

# GAMIFICATION IN PHYSICAL EDUCATION TEACHER TRAINING: AN ANALYSIS OF THE TEACHING GUIDES OF THE MASTER'S DEGREE IN TEACHER TRAINING

## LA GAMIFICACIÓN EN LA FORMACIÓN DEL PROFESORADO DE EDUCACIÓN FÍSICA: UN ANÁLISIS DE LAS GUÍAS DOCENTES DEL MÁSTER DE FORMACIÓN DEL PROFESORADO

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### Abstract

This study explores the presence of gamification in the various sections of course syllabi for Physical Education subjects within Master's Degrees in Teacher Training for Compulsory Secondary Education, Baccalaureate, Vocational Training, and Language Teaching in Spain. A qualitative and descriptive analysis was conducted on a total of 237 course syllabi from 54 universities, both public and private. The results reveal a limited and uneven presence of gamification, suggesting a potential gap in the theoretical and practical training of future teachers. In this context and considering the growing scientific impact of gamification in recent years — especially due to the positive effects attributed to it — while also acknowledging the existence of an uncritical perspective that may lead to inadequate implementations and counterproductive effects on students, this study highlights the need to strengthen teacher training in this area. The appropriate inclusion of gamification in course syllabi could represent a first step toward a more robust and well-founded integration into teaching and learning processes.

**Keywords:** Course syllabi, gamification, physical education, Higher Education.

### Resumen

Este estudio explora la presencia de la gamificación en los distintos apartados de las guías docentes de las asignaturas de la especialidad de Educación Física en los Másteres Universitarios de Formación del Profesorado de Educación Secundaria Obligatoria y Bachillerato, Formación Profesional y Enseñanzas de Idiomas en España. Se realizó un análisis cualitativo y descriptivo de un total de 237 guías docentes procedentes de 54 universidades, tanto públicas como privadas. Los resultados evidencian una presencia limitada y desigual de la gamificación, lo que sugiere una posible carencia en la formación teórico-práctica del futuro profesorado. En este contexto, y considerando el creciente impacto científico de la gamificación en los últimos años —especialmente por los efectos positivos que se le atribuyen—, pero también reconociendo la existencia de una visión acrítica que puede conducir a implementaciones inadecuadas y efectos contraproducentes en el alumnado, este estudio subraya la necesidad de reforzar la formación docente en esta materia. La inclusión adecuada de la gamificación en las guías docentes podría representar un primer paso hacia una integración más sólida y fundamentada en los procesos de enseñanza-aprendizaje.

**Palabras clave:** Guías docentes, gamificación, educación física, educación superior.

## Introduction

Within the framework of the Sustainable Development Goals (SDGs) established in the United Nations 2030 Agenda, initial teacher training in higher education plays a fundamental role in fulfilling Goal 4: "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all". Following this same direction, Estebaranz (2012) concludes that initial teacher training constitutes a key element for elevating educational quality standards. Therefore, being cognisant of the new and evolving challenges that citizens face in the 21st century, the critical review of academic programmes takes on special significance. For instance, it is worth noting that since the implementation of the European Higher Education Area (EHEA), the importance of granting university students a more prominent role has been advocated (Berné et al., 2011). To accomplish this, academic staff should incorporate new methodological approaches into their classrooms that centre attention on the student, providing them with successful experiences that meet their needs and even improve their motivation in the classroom (Lim et al., 2019; Schnepfleitner & Ferreira, 2021). Indeed, Rovegno (2008) emphasises that the creation of future quality programmes in schools depends largely on the learning experiences of teachers during their training. For this reason, it is important that future teachers experience first-hand during their formative trajectory, both at theoretical and practical levels, all those innovative educational trends whose positive effects are being recently evidenced by scientific literature (Segovia et al., 2023). Only in this way can these new teaching-learning processes be better transferred to compulsory education, thus generating improvements in educational quality (Flores-Aguilar et al., 2023).

This latter point takes on particular importance, especially regarding Physical Education (PE). According to López-Pastor et al. (2016) and Pérez-Pueyo and Hortigüela (2020), the teaching of 21st century PE should be urgently reconsidered. Despite the significant evolution it has undergone since its introduction into schools, there currently exists a dangerous "generational gap": 21st century pupils continue to experience a subject whose essential approaches have their origin in the 20th century (Flores-Aguilar & Fernández-Río, 2021). That is, PE continues to be oriented towards free play (absence of learning) and/or performance (mechanistic and biological perspective) (Tinning, 2002), with directive and analytical methodologies (training), as well as subjective, summative and penalising evaluation systems (López-Pastor et al., 2016). This reality tends to increase pupil disinterest (Ntoumanis, 2001), and even their anxiety levels, especially among female secondary school students (Rodríguez-Martín et al., 2022).

Notwithstanding, PE plays a key role in the holistic development of students (López-Pastor et al., 2016), in the creation and recreation of a physical culture (Kirk, 2008), and in the fight against sedentary lifestyles and obesity amongst children and adolescents (Gasol Foundation, 2022), among other aims. For this to be the case, the literature assigns a special role to the incorporation of Pedagogical Models (PM), including gamification, as they achieve more authentic practices and more positive achievement experiences (Fernández-Río et al., 2016).

Gamification first appeared in 2010 in the United States business sector, when several researchers began to discover the potential of games and video games in their discipline. In this framework, Werbach and Hunter (2012, p. 28) and Kapp (2012, p.36) defined it as "the use of game elements and design techniques in non-game contexts" and as the utilisation of "game mechanics and dynamics (especially video games), aesthetics and game thinking, to engage people, motivate actions, stimulate learning and solve problems", respectively. According to Dichev and Dicheva (2017), gamification seeks to harness the potential of games and the enjoyment associated with them to motivate and provoke a change in player behaviour. Under these premises, gamification began to extend to various fields, such as marketing, human resources and health, with the aim of increasing consumer loyalty, optimising employee performance, improving health levels and promoting physical fitness, among other purposes.

In this vein, the emergence of gamification in the educational field is also recent. In 2014, the Horizon Report highlighted gamification as an ideal methodology for implementation in university contexts (Johnson et al., 2014). Indeed, the first educational experiences were situated in higher education, primarily among the Faculties of Technology and Engineering (Prieto, 2020). Progressively, gamification was incorporated into teacher training, with special emphasis on the PE area. Studies on this subject have demonstrated multiple positive effects, such as increased levels of motivation (particularly intrinsic), satisfaction, commitment and learning (Ferriz Valero et al., 2019, 2020; Flores-Aguilar et al., 2021; Flores-Aguilar et al., 2023; Pérez-López, 2023; Pérez-López & Rivera García, 2017; Pérez-López et al., 2017; Pérez-López et al., 2019; Sotos-Martínez et al., 2024). Furthermore, it has been established that it can contribute to improving participants' physical health (Sañudo et al., 2024), among other benefits.

Nevertheless, regarding the educational context, Blázquez and Flores-Aguilar (2020) emphasise the existence of certain drawbacks that interfere negatively, such as terminological imprecisions (Gamification vs. Serious Games / Gamification vs. Game-Based Learning); the absence of critical reflection by teachers; and the lack of specific guidelines for its design and implementation. Indeed, Pérez-Pueyo and Hortigüela (2020) warn of the existence of some teachers who, amazed by the novelty and aesthetic changes it produces, design and apply inadequate or reductionist gamified experiences, whose limitations are notable: excessive dependence on external rewards; increased competitiveness due to immediate hierarchisation; struggle for supremacy and status at any cost; poor maintenance of motivation and early appearance of demotivation (Blázquez & Flores-Aguilar, 2020).

Faced with this reality, and as a starting point, Flores-Aguilar and Fernández-Río (2021, p.11) hastened to conceive gamification in education as an emergent Pedagogical Model "that uses game elements to develop specific curricular content within a context, which includes tasks and activities adapted to the dynamics of the game to achieve the established educational objectives, and not simply for entertainment". Simultaneously, to assist in the design and implementation of this emergent PM, Blázquez and Flores-Aguilar (2020) proposed a reference structure focusing on two phases. The first is the "didactic phase" and is identified with the same process that each teacher must consider when developing any type of project or task (drafting of competencies, learning objectives, design of assessment instruments, etc.). The second is the "gamified phase" and focuses on the selection and adaptation of some of the main "basic game elements" described by Werbach and Hunter (2012). Similarly, Blázquez and Flores-Aguilar (2020) remind us that "both phases are inseparable and essential. Ignoring the didactic phase, above all, is an error that will distort the purpose of gamification itself: to learn more and better" (p. 304).

At this juncture, being cognisant of the advantages that gamification can generate among future PE teachers, but especially among pupils in primary and secondary PE classes (Ferriz-Valero et al., 2023), analysing the place that gamification occupies in the curricula of future teachers and the training received in this regard takes on special interest; particularly in light of the limited preparation that exists during their training as teachers (Sampedro-Martín et al., 2023). In line with other similar research, such as that of Ureña et al. (2025), Serra et al. (2016), Flores-Aguilar, Pérez-Pueyo, et al. (2023) and Segovia et al. (2023), among others, and according to the guidelines of Coles and Grant (1985), when resources limit a more extensive evaluation, a first step would be to examine university curricula on paper. That said, the objective of this study was to analyse the presence (mention-appearance) of gamification in the different sections of the teaching guides (TG) of PE subjects present in the curricula of the Master's Degree in Teacher Training for Compulsory Secondary Education and Baccalaureate, Vocational Training and Language Teaching in Spain (MAES).

## Material and Methods

### Design

From a qualitative approach, a descriptive analysis was conducted through the development of documentary analysis (Heinemann, 2003).

### Study Sample

The research was carried out through purposive sampling (Patton, 2002) of the TG of subjects exclusive to the Physical Education speciality, belonging to the curricula of all public and private universities in Spain that offered this speciality of the MAES during the 2024/2025 academic year. A total of 54 universities (32 public and 22 private) were identified, distributed across 63 faculties or centres. From this set, complete access was achieved to 237 TG, whilst another 10 guides could not be consulted as they were not available on the corresponding websites.

### Instruments

An ad hoc spreadsheet (Excel) was designed to record information from all the identified TGs. This spreadsheet consisted of twelve columns where the information found was filtered according to the following variables: a) University (public – private); b) Centre; c) Subject; d) Objectives – Learning Outcomes; e) Competencies; f) Contents; g) Training Activities; h) Methodology; i) Assessment Systems; and j) Bibliographic References.

Procedure

With the assistance of the QEDU portal (What to Study and Where in the University) of the Ministry of Science, Innovation and Universities (<http://siiu.universidades.gob.es/QEDU-2/>), a search was conducted for all Spanish universities, both public and private, that offered the MAES degree (PE speciality) (academic year 2024/2025). Subsequently, the TG of each of the subjects available on the websites of each of the identified centres were consulted. Following this, a search was carried out for the presence of the term "gamification" in both Spanish and English, in the different sections of the TG.

Data Analysis

The data analysis was conducted using a descriptive approach. For this purpose, a Microsoft Excel spreadsheet was utilised, through which absolute frequencies and percentages corresponding to each of the qualitative variables considered in the study were estimated.

Results

The results reveal the presence of gamification in a total of 33 TG (14%), belonging to 22 universities (41%), of which 16 were public (73%) and 6 private (27%), across a total of 24 centres or faculties (38%). More specifically, Table 1 displays the specific sections of each TG where gamification appears, alongside the name of the subject that includes it, the university and the centre-faculty where it is taught. As can be observed, gamification appears prominently in the bibliographic references of the subjects (n = 32) and in the contents (n = 12), and to a lesser extent in the learning objectives-learning outcomes (n = 2), methodology (n = 2) and teaching-learning activities (n = 1). No mention was found in the competencies or assessment activities. Furthermore, only 5 of the subjects (15%) included gamification in two sections, such as in the contents and bibliographic references, or in the objectives and contents, etc.; whilst none incorporated it in three or more sections. Regarding the identified universities, Rey Juan Carlos University (public) contains three subjects in whose curricula gamification appears, whilst the Universities of Barcelona, Cádiz, Córdoba, Málaga, Pablo de Olavide, Politécnica de Madrid and Salamanca contain two subjects each. Finally, Table 1 demonstrates that gamification tends to be addressed in all those subjects dedicated to the treatment of innovation in PE.

Table 1  
*Gamification in Various Sections of Teaching Guides (Frequency of Occurrence)*

| University                               | Subject                                                               | OBJ/RA | CP | CONT | MET | ACT | EVA | REF |
|------------------------------------------|-----------------------------------------------------------------------|--------|----|------|-----|-----|-----|-----|
| University of Alicante (Public)          | Foundations for Physical Education and Sport                          |        |    | 1    |     |     |     | 1   |
| Autonomous University of Madrid (Public) | Learning and Teaching in Physical Education                           |        |    |      |     |     |     | 5   |
| University of Barcelona (Public)         | Innovation and Research Applied to Physical Education                 |        |    |      |     |     |     | 2   |
|                                          | Body Expression and Leisure Time                                      |        |    |      |     |     |     | 1   |
| University of Cádiz (Public)             | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     | 3   |
|                                          | Additional Disciplinary Training in PE                                |        |    |      |     |     |     | 1   |

**Tabla 1**

| University                                                   | Subject                                                               | OBJ/RA | CP | CONT | MET | ACT | EVA | REF |
|--------------------------------------------------------------|-----------------------------------------------------------------------|--------|----|------|-----|-----|-----|-----|
| Catholic University of Valencia San Vicente Mártir (Private) | Teaching Resources for Physical Education and Sport                   |        |    | 1    |     |     |     |     |
| University of Córdoba (Public)                               | Additional Disciplinary Training in PE                                |        |    |      |     |     |     | 1   |
|                                                              | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     | 1   |
| European University of the Atlantic (Private)                | ICT in Educational Processes in PE and Sport                          |        |    |      |     |     |     | 1   |
| University of Extremadura (Public)                           | Methodology and Learning in Physical Education                        |        |    | 1    |     |     |     | 1   |
| University of Granada (Public). Granada Centre               | Educational Innovation and Introduction to Educational Research in PE |        |    | 1    |     |     |     |     |
| University of Granada (Public). Ceuta Centre                 | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     |     |
| International University of Valencia (Private)               | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     | 1   |
| University of La Laguna (Public)                             | Educational Innovation and Introduction to Educational Research in PE |        |    | 1    |     |     |     |     |
| University of Málaga (Public)                                | Additional Disciplinary Training in PE                                |        |    | 1    |     |     |     |     |
|                                                              | Design and Development of Educational Programmes and Activities in PE |        |    |      |     |     |     | 1   |
| Middle Atlantic (Private)                                    | Learning and Teaching in Physical Education                           |        |    |      |     |     |     | 1   |

**Tabla 1**

| University                                    | Subject                                                                  | OBJ/RA | CP | CONT | MET | ACT | EVA | REF |
|-----------------------------------------------|--------------------------------------------------------------------------|--------|----|------|-----|-----|-----|-----|
| Miguel Hernández University of Elche (Public) | Innovation and New Technologies in Education                             | 1      |    | 1    |     |     |     |     |
| Pablo Olavide University (Public)             | Additional Disciplinary Training in Physical Education                   |        |    |      | 1   |     |     |     |
|                                               | Educational Innovation and Introduction to Educational Research in PE    |        |    | 1    | 1   |     |     |     |
| University of the Basque Country (Public)     | Didactic References for Physical Education in Secondary and Bachillerato | 1      |    |      |     |     |     |     |
| Polytechnic University of Madrid (Public)     | Innovation and Research in Physical Education                            |        |    | 1    |     | 1   |     |     |
|                                               | Information and Communication Technologies Applied to Physical Education |        |    | 1    |     |     |     | 2   |
| King Juan Carlos University (Public)          | Didactics of Physical Education                                          |        |    |      |     |     |     | 1   |
|                                               | Curriculum Design in Physical Education                                  |        |    |      |     |     |     | 2   |
|                                               | Educational Innovation and ICT Applied to Teaching Physical Education    |        |    |      |     |     |     | 1   |
| University of Salamanca (Public)              | Resources in the Specialisation of Physical Education                    |        |    | 1    |     |     |     |     |
|                                               | Didactics in the Specialisation of Physical Education                    |        |    |      |     |     |     | 1   |
| San Jorge University (Private)                | Specialisation in Physical Education                                     |        |    |      |     |     |     | 1   |

**Tabla 1**

| University                                   | Subject                                                               | OBJ/RA | CP | CONT | MET | ACT | EVA | REF |
|----------------------------------------------|-----------------------------------------------------------------------|--------|----|------|-----|-----|-----|-----|
| University of Seville (Public)               | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     | 2   |
| University of Seville (Public). Osuna Centre | Educational Innovation and Introduction to Educational Research in PE |        |    |      |     |     |     | 2   |
| Vic University - UCC (Private)               | Curriculum for Physical Education in Compulsory Education             |        |    |      |     |     |     | 1   |
| <b>TOTAL</b>                                 |                                                                       | 2      | 0  | 12   | 2   | 1   | 0   | 32  |

Notes. OBJ/RA: Objectives - Learning Outcomes; CP: Competencies; CONT: Contents; MET: Methodology; ACT: Teaching and Learning Activities; EVA: Evaluation Systems - Criteria; REF: Bibliographic References

As shown in Table 2, both the subject "Innovation and new technologies in education" (Miguel Hernández University of Elche) and "Didactic references of PE in secondary and baccalaureate" (University of the Basque Country) contain an objective-learning outcome linked to the learning and use of gamification. Furthermore, the former incorporates a specific topic among its contents. Additionally, Pablo Olavide University (public) contains two subjects where gamification appears as one of the learning methodologies employed. Regarding the use of gamification as a training activity, only the subject "Innovation and research in PE" (Technical University of Madrid) makes reference to this.

**Table 2**

*Gamification in Learning Objectives and Outcomes, Methodology, and Educational Activities*

| University                                    | Subject                                                                  | Objectives - Learning Outcomes                                                                           |
|-----------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Miguel Hernández University of Elche (Public) | Innovation and New Technologies in Education                             | Acquire foundational knowledge about the use of ICT tools for gamification, dissemination, and outreach. |
| University of the Basque Country (Public)     | Didactic References for Physical Education in Secondary and Bachillerato | Be able to use the flipped classroom and gamification to integrate theoretical content related to PE.    |
| University                                    | Subject                                                                  | Methodology                                                                                              |
| Pablo Olavide University (Public)             | Additional Disciplinary Training in Physical Education                   | Flipped Classroom. Gamification.                                                                         |
|                                               | Educational Innovation and Introduction to Educational Research in PE    | Flipped Classroom. Gamification                                                                          |
| University                                    | Subject                                                                  | Educational Activities                                                                                   |
| Polytechnic University of Madrid (Public)     | Innovation and Research in Physical Education                            | Microgamification. Escape Classroom. Gamification Methodology through PBL CLASSDOJO                      |

Table 3 illustrates the important place that gamification occupies in the didactic contents of the analysed TG ( $n = 12$ ) (24.4%), although eight of these subjects do not incorporate gamification in any other section, whilst the remainder do include it among their objectives, methodology, activities or bibliographic references. Regarding the latter, gamification appears on 32 (65.3%) occasions within the bibliographic citations of 20 of the analysed subjects (60%). Although only one bibliographic reference is included in 14 of them (70%), in others two or three references appear simultaneously. Exceptionally, the subject "Learning and teaching of PE" (Autonomous University of Madrid) incorporates up to 5 works on the topic (Table 4). In general, and as shown in Table 5, the TG contain 19 references divided into 4 books, 13 articles, 2 book chapters, where 15 of which are written in Spanish and the other 4 in English (Table 5). Among all of them, the work entitled "Gamification in Physical Education" (Sebastiani & Campos, 2019) ( $n = 6$ ) and the article by Arufe-Giráldez (2019) entitled

"Fortnite PE, a new sports game for the Physical Education classroom: Proposal for innovation and gamification based on the Fortnite video game" ( $n = 4$ ) stand out.

**Table 3**

*Gamification in Learning Content*

| University                                                   | Subject                                                                  | Learning Content                                                                                                                                                  |
|--------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| University of Alicante (Public)                              | Foundations for Physical Education and Sport                             | Experimentation with various teaching techniques using ICT and Communication (flipped classroom, gamification in the classroom, cooperative methodologies, etc.). |
| Catholic University of Valencia San Vicente Mártir (Private) | Teaching Resources for Physical Education and Sport                      | Topic 5: Active Methodologies in Physical Education (Gamification)                                                                                                |
| University of Extremadura (Public)                           | Methodology and Learning in Physical Education                           | Topic 4: Development of new pedagogical models and teaching methodologies in the PE classroom (including gamification, etc.).                                     |
| University of Granada (Public). Granada Centre               | Educational Innovation and Introduction to Educational Research in PE    | Disruptive Methodologies in the Classroom: Gamification                                                                                                           |
| University of Granada (Public). Ceuta Centre                 |                                                                          | Disruptive Methodologies in the Classroom: Gamification                                                                                                           |
| University of La Laguna (Public)                             | Educational Innovation and Research in Teaching Physical Education       | Topic 8: Gamification                                                                                                                                             |
| University of Málaga (Public)                                | Additional Disciplinary Training in Physical Education                   | Active Methodologies – Gamification                                                                                                                               |
| Miguel Hernández University of Elche (Public)                | Innovation and New Technologies in Education                             | Gamification and Mobile Learning. Virtual Community and Collaborative Spaces                                                                                      |
| Pablo Olavide University (Public)                            | Educational Innovation and Introduction to Educational Research in PE    | Innovative Models and Methodologies in PE (gamification, PBL, flipped classroom, Service-Learning, collaborative learning, comprehensive teaching model, etc.)    |
| Polytechnic University of Madrid (Public)                    | Innovation and Research in Physical Education                            | Gamification Activities: Platforms and Assessment                                                                                                                 |
|                                                              | Information and Communication Technologies Applied to Physical Education | Topic 6: Gamification in Physical Education                                                                                                                       |
| University of Salamanca (Public)                             | Resources in the Specialisation of Physical Education                    | BLOCK II: Gamification, Motivating Environments and Materials for PE Classes                                                                                      |

**Table 4**

*Gamification in bibliographic references*

| University                           | Subject                                                               | Bibliographic References                                                                                                                                    |
|--------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| King Juan Carlos University (Public) | Curriculum Design in Physical Education                               | Gamification in Physical Education (Sebastiani & Campos, 2019). Gamification in Physical Education II: The Adventure Continues (Sebastiani et al., 2021)    |
| King Juan Carlos University (Public) | Educational Innovation and ICT Applied to Teaching Physical Education | ICT Tools for Gamification in Physical Education (Victoria-González, 2020)                                                                                  |
| University of Málaga (Public)        | Design and Development of Educational Programmes and Activities in PE | The Active Methodology of Gamification to Improve Motivation and Academic Performance in an Educational Context: A Meta-Analysis (Mula-Falcón et al., 2022) |
| University of Córdoba (Public)       | Additional Disciplinary Training in Physical Education                | Gamification: Active Methodologies in Physical Education in University Teaching (Ferriz Valero et al., 2019)                                                |
| University of Córdoba (Public)       | Educational Innovation and Introduction to Educational Research in PE | Gamification: Active Methodologies in Physical Education in University Teaching (Ferriz Valero et al., 2019)                                                |
| University of Salamanca (Public)     | Didactics in the Specialisation of Physical Education                 | Gamification in Physical Education (Sebastiani & Campos, 2019)                                                                                              |

**Table 4**

| University                                     | Subject                                                               | Bibliographic References                                                                                                                                                 |
|------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| University of Barcelona (Public)               | Body Expression and Leisure Time                                      | Gamification in Physical Education (Sebastiani & Campos, 2019)                                                                                                           |
| University of Alicante (Public)                | Foundations for Physical Education and Sport                          | Gamification in Physical Education (Sebastiani & Campos, 2019)                                                                                                           |
| Vic University - UCC (Private)                 | Curriculum for Physical Education in Compulsory Education             | Gamification in Physical Education (Sebastiani & Campos, 2019)                                                                                                           |
| San Jorge University (Private)                 | Specialisation in Physical Education                                  | Gamification in Physical Education II: The Adventure Continues (Sebastiani et al., 2021)                                                                                 |
| European University of the Atlantic (Private)  | ICT in Educational Processes in PE and Sport                          | ICT Tools for Gamification in Physical Education (Victoria-González, 2020)                                                                                               |
| Middle Atlantic (Private)                      | Learning and Teaching in Physical Education                           | ICT Tools for Gamification in Physical Education (Victoria-González, 2020)                                                                                               |
| International University of Valencia (Private) | Educational Innovation and Introduction to Educational Research in PE | Fortnite in PE: A New Sports Game for the Physical Education Classroom: Proposal for Innovation and Gamification based on the Fortnite Video Game (Arufe-Giraldez, 2019) |
| University of Cádiz (Public)                   | Additional Disciplinary Training in Physical Education                | The Effects of Gamification on the Motivation and Basic Psychological Needs of Secondary School Physical Education Students (Sotos-Martínez et al., 2022)                |

**Table 5**

*Gamification in Bibliographic References II*

| Title and Authorship                                                                                                                                                     | N | T  | I |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Gamification in Physical Education (Sebastiani & Campos, 2019)                                                                                                           | 6 | L  | C |
| Fortnite in PE: A New Sports Game for the Physical Education Classroom: Proposal for Innovation and Gamification based on the Fortnite Video Game (Arufe-Giraldez, 2019) | 4 | A  | C |
| ICT Tools for Gamification in Physical Education (Victoria-González, 2020)                                                                                               | 3 | A  | C |
| Beyond the Textbook: ICT-Mediated Gamification as an Innovative Alternative in Physical Education (Quintero et al., 2018)                                                | 2 | A  | C |
| Gamification in Physical Education II: The Adventure Continues (Sebastiani et al., 2021)                                                                                 | 2 | L  | C |
| Gamification: Active Methodologies in Physical Education in University Teaching (Ferriz Valero et al., 2019)                                                             | 2 | A  | C |
| The Effects of Gamification on the Motivation and Basic Psychological Needs of Secondary School Physical Education Students (Sotos-Martínez et al., 2022)                | 1 | A  | I |
| The Potential of Gamification Applied to the Educational Field (Díaz & Troyano, 2013)                                                                                    | 1 | CL | C |

**Table 5**

| Title and Authorship                                                                                                                                        | N | T  | I |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|
| Casual Social Games as Serious Games: The Psychology of Gamification in Undergraduate Education and Employee Training (Landers & Callan, 2012)              | 1 | CL | I |
| Gamification: The Power of Play in Business Management and Customer Connection (Marín & Hierro, 2013)                                                       | 1 | L  | C |
| The Active Methodology of Gamification to Improve Motivation and Academic Performance in Educational Context: A Meta-Analysis (Mula-Falcón et al., 2022)    | 1 | A  | I |
| Play the Game: Gamification and Healthy Habits in Physical Education (Monguillot-Hernando et al., 2015)                                                     | 1 | A  | C |
| Development of a Gamification Project and Globalised Learning in Physical Education (Santos-Gil, 2021)                                                      | 1 | A  | C |
| Significant Learning through Gamification using Role-Playing: "The Villages of History" (Fernández-Gavira et al., 2018)                                     | 1 | A  | C |
| Gamifying Physical Education: From Theory to Practice in Primary and Secondary Education (Fernández-Rio, 2019)                                              | 1 | L  | C |
| Gamification in Physical Education: A Systematic Analysis of Documented Sources (León-Díaz et al., 2019)                                                    | 1 | A  | C |
| Gamification as a New Methodology to Improve Academic Performance among Young People: A Strategy from Physical Education Classes                            | 1 | A  | C |
| The (at least) 7 Deadly Sins Surrounding Gamification (Pérez-López, 2019)                                                                                   | 1 | A  | C |
| Training Teachers, Training Individuals: Analysis of Learning Achievements by University Students from a Gamification Experience (Pérez-López et al., 2017) | 1 | A  | I |

*Note.* N: number, T: type, I: Language, L: book, CL: Book Chapter, A: Article; C: Spanish; I: English

## Discussion

The aim of this study was to analyse the presence of gamification in the PE speciality subjects of the MAES through an analysis of the different sections of the TG available in the curricula of each Spanish university. Being aware of the subjectivity of this study, since the mere presence or absence of this concept in the TGs does not ensure its actual incorporation in the subjects, neither at a theoretical nor practical level, this work aims to offer, at least, a general overview that allows visualisation of the presence of this emerging PM in these official documents. It is worth noting that TGs are official and public documents which, as an exercise in academic transparency (García-Hernández & Cano-Muñoz, 2021), structure the key elements of

the formative process (competencies, learning outcomes, contents, etc.) as an "academic contract" between teachers and students (Appling et al., 2015).

With a presence of 14% in the TG of the 2024/2025 academic year taught in less than half of the Spanish universities studied, it could generally be said that gamification occupies a residual place in the TG of this PE teacher training, especially among private universities. Simultaneously, this presence could be considered inconsistent and unbalanced, as in most cases it only appears in one of the sections of each guide, typically in the bibliography or in the contents. It should be noted that, even despite being an emerging PM, these results resemble the research of Flores-Aguilar, Pérez-Pueyo, et al. (2023) on Cooperative Learning (CL) in the MAES and of Segovia et al. (2023) on the Sport Education Model (SEM) in the Primary Education Degree. Undoubtedly, and provided that the nature (competencies, objectives, etc.) of the subjects allows it, a coherent approach to gamification at the training level would require, at minimum, its treatment as content or methodology, but also its prominent presence in the objectives or in the bibliographic references that allow students to delve deeper into this subject (Robson et al., 2015).

The greatest presence of gamification within the TG was found in the bibliographic references; something that is also repeated with CL (Flores-Aguilar, Pérez-Pueyo, et al., 2023) and differs from SEM (Segovia et al., 2023). With a total of 19 identified references (4 books, 13 articles and 2 book chapters), 15 in Spanish and 4 in English, gamification was present in most of the analysed subjects (60%). Undoubtedly, these numbers are still far from the 65 references identified on CL in this same university study by Flores-Aguilar, Pérez-Pueyo, et al. (2023), which again evidences the conception of gamification as a PM in the process of consolidation (Pérez-Pueyo et al., 2021). Furthermore, and with the exception of the subject "Learning and teaching of PE" (Autonomous University of Madrid) which included 5 works on the topic, most subjects only included one reference (70%), among which the book by Sebastiani and Campos (2019) ( $n = 6$ ) stands out. To improve this point, it would be interesting to increase the presence of references that would help to reflect critically at a theoretical, conceptual and procedural level on this model, as well as explain how to gamify step by step (Fernández-Río, 2019; Flores-Aguilar & Fernández-Río, 2021), even in higher education (Ripoll & Pujolà, 2024), since its design and implementation usually requires high teacher involvement and careful planning (Flores-Aguilar, Prat-Grau, et al., 2023). Whilst it is true that works compiling gamified experiences (Sebastiani & Campos, 2019; Sebastiani et al., 2021) tend to be striking and inspiring for in-service teachers, it should be remembered that more and more teachers are affected by the "immediacy syndrome" and implement "pseudo-gamifications" in search of an immediate or striking result, but in the absence of any kind of reflection (Pérez-Pueyo & Hortigüela, 2020). It would also be advisable to increase the number of scientific articles that demonstrate the effects of gamification on the school population, among which is the work of Ferriz-Valero et al. (2023), in addition to including some essential-basic references on gamification, such as the works of Werbach and Hunter (2012) and Kapp (2012). Finally, and as far as language is concerned, this work undoubtedly corroborates Spain's position as the country with the most publications on gamification in education (Jaramillo-Mediavilla et al., 2024).

Regarding the contents, gamification also had an important presence in the analysed TG ( $n = 12$ ) (24.4%), to the extent that it was higher than that of CL (Flores-Aguilar, Pérez-Pueyo, et al., 2023). Whilst it is true that this could be considered an important advance in improving the theoretical or practical training of future teachers, it is negatively noteworthy how these subjects mostly did not include any bibliographic references that could support the theoretical or practical content addressed (Thomas, 2021).

Furthermore, despite the large number of research studies that have applied gamification in PE teacher training with highly beneficial results for students, the analysis of the TG reveals the almost non-existent experience of gamification as a methodology in the MAES subjects, something that would deviate from the recommendations of Flores-Aguilar et al. (2021), who explicitly suggest the need to include gamification as an active methodology in some of the teacher training subjects. Indeed, it is worth recalling the importance of trainee teachers experiencing as students all those methodological innovations that are subsequently intended to be implemented in schools (Hortigüela-Alcalá et al., 2020; Rovegno, 2008; Segovia et al., 2023). In the case of gamification, Dichev and Dicheva (2017) specify that the lack of adequate training often leads to superficial implementations. Nevertheless, this result reveals how some subjects that do apply gamification as a methodology, since their experiences and results are published, do not incorporate gamification in the methodology section of the corresponding TG.

The present study has several limitations that should be considered. Firstly, and as previously noted, the analysis of TG does not necessarily reflect a real image of what finally occurs in the classrooms. In fact, in some cases, TG may become a basic summary of the subjects. Secondly, this work has focused exclusively on the TG of the MAES in Spain, leaving aside, on this occasion, the analysis of university degrees. Therefore, and as future lines of research, this investigation suggests the inclusion of the analysis of TGs from the Primary Education Degree and Physical Activity and Sport Sciences, in addition to conducting qualitative studies that gather the opinions and experiences of teachers and students on gamification. Finally, it would also be interesting to include training plans for university teachers, as well as communities of practice or exchange between teachers to discuss, reflect and share gamified experiences.

### Conclusions

The analysis of the presence of gamification in the Teaching Guides of Physical Education speciality subjects within the MAES has revealed concerning findings. Despite the growing recognition of gamification in the scientific field, its incorporation in these documents remains limited. Having demonstrated an unsystematic and unbalanced presence in the different sections of the guides, particularly at the methodological level, it could be said that the training on gamification that future teachers receive is insufficient. For all these reasons, this work highlights the importance of increasing the inclusion of gamification in the Teaching Guides of initial PE teacher training to ensure better transfer to future PE classes.

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Not applicable.

### Conflict of Interest Statement

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### Authors' Contribution

Conceptualization D.M.R., G.F.A.; Methodology P.G-R, A.M.L.; Formal Analysis P.G-R; Investigation D.M.R., G.F.A., P.G-R, A.M.L.; Resources D.M.R., G.F.A.; Data Curation P.G-R; Writing – Original Draft D.M.R., G.F.A., P.G-R; Writing – Review & Editing D.M.R., G.F.A., A.M.L.; Visualization A.M.L.; Supervision G.F.A. All authors have read and agreed to the published version of the manuscript.

### Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author pgomez8@us.es.

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