3.9 to 4.31 (medium effect size); "The class plan is appropriate for achieving the subject's objectives" increased from 3.8 to 4.03 (small effect size); "The references used are helpful for following the subject" increased from 3.91 to 4.05 (small effect size), and "The assessment system is appropriate for evaluating student progress" increased from 3.83 to 3.98 (small effect size).

Table 2
Subscale "Professor Satisfaction" of the Subject Assessment Questionnaire.

	Academic year					
	2017/2018		2018/2019		*p*-value	*d*
	M	*SD*	*M*	*SD*		
1. The professor complied with the teaching guide	4.44	0.73	4.40	0.72	.86	0.06
2. The professor used the assessment criteria included in the teaching guide	4.33	0.71	4.33	0.76	.93	0.00
3. Theory and practice were well coordinated	3.89	1.36	4.21	1.01	.53	0.30
4. The selected activities promoted learning	3.22	1.30	4.12	1.10	.04	0.80
5. The professor's explanations helped me understand the content	3.89	1.17	4.12	0.99	.59	0.23
6. The professor demonstrated mastery of the subject	4.22	0.97	4.67	0.66	.15	0.64
7. The professor promoted student participation in class	4.22	0.97	4.32	0.79	.83	0.12
8. The professor solved doubts and provided guidance	4.33	0.87	4.32	0.87	.96	0.01
9. The resources used were adequate for learning	4.22	1.39	4.24	0.90	.57	0.02
10. I am satisfied with the support provided by the professor	4.00	0.93	4.25	1.04	.34	0.24
11. The professor increased my interest in the subject	3.44	1.67	4.00	1.04	.43	0.49
12. Global score of the professor's performance	3.67	1.22	4.25	0.84	.17	0.65

Note. M = Mean; *SD* = Standard Deviation; *p*-value = Mann-Whitney U test; *d* Cohen = Effect size.

Table 3
Subscale "Subject Satisfaction" of the Subject Assessment Questionnaire

	Academic year					
	2017/2018		2018/2019		*p*-value	*d*
	M	*SD*	*M*	*SD*		
1. The teaching guide is helpful for planning my work	3.42	1.27	3.41	1.17	.69	0.01
2. The subject does not overlap with content covered in other subjects	3.90	1.08	4.31	0.94	.56	0.43
3. The class plan is appropriate for achieving the subject's objectives	3.80	1.00	4.03	0.94	.22	0.24
4. The references used are helpful for following the subject	3.91	1.07	4.05	1.00	.61	0.14
5. The assessment system is appropriate for evaluating student progress	3.83	1.29	3.98	0.98	.73	0.14

Note. M = Mean; *SD* = Standard Deviation; *d* = Effect size.

Qualitative Results

The triangulation of the professor's diary and students' video reflections revealed four main dimensions: Gamification, Values, Academic Learning, and Workload. The findings are presented below according to these thematic categories.

Gamification (54 meaningful excerpts: seven from the students and 47 from the teacher). As expected, the program was the most widely discussed topic among participants. Students highlighted some of the elements of this new teaching and learning approach, such as the narrative used or the challenges proposed: "We [students in a group] felt that in the final battle we could only win" (student D). The professor tried to use this pedagogical approach to motivate the students and provide guidelines for solving the challenges using an attractive story. Among other things, the professor reflected on how important was for students the use of ICTs in gamification and included new updates. (15/09/2018).

Values (37 meaningful excerpts: nine from the students and 28 from the professor). The students mentioned issues such as effort and perseverance: "I worked hard and I was ready for the challenges" (student C), as well as respect for rules, helping others and appropriate behavior. The professor referred to values such as responsibility and autonomy in students and to his own worries regarding both: "I must trust my students and share more responsibilities with them because it [gamification] is working" (04/10/2018).

Academic learning (22 meaningful excerpts: five from the students and 17 from the professor). Students reflected on their academic learning, highlighting that it was positive: "I learned to observe, assess a task globally, and select the right solution to do it correctly. I have experienced Athletics from the inside [athlete] and from the outside [coach]" (student B), also for their training as future teachers/coaches: "We learned a valuable [pedagogical] tool for teaching Athletics using games" (student I). The professor reflected on the students' learning from the beginning of the experience: "I am very pleased with the tasks that the students have designed; they are so good that I will incorporate some of them in my classes next year" (30/09/2018).

Workload (eight meaningful excerpts from the professor). This theme emerged only from the professor's comments. He highlighted the extra workload and effort that this methodological approach required: "It [gamification] demands a high degree of weekly involvement" (15/10/2018). By the end of the semester, the professor considered the time invested in this pedagogical approach worthwhile after receiving the positive feedback from the students: "There is only one week left, and I believe that it has been a success, at least for me. It was worth getting here. There have been quite a few obstacles to overcome, but the feedback from the students has been very positive and motivating, which helps me continue in this new endeavor" (16/12/2018).

Discussion

Regarding the first objective, the results showed that the gamification instructional framework did not negatively affect students' satisfaction. They even believed that "the selected activities promoted learning" significantly more than the traditional approach. The Integrative Model for Teacher Change (Kern et al., 2020) highlights the need to modify teachers' pedagogical practices through frameworks that empower them and are linked to program satisfaction. This model reinforces the idea that this necessary change should begin in college, experiencing novel frameworks that may motivate teacher education students become better teachers (Richards et al., 2019) and gamification is one of them. The pedagogical structure used is a key element in Physical Education Teacher Education, because it may or may not connect with students, and in the present study, it did so more than before. Authors such as Daumiller et al. (2019) believe that it is important for university professors to use methodological frameworks that may help them improve the quality of the global teaching-learning process, and results from the present study showed that the gamification framework achieved this. Physical Education Teacher Education has the duty to empirically test them and teach them when they are positive (Mora-González et al., 2020; Pérez-López et al., 2017). The scarce previous research on Physical Education Teacher Education has found that gamification is perceived as a positive pedagogical approach for motivating students (Sierra & Fernández, 2019), which is in line with the results obtained in the present study.

The second objective was to examine the views of the participating students and professor after experiencing gamification for the first time. Regarding academic learning, students acknowledged that they had experienced a pedagogical approach that they could use in their professional future. This is particularly important, because the Integrative Model for Teacher Change highlights program satisfaction as a key element to promote change (Kern & Graber, 2017), and participants indicated that learning was important under the gamified framework.

Within this model, confidence in attempting change and willingness to adopt different teaching approaches (such as gamification) are two personal dispositions that

may influence teachers' predisposition toward pedagogical change (Bechtel & O'Sullivan, 2007), and the results of the present study indicate that the gamified framework was positive for these future teachers.

In this regard, Navarro et al. (2024), implemented a gamification proposal based on the "MasterChef contest" with students enrolled in a teacher master's degree, highlighting the teacher's role as a differentiating element, and fostering higher levels of student engagement and satisfaction with the proposal. Only if this intended change begins in PETE, will novice teachers be able to endure physical education cultures at schools that do not support innovation (Curtner-Smith, 2017). Previous studies found similar outcomes in different university contexts (Jurgelaitis et al., 2019; Pérez-López et al., 2017), supporting the inclusion of gamification in university teaching, including physical education. Specifically, recent studies on gamified interventions based on popular culture, such as "PE Money Heist" or "Star Wars", have demonstrated significant improvements in students' motivational regulations, academic qualifications (Flores-Aguilar et al., 2023) and physical fitness (Mora-González et al., 2022).

Moreover, gamification has been identified as a pedagogical approach that improves students' participation (Huang et al., 2019; Pérez-López et al., 2025), while promoting values such as effort, resilience and responsibility, which are essential in student-centered educational contexts at all levels. In this line, research studies highlight the potential of hybridizing gamification with other pedagogical approaches, such as the Teaching Personal and Social Responsibility model, to further strengthen ethical and social dimensions in PE (Valero-Valenzuela et al., 2020), Cooperative Learning to support students' basic psychological needs, increase satisfaction with PE classes, and improve classroom climate (Flores-Aguilar et al., 2025; Jiménez-Parra et al., 2023), or Service-Learning to enhance motivation, learning, and social commitment (Navarro-Mateos & Pérez-López, 2026). Previous research has found that gamification can involve students in their learning, increasing class attendance (Pinter et al., 2020), which demands responsibility, commitment and effort. Both, the students and the professor's comments highlighted that the framework used to conduct the subject promoted these values. Jurgelaitis et al. (2019) argued that teacher educators must strive to educate future teachers using stimulating frameworks based on the students' interests in order to motivate them. The results of the present study showed that gamification placed students at the "center stage" by using an inspiring structure to encourage them to work hard, positively affecting their academic learning and, at the same time, fostering positive values.

Unfortunately, the professor's comments also uncovered a negative issue: workload. The framework required additional time and effort. Innovative pedagogical approaches require strong commitment and additional work from the teachers, which sometimes ends abruptly, when the "honeymoon period" is over (Goodyear & Casey, 2015). Previous research on gamification in primary and secondary physical education identified the same problem (Fernández-Río et al., 2020). Therefore, professors need support to implement these pedagogical approaches, and gamification is no exception. To enhance sustainability, future implementations could reduce workload by reusing materials, automating feedback through digital tools, adopting gradual or hybrid gamification models, and promoting collaboration and institutional support for instructors.

The present study also has some limitations. First, it included only one subject of the Physical Activity and Sport Sciences undergraduate program, with a small number of students. Future studies should include a larger number of subjects and participants. Second, quasi-experimental designs should be conducted to obtain causal information, and qualitative interviews should be included to extract more relevant information. Third, the questionnaire used in this study was specifically developed to address the research objectives and provided relevant data; however, it has not undergone formal psychometric validation. As such, the findings should be considered preliminary and interpreted with caution. Fourth, participants were recruited through convenience sampling from intact class groups, which limits the representativeness and generalizability of the findings. Consequently, results should be interpreted as context-bound and exploratory. Future studies including probably sampling or participants from multiple institutions would help confirm and extend these findings.

Conclusions

Gamification has been identified as a pedagogical framework suitable for Physical Education Teacher Education, with positive outcomes for future teachers. Students achieved higher grades, suggesting that they strived for the best result, and both their comments and those of their professors indicated that the framework promoted positive values such as effort, commitment, and responsibility, which are necessary for achieving high academic performance. Moreover, both participants in this study acknowledged that gamification helped improve students' academic learning. It was also perceived as a pedagogical approach that could be useful in their future professional practice in secondary physical education.

Therefore, the necessary change in physical education could begin during these teachers' initial training. However, there was one drawback: the implementation of this student-centered teaching approach increased the teacher's workload.

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