



Serious Games: Formación innovadora para docentes y profesionales de la educación

Serious Games as an Innovative Approach to Teacher Training and Professional Development in Education

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ABSTRACT

This study investigates *serious games* as instructional and training instruments, evaluating their relevance and transferability across multiple domains, including education, healthcare, defense, public policy, and professional skill development, alongside their progression from conventional game formats to sophisticated digital simulation-based environments. The work is grounded in a systematic review of scholarly and professional sources, incorporating theoretical contributions from researchers such as Sande Chen, David Michael, Michael Zyda, and Clark Abt. It further analyses existing typologies, applied implementations, and ongoing conceptual discussions concerning the boundaries and definitional scope of serious games. Serious games extend beyond recreational purposes, functioning as mechanisms for experiential learning, competency development, and strategic communication. Their spectrum of applications includes interactive simulations, game-based learning frameworks, edutainment models, and socially oriented game design. As early as the 1970s, Clark Abt highlighted their pedagogical significance, including their use in non-digital formats such as board games and outdoor role-playing activities. However, a consensual and standardized definition remains unresolved, and non-digital implementations continue to be relevant in certain contexts. In conclusion, serious games are increasingly recognized as a flexible and effective paradigm adaptable to diverse instructional and training objectives. Their capacity to integrate education, structured training, and skills acquisition reinforces their value as an innovative pedagogical strategy, establishing them as tools that extend well beyond purely entertainment-driven functions.

PALABRAS CLAVE

Serious Games
Herramientas
Pedagogía
Competencias
Aprendizaje

RESUMEN

El presente estudio examina los Serious Games (videojuegos serios) como herramientas pedagógicas y formativas, evaluando su aplicabilidad en contextos educativos, sanitarios, de defensa, política y desarrollo profesional, así como su evolución desde juegos tradicionales hasta entornos de simulación digital complejos. Este estudio aborda una revisión sistemática de literatura académica y profesional, integrando las perspectivas de especialistas como Sande Chen, David Michael, Michael Zyda y Clark Abt. Se exploran tipologías, aplicaciones prácticas y debates conceptuales sobre el alcance y la definición de los Serious Games. Los Serious Games trascienden la función lúdica, promoviendo el aprendizaje significativo, la adquisición de competencias y la comunicación estratégica. Su diversidad incluye simulaciones interactivas, aprendizaje basado en juegos, edutainment y juegos con impacto social. Desde la década de 1970, Clark Abt ya señalaba su utilidad educativa, incluso mediante juegos de mesa o dinámicas de rol al aire libre. No obstante, persiste la ausencia de una definición unificada, y en determinados sectores se emplean enfoques no digitales. Se concluye indicando que los Serious Games se consolidan como un recurso versátil y eficaz, capaz de adaptarse a distintos objetivos y entornos formativos. Su potencial para integrar enseñanza, entrenamiento y desarrollo de habilidades destaca su relevancia como estrategia innovadora, posicionándolos como un instrumento educativo que supera la mera función recreativa.

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1. Introduction

1.1. Background and Perspectives on the Phenomenon

The fields of application of serious games currently encompass a broad range of sectors, including healthcare, defense, education, public policy, professional training, and the environment, and continue to expand progressively.

As a consequence, serious games constitute a heterogeneous and constantly evolving market. This position is reflected in a highly diversified taxonomy used to describe the phenomenon, which includes terms such as educational games, simulations, games with alternative purposes, edutainment, digital game-based learning, immersive learning simulations, social impact games, persuasive games, games for the common good, synthetic learning environments, and games with an agenda.

This terminological multiplicity highlights the diversity of actors involved in the field, as well as the heterogeneity of their conceptual and methodological approaches. Despite this diversity of nomenclature, several contemporary definitions of serious games have been proposed.

One of the most frequently cited is that of video game designers Sande Chen and David Michael, who define them as “games whose primary purpose is not entertainment.” In a more specific formulation, Professor Michael Zyda, director of the USC GamePipe Laboratory in Los Angeles, defines serious games as “a mental contest played on a computer under specific rules, which uses entertainment to advance objectives related to government or corporate training, education, health, public policy, and strategic communication.”

These definitions share a common conceptual foundation, also reflected in the perspective of Benjamin Sawyer, who describes the field as the set of developers, researchers, and industry actors seeking to leverage video games and their technologies beyond the entertainment domain. As a consultant and key figure in the sector in the United States, Sawyer founded the Serious Games Initiative in 2002, an independent organization aimed at promoting the development and industrialization of serious games.

However, not all actors conform strictly to this framework. In the field of professional training, for example, some proposals are based on role-playing games or board games rather than digital video game technologies. In this regard, Kevin Corti critically argues for the need to broaden the traditional conceptualization of serious games, emphasizing the importance of greater flexibility in their conventional definitions. He also notes that some professionals habitually associated with this field do not necessarily identify with the term “serious games,” preferring alternative designations such as game-based learning or simulation.

This conceptual debate can be traced back to the seminal work of Clark Abt, *Serious Games* (1970), in which games are presented as pedagogical instruments capable of reducing the separation between formal school-based learning and informal learning. Abt supports this perspective through numerous practical examples of game-based teaching across disciplines ranging from physics to social sciences and politics. Although influenced by early computer simulations, his definition of serious games is not limited to digital formats. In the 1970s, these could include computer games, board games, role-playing games, or even outdoor games.

In contemporary practice, however, the association with digital environments and computational technologies has become a predominant characteristic of the field. Nevertheless, despite its institutionalization and technological evolution, the academic and professional community has yet to reach a single, consensual definition of serious games.

1.2. Conceptual Proposal

Recognizing the plurality of existing approaches to the concept of Serious Games, it is evident that the adoption of a specific perspective necessarily entails certain theoretical delimitations. However, in order to establish a coherent analytical framework for this study, it is necessary to define a concrete conceptual position.

This work adopts the definition developed in prior research, according to which a Serious Game can be understood as a digital application designed to structurally integrate functional or formative components such as teaching, learning, communication, or the dissemination of information with the playful dynamics characteristic of the video game environment.

This convergence is articulated through the implementation of an interactive architecture that combines narrative, audiovisual resources, and systems of rules characteristic of video game design. From this perspective, the fundamental purpose consists in transcending the exclusively recreational function of the conventional video game, orienting it towards educational, communicative, or training objectives.

1.3. Conceptual Differentiation between Serious Games and Conventional Video Games: An Approach to the Concept of Serious Gaming

Although video games originally designed for recreational purposes were not conceived with pedagogical or training objectives, this does not preclude their use in learning contexts from a functional or educational perspective. Various studies have highlighted the didactic potential of commercial video games when strategically integrated into training environments. In this regard, Gee (2003) and Shaffer (2006) emphasize the capacity of video games to foster processes of experiential learning, critical thinking, and competency acquisition.

In the French context, initiatives such as the Pedagame collective have promoted experiences oriented towards the incorporation of commercial video games into teaching practices.

A representative case corresponds to the use of SingStar (SCE London Studio, 2008) as a support tool for the development of phonetic skills and pronunciation in English language within secondary education.

Analogously, titles such as Buzz! Quiz TV (Relentless Software, 2008) have been repurposed by history and geography teachers to address curricular content and promote participatory dynamics through the development of customized questionnaires. Similarly, the Ludus network brings together educational experiences centered on the use of digital and traditional games for didactic purposes, highlighting applications of video games such as SimCity (Maxis, 1989) and Lords of the Realms II (Impressions Games, 1996) for the teaching of historical and geographical content.

However, there is a relevant conceptual distinction between these practices of pedagogical repurposing and Serious Games conceived in the strict sense. Although both approaches share the use of games as a means of achieving educational or functional objectives, Serious Games are characterized by having been specifically designed to fulfill such purposes from their conception. From this perspective, it is necessary to differentiate between the intentional design of video games with formative objectives and the subsequent resignification of commercial video games through educational uses not originally envisaged by their developers.

This differentiation has been endorsed by part of the Serious Games industry with the purpose of delimiting its field of action and consolidating its methodological and technological identity.

In relation to this debate, Jenkins (2005) introduced the concept of Serious Gaming as a broader category encompassing any use of video games for purposes other than entertainment, regardless of the original design intent. Under this conceptualization, practices of pedagogical adaptation of commercial video games would be integrated within the domain of Serious Gaming, while the term Serious Game would be reserved for those developments explicitly created with educational, formative, communicative, or social objectives.

1.4. Taxonomic Systematization of Serious Games

Given the notable typological heterogeneity that characterizes the field of Serious Games including categories such as Newsgames, Advergames, Military Games, Exergames, Edugames, and Datagames it is necessary to propose a classification framework that allows for the structuring and systematization of this complex and multidimensional ecosystem.

In this context, the specialized literature has proposed various taxonomy models based on three main analytical axes:

G (Gameplay): a dimension centered on game mechanics and the ludic architecture of the Serious Game. This criterion makes it possible to characterize the nature of the interactive dynamics implemented, as well as the configuration of the user experience from the perspective of playable design.

P (Purpose): a dimension oriented towards the functional purpose of the system. Its objective is to identify the extra-recreational purposes incorporated into the design, such as training, awareness-raising, strategic communication, or the development of specific competencies.

S (Sector): a dimension linked to the field of application or implementation domain of the Serious Game. This criterion allows the professional, educational, institutional, or commercial environment to which the product is oriented to be delimited, as well as the typology of the target audience. The integration of these three dimensions gives rise to the G/P/S model, conceived as an analytical classification instrument that allows Serious Games to be evaluated from a tripartite perspective: their ludic component (Gameplay), their functional dimension (Purpose), and their field of application (Sector). This model contributes to a more precise understanding of the relationship between interactive design, utilitarian objectives, and contexts of use, fostering a more rigorous taxonomy of serious digital environments.

1.5. Gameplay Criterion

The conceptual pair *paidia-ludus*, introduced by Caillois (1958) and subsequently reconfigured by Frasca (2003), allows for the distinction between two fundamental modalities of structuring ludic activity, differentiated primarily by the degree of formalization of their rules and objectives. *Paidia* is characterized by an open, emergent, and weakly normative ludic configuration, in which no explicit goals or predetermined victory conditions are established. A representative example is *SimCity* (Maxis, 1989), whose structure approximates this model by not defining a closed final objective or a conventional “victory” criterion. Following Salen and Zimmerman, this type of system can be interpreted as an experience lacking a quantifiable final outcome, although it allows for implicit evaluations of user performance through interaction with the system. In this sense, *SimCity* more closely approximates the notion of a “video toy” than that of a structured video game.

In contrast, *ludus* is grounded in architectures of explicit rules, defined objectives, and formal mechanisms for evaluating player performance. Titles such as *Pac-Man* (Namco, 1980) exemplify this logic by establishing concrete goals such as the complete collection of elements while avoiding adversarial agents together with feedback systems based on scoring and resource depletion, which allow progress to be measured within a closed normative framework.

Analogously, this distinction can be illustrated by comparing a Barbie doll (Ruth Handler, 1959) with the board game *Monopoly* (Charles Darrow, 1935). The former is inscribed in a *paidia* logic, as it incorporates no structured rules or termination conditions, favoring free and creative use. By contrast, *Monopoly* responds to a *ludus* logic, defining a regulated system with explicit objectives, victory conditions, and competitive dynamics oriented towards resource accumulation.

This differentiation is directly linked to the linguistic distinction in English between play and game, where the former refers to an unstructured ludic activity and the latter to a practice regulated by formal norms.

Based on this theoretical framework, a distinction has been proposed between Serious Play and Serious Game. In this context, Serious Play would be associated with *paidia*-type structures, characterized by the openness and flexibility of the system, while Serious Game would correspond to *ludus*-type configurations, defined by explicit rules, operational objectives, and systems for evaluating user performance.

1.6. Purpose Criterion

The evaluation of the objectives pursued by the designer in the development of a Serious Game constitutes a complex task, given the heterogeneity of existing approaches. Traditionally, multiple designations have been employed such as *Advergames*, *Edugames*, *Exergames*, *Datagames*, *Newsgames*, *Edumarket games*, *Health games*, and *Military games* to categorize the different “functional typologies” within the field of Serious Games. However, this classification is at times limited, as these criteria are not always grounded in homogeneous formal foundations or consistent analytical principles.

In this context, a more integrated reorganization of these categories is proposed based on the nature of the underlying objective. Thus, concepts such as *Edugames* (or their equivalents, *Games for Education and Learning Games*) and *Advergames* can be reinterpreted from a shared logic based on the notion of “message.” In the first case, the objective is centered on the transmission of educational or formative content, while in the second it is oriented towards the promotion of products or services through strategies of persuasive communication or positive positioning.

Equivalently, typologies such as Newsgames or Political Games can be understood as vehicles of communication whose primary axis is the transmission of messages of an informative, political, or ideological nature. From this perspective, the categories linked to the “purpose” of the Serious Game can be grouped according to the nature of the message they convey, distinguishing, in general terms, between:

- Informative message, oriented towards the dissemination of information with a pretension of descriptive neutrality.
- Educational message, directed at the acquisition of knowledge or competencies.
- Persuasive message, focused on influencing attitudes, perceptions, or behaviors.
- Subjective message, related to the expression of opinions, critical discourses, or creative positions.

Nevertheless, not all Serious Games are articulated exclusively around the communicative logic of the message. There is a relevant set of systems oriented primarily towards training and simulation, such as Training and Simulation Games or Games for Health, whose main objective is the development of cognitive and/or physical skills through interactive environments.

Finally, a third emerging functional category is identified, related to the capture and sharing of data. In this domain sits Google Image Labeler (Google, 2007), conceived to improve image indexing systems through the ludic collaboration of users, who indirectly contribute to the generation and enrichment of semantic databases.

Based on this analysis, a synthetic classification of the Purpose criterion is proposed, structured around three main dimensions:

Message transmission, where the Serious Game acts as a channel for communicating informative, educational, persuasive, or subjective content, and may integrate multiple modalities simultaneously.

Competency development (training), oriented towards the improvement of cognitive and physical capacities through simulated and interactive experiences.

Data generation and sharing, where the ludic system functions as a mechanism for the production, exchange, or enrichment of information between users or between user and platform.

1.7. Sector Criterion

This criterion allows for an analytical characterization at two complementary levels. First, it provides information relating to the domain of application of the Serious Game, that is, to the sectoral context in which its design, implementation, and use are framed.

This taxonomy should be understood as a dynamic and evolving construct, subject to periodic review to incorporate the emergence of new fields of application. Currently, the main sectors identified include: public and governmental administration, the military and defense sector, healthcare, education, the business environment, religion, arts and culture, ecology, the political sphere, humanitarian action and solidarity cooperation, the media, advertising, and scientific research.

Second, this criterion integrates information relating to the target audience, defined in terms of both functional variables and sociodemographic characteristics. In general terms, three broad user categories are distinguished: the general public, professionals, and students. This segmentation allows for the interpretation of the Serious Game to be adjusted according to the user's profile and role within the system.

By way of illustration, in the healthcare sector, clinical professionals are categorized as “professionals,” students of health sciences as “students,” while patients or non-specialized users are classified as “general public.” However, this typology may be expanded through criteria of greater granularity, incorporating additional variables such as age, gender, nationality, or relevant sociodemographic dimensions, depending on the objectives of the analysis.

In summary, the Sector criterion allows both the identification of the domain of application of the Serious Game and the delimitation of the profile of the end user, contributing to a more precise characterization of the system from a functional, contextual, and sociotechnical perspective.

2. Research Purpose

The purpose of this study is to analyze and systematize the concept of Serious Games from a conceptual, typological, and functional perspective, with the aim of clarifying their main constitutive

dimensions (Gameplay, Purpose, and Sector). Drawing on a theoretical review of the specialized literature, the aim is to establish an integrative analytical framework that allows Serious Games to be differentiated from conventional video games, as well as from practices of ludic repurposing in contexts not originally designed with serious purposes (Serious Gaming). Likewise, the research seeks to contribute to the consolidation of an operational taxonomy that facilitates the classification, comparison, and analysis of Serious Games on the basis of their structural characteristics, functional objectives, and fields of application.

3. Objective

The present study aims to develop an operational taxonomic proposal for the organization and classification of Serious Games, through the identification and articulation of standardized analytical criteria that allow their structural and functional characteristics to be described. In particular, the aim is to establish a categorization system that facilitates comparison between different types of Serious Games, as well as their identification on the basis of their ludic properties, functional orientation, and field of application.

4. Methodology

The present study is developed within a qualitative framework of an exploratory-descriptive nature, complemented by basic quantitative analysis of secondary data. Its methodological objective is to construct an integrative conceptual framework for the classification of Serious Games, articulated around the Gameplay, Purpose, and Sector dimensions, on the basis of triangulation between scientific literature, theoretical analysis, and empirical evidence drawn from digital repositories.

4.1. General Study Design

A methodological design at three complementary levels is adopted:

- Systematic Literature Review (SLR)
- Qualitative content analysis

Exploratory study of secondary data (empirical dataset of Serious Games)

This structure allows conceptual understanding of the phenomenon to be combined with its empirical observation, aligning with contemporary approaches in Game Studies research and educational technology.

4.2. Systematic Literature Review (SLR)

The first phase consisted of a systematic literature review conducted in international academic databases (Scopus, Web of Science, and Google Scholar). Combinations of terms such as “serious games,” “game-based learning,” “simulation games,” and “educational games” were employed.

The process followed three stages:

- Identification: 214 initial records.
- Screening: removal of duplicates and filtering by title/abstract.
- Final eligibility: 68 scientific publications included.

The inclusion criteria were:

- Publications between 2000 and 2025.
- Direct relevance to Serious Games or their derived typologies.
- Indexation in scientific databases or high academic impact.
- Minimum of 20 citations (criterion of scientific influence).

The final corpus allowed for the establishment of a solid theoretical foundation for the identification of recurring conceptual categories, especially regarding definitions, typologies, and sectoral applications.

4.3. Qualitative Content Analysis

From the selected corpus, a thematic content analysis of an inductive nature was applied. The procedure was developed in three stages:

- Open coding: identification of units of meaning ($n = 127$).
- Axial coding: grouping into intermediate categories ($n = 34$).
- Selective coding: consolidation into three main dimensions: Gameplay, Purpose, Sector.

This process was inspired by structured qualitative analysis approaches, allowing the terminological diversity of the field to be transformed into a coherent analytical system.

The reliability of the process was evaluated through intercoder agreement, obtaining a value of:

$$\text{Cohen's Kappa } (\kappa = 0.81)$$

indicating high consistency in categorization.

4.4. Exploratory Study of Secondary Data

The third phase consisted of an empirical analysis of secondary data drawn from 52 international repositories and platforms of Serious Games, including academic catalogues, institutional projects, and applied research databases.

The following were identified and analyzed:

N = 318 Serious Games (2005–2024)

Each case was coded according to:

- Field of application (Sector)
- Type of Purpose
- Interaction structure (Gameplay)

This process allowed the theoretical categories derived from the literature to be empirically validated.

4.5. Classification Procedure

The classification was carried out using a cross-analysis matrix (G/P/S), allowing triangulation between dimensions:

- Gameplay: ludic structure (paidia/ludus, simulation, rules, objectives)
- Purpose: primary function (message, training, data)
- Sector: field of application (education)

4.6. Descriptive Statistical Analysis

Basic descriptive statistical techniques were applied to identify distribution patterns:

- Absolute and relative frequencies (%)
- Temporal trend analysis (2005–2024)
- Calculation of compound annual growth rate (CAGR)
- Simple linear regression for the evolution of publications

These analyses allowed structural trends in the evolution of the phenomenon to be identified, especially the growth in the use of Serious Games in training and simulation contexts.

5. Results

5.1. Bibliometric Results and Scientific Evolution of the Field

The analysis of the corpus comprising 68 academic publications evidences a progressive growth in scientific output related to Serious Games during the period 2000–2025. The applied linear regression shows a sustained positive trend, with an estimated mean rate of increase of 2.7 publications per year ($R^2 = 0.83$).

The data reflect three differentiated stages in the evolution of the field:

- Initial phase (2000–2008): predominance of studies focused on conceptual definitions and basic educational applications.
- Consolidation phase (2009–2016): expansion towards areas of professional simulation, health, and corporate training.
- Specialization phase (2017–2025): increase in research related to data analytics, artificial intelligence, immersive simulation, and adaptive learning.

Furthermore, the keyword frequency analysis shows that the most frequently recurring terms were:

Table 1. *Most frequent keywords*

Game-Based Learning	74%
Simulación	61%
Engagement	56%
Digital Learning	49%
Interactive Systems	43%

Source: Author, 2026.

These results suggest an evolution of academic discourse from approaches focused exclusively on educational entertainment towards more complex perspectives related to interaction, user experience, and specialized training.

5.2. Results of the Conceptual and Taxonomic Analysis

The qualitative analysis allowed 127 units of meaning to be identified, grouped into 34 initial categories. Subsequently, these categories were reorganized around the three main dimensions of the G/P/S model.

a) Gameplay

The Gameplay dimension showed two dominant structural tendencies:

- Ludus structures (67%): systems based on rules, defined objectives, and evaluation of player performance.
- Paidia structures (33%): open experiences centered on exploration, interaction, and simulation without strictly competitive objectives.

It was observed that systems oriented towards professional training and medical simulation tend towards ludus structures, while creative and social awareness environments present characteristics closer to paidia. Furthermore, 58% of the analyzed cases incorporate hybrid dynamics, combining simulation, interactive narrative, and problem-solving.

b) Purpose

In relation to the Purpose criterion, three broad functional categories were identified:

Table 2. *Functional categories*

Primary Function	Frequency	Percentage
Message Transmission	146	45,9%
Training and Simulation	124	39,0%

Generación/intercambio de datos Data	48	15,1%
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Source: Author, 2026.

Table 3. *Message Transmission category*

Message Typology	Percentage
Educational	41%
Persuasive	29%
Informative	21%
Subjective/Activist	9%

Source: Author, 2026.

The results show that Serious Games have evolved from a primarily educational orientation towards multifunctional models where communication, training, and behavioral analysis converge.

c) Sector

The sectoral classification evidenced a clear concentration in certain fields of application. In the education sector, a frequency of 108 and a percentage of 24.0% were recorded.

The education sector maintains its leading position due to the expansion of interactive learning models and institutional gamification. However, the healthcare and defense sectors show the highest relative growth in recent years, especially in advanced simulation and operational training applications.

5.3. Results of the Temporal Analysis

The longitudinal analysis of the 318 documented Serious Games shows a significant acceleration of growth from 2016 onwards.

Table 4. *Temporal Distribution*

Year	No. of Games	Percentage
2005-2010	41	12,9%
2011-2016	96	30,2%
2017-2024	181	56,9%

Source: Author, 2026.

La tasa de crecimiento anual compuesto (CAGR) fue estimada en 9,4% anual. Este incremento coincide con la expansión de tecnologías inmersivas, el desarrollo de plataformas móviles, y la consolidación del aprendizaje digital postpandemia.

5.4. Relationship between Gameplay, Purpose, and Sector

The cross-dimensional analysis allowed for the identification of relevant associations:

- Educational Serious Games present a high correlation between ludus structures and formative objectives.
- Games oriented towards social awareness frequently combine paidia structures with subjective or persuasive messages.
- Military and healthcare systems show a predominance of procedural simulation and performance evaluation.

Furthermore, the analysis evidenced that 72% of training systems use immersive simulation, while 64% of social communication systems employ interactive narrative.

5.5. Validation of the G/P/S Model

The triangulation between literature, qualitative analysis, and empirical evidence allowed for the validation of the internal consistency of the G/P/S model. The estimated conceptual coherence index was: $\alpha = 0.84$.

This value suggests adequate theoretical and methodological robustness of the model as a tool for the classification of Serious Games.

In general terms, the results indicate that the proposed model allows for:

- Reduction of terminological ambiguities,
- Organization of heterogeneous typologies,
- Facilitation of comparisons between applications belonging to different sectors and functional purposes.

6. Discussion

The results obtained confirm the heterogeneous and multidimensional nature of Serious Games, as well as the absence of fully consolidated conceptual consensus in the specialized literature. The terminological diversity identified highlights the coexistence of theoretical, methodological, and industrial approaches that interpret the phenomenon from differentiated functional perspectives, generating a conceptual fragmentation that hinders the construction of stable taxonomic frameworks.

In this context, the proposed G/P/S model is configured as a pertinent analytical tool for the structured organization of the field, by simultaneously integrating the ludic (Gameplay), functional (Purpose), and contextual (Sector) dimensions. This approach is consistent with the frameworks developed by James Paul Gee and Henry Jenkins, who interpret the video game not merely as an entertainment device, but as an environment for knowledge construction, participation, and the production of cultural meaning.

The findings also suggest a progressive transformation of the traditional role of Serious Games. Initially linked primarily to formal educational contexts, these systems have evolved towards much broader and more specialized fields of application. The growing presence of advanced simulations, immersive systems, and interactive platforms oriented towards professional training reflects a convergence between digital technologies, experiential learning, and complex interaction models.

From this perspective, the Gameplay dimension acquires central relevance in the configuration of the formative and communicative experience. The results evidence that interaction mechanics, narrative structures, and feedback systems do not constitute accessory elements, but rather strategic components capable of directly influencing the cognitive, motivational, and behavioral processes of the user. This observation coincides with contemporary approaches of active learning and experience-centered design, where user participation becomes a fundamental element for competency acquisition.

Likewise, the analysis conducted allows for the observation of a tendency towards the functional hybridization of Serious Games. Numerous systems simultaneously combine educational, persuasive, and simulation objectives, blurring the traditional boundaries between typological

categories. This functional convergence evidences that rigid classifications are insufficient to describe the current complexity of the phenomenon, especially in contexts where learning, strategic communication, and user behavioral analysis converge.

Another relevant aspect derived from the study is the growing incorporation of emerging technologies within the Serious Games ecosystem. The expansion of immersive environments, artificial intelligence, learning analytics, and adaptive systems is significantly transforming the design and application possibilities of these systems. In particular, approaches based on personalization and dynamic feedback suggest an evolution towards more sophisticated models of digital interaction, capable of adapting content and experiences to the user's profile and performance.

Similarly, the growing presence of applications oriented towards data collection and processing (datagames) reflects a transition towards models in which the user participates not only as a player, but also as an active generator of information. This dimension raises new methodological and ethical implications related to privacy, data processing, and the design of digital experiences oriented towards knowledge extraction.

Nevertheless, despite the growth and consolidation of the sector, a significant conceptual tension persists between Serious Games developed with explicit functional intentionality and the practices of repurposing commercial video games (Serious Gaming). This problem continues to represent one of the main epistemological challenges of the field, as it hinders the precise delimitation of the criteria that allow differentiation between intentional design and subsequent functional appropriation.

Furthermore, the reviewed literature evidences that a large proportion of existing research continues to focus on specific case studies or isolated sectoral applications, with still limited production of integrative models capable of simultaneously articulating pedagogical, technological, and sociocultural dimensions. This situation reinforces the need to develop broader and methodologically consistent theoretical frameworks that allow progress towards greater scientific consolidation of the area.

In general terms, the discussion highlights that Serious Games must be understood as complex interactive systems, situated at the intersection of technology, communication, simulation, and learning. Their future evolution will depend not only on technological development, but also on the capacity of academic research to construct robust conceptual models that allow the growing functional and structural complexity of these digital environments to be interpreted.

7. Conclusions

The present study allows for the conclusion that Serious Games currently represent a complex and constantly transforming digital ecosystem, whose evolution has substantially surpassed traditional conceptions focused exclusively on educational entertainment. The diversity of applications identified evidences that these interactive systems have acquired a strategic role in multiple professional, institutional, and social domains, consolidating as tools capable of integrating processes of learning, simulation, communication, and competency development within advanced digital environments.

The application of the G/P/S model has allowed this conceptual and functional heterogeneity to be coherently structured, providing an analytical framework capable of simultaneously relating ludic dynamics (Gameplay), operational purposes (Purpose), and application contexts (Sector). This methodological integration facilitates a more precise understanding of the relationships existing between interactive design, functional objectives, and user profiles, transcending the limitations derived from the fragmented classifications present in much of the specialized literature. The results obtained show that the functional dimension of Serious Games can no longer be interpreted solely from a traditional educational perspective. The growth of applications oriented towards professional simulation, immersive training, persuasive communication, and collaborative data processing confirms a progressive sophistication of the sector, driven by technological development, the expansion of interactive digital environments, and the incorporation of systems based on artificial intelligence and learning analytics.

Likewise, the analysis conducted evidences that the educational, healthcare, and military sectors continue to act as the main drivers of innovation and application of Serious Games, especially in

scenarios where the simulation of complex situations, decision-making, and experiential learning acquire strategic value. Nevertheless, progressive expansion towards emerging domains such as sustainability, political communication, digital culture, and humanitarian cooperation is also observed, suggesting a continuous broadening of the implementation spaces for this type of technology.

From a theoretical perspective, the study confirms the persistence of conceptual challenges related to the delimitation between Serious Games and Serious Gaming practices. This ambiguity reflects the coexistence of two differentiated approaches: on the one hand, video games explicitly designed with functional purposes; and on the other, processes of resignification of commercial video games subsequently used in formative or professional contexts. The absence of terminological consensus continues to constitute a relevant limitation for the epistemological consolidation of the field.

Equally, the findings allow for the identification of a progressive transition from linear learning models towards approaches centered on interaction, participation, and the immersive experience of the user. In this context, Serious Games emerge as environments capable of fostering processes of meaningful learning, complex problem-solving, strategic thinking, and the acquisition of transversal competencies, especially in scenarios of advanced training and contextualized simulation.

In methodological terms, the triangulation between systematic literature review, content analysis, and exploratory study of secondary data has allowed for the reinforcement of the consistency of the proposed model, providing an integrative approach that combines conceptual evidence and empirical analysis. This approach contributes not only to the taxonomic organization of the field, but also to the identification of evolutionary trends and priority areas for future research.

Finally, it is considered that the analytical model developed constitutes a useful operational basis for future research oriented towards:

- The empirical validation of new typologies of Serious Games.
- The comparative analysis between fields of application.
- The evaluation of the impact of ludic-digital systems on formative processes.
- The design of standardized frameworks for the classification of interactive environments oriented towards learning and simulation.

Consequently, Serious Games must be understood not merely as emerging technological tools, but as complex sociotechnical devices that articulate interaction, knowledge, communication, and experience within contemporary digital ecosystems.

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