

# Editorial: building an inclusive taxonomy of video games for edugame design

Michele Domenico Todino <sup>1</sup>

<sup>1</sup> Department of Humanities, Philosophy and Education of the University of Salerno;  
mtodino@unisa.it

**Abstract:** This work addresses the need for an inclusive taxonomy of video game genres, emphasizing their potential as educational tools. Previous studies have highlighted the educational benefits of video games in enhancing cognitive and social skills, but there is a gap in literature regarding a comprehensive classification that aligns with the main educational methodologies. This work proposes a refined taxonomy that categorizes video games into primary genres and subgenres, highlighting their mechanics, narratives, and educational applications. This taxonomy includes a novel aspect, than those generally used by the press covering video games, a part detailing learning types and methodologies associated with each genre, thus emphasizing their educational value. The educational implications of video games are explored, demonstrating how different genres can enhance various learning outcomes, from skill-based learning in action games to narrative and analytical skills in adventure games.

**Keywords:** Game-based learning; video game taxonomy; interactive learning; inclusive education; edugames.

## 1. A brief prologue: video gaming-related biases and prejudices in education

The study presented in this work builds upon the discussions from the session about Immersive Technologies, Inclusion, and Teacher Training in Digital Education held during the third edition of the conference of *Il videogioco in Italia. Archeologia del presente: il videogioco tra passato e futuro* <sup>1</sup>, in 2024. To fully understand the meaning of this work and the motivation behind its writing, it is important to know the themes that stimulated its contents, and they are to be exact the subjects of the session of which the author was chair.

However, those interested in taxonomy can go directly to the next paragraph. For those who were not present in this session, but are interested in the topics covered at the conference, it is important to know that it addressed several topics, including:

---

<sup>1</sup> Il videogioco in Italia. Archeologia del presente: il videogioco tra passato e futuro. Plenary session 1 hour, 22 second.  
<https://www.youtube.com/live/ITwLBdZb85E>

- 1) the role of video games in education through reflective and practical approaches to teacher training, as proposed by Dalila Forni of Link Campus University, highlighted the importance of having inclusive criteria for selecting educational video games. This was essential because it ensured that the games chosen were accessible and beneficial to a diverse student population. By integrating inclusivity, teachers provided learning opportunities that catered to different learning styles, abilities, and backgrounds, promoting equity in the classroom. This approach not only enhanced student engagement but also supported differentiated instruction, helping all students to achieve their full potential. From this point, it emerges that the selection of inclusive games improves student engagement as it responds to their specific needs and interests. A well-designed taxonomy could help edugames designers build games that engage a variety of users, optimizing the educational experience. This element is a first step in overcoming prejudices and preconceptions related to video games in education and defining the parameters for saying when a video game is going in the direction of inclusion and when it is not;
- 2) it also addressed inclusive video game design based on Di Paolo and Sessa's concept of simplicity under the scientific coordination of Professor Maurizio Sibilio from the University of Salerno. The concept of simplicity (Sibilio, 2014; 2016; 2020; Di Tore & Alii, 2020) emphasized designing games that balanced simplicity and complexity, making them accessible yet challenging. Inclusive criteria in this context ensured that educational games were designed with Universal Design for Learning principles (Aiello & Alii, 2014; CAST, 2018), making them usable by individuals with varying abilities without the need for adaptation. This inclusive approach fostered a learning environment where all students could participate and benefit equally, thus promoting a sense of belonging and reducing barriers to learning (Aiello, 2024); The concept of simplicity (along with a view of the video game environment in terms of UDL) is fundamental to an inclusive taxonomy, as it allows games to be classified that are accessible to a broad spectrum of users without sacrificing the level of challenge. This element is a second and important step in defining the parameters that make a video game product inclusive because one can build on what has already been studied with respect to inclusive spaces in real-world contexts, through the application of simplicity and UDL, and translate it into virtual graphics engines. The taxonomy should therefore consider how games balance these two elements to ensure that they are appropriate for students with different cognitive and physical abilities;
- 3) additionally, the session examined the notion of playfulness between physical and digital games, as discussed by Viola and Veneruso under the scientific coordination of Professor Diana Di Gennaro, also from the University of Salerno. Incorporating inclusive criteria in the selection of educational video games encouraged a seamless integration of playfulness across both physical and digital realms. This ensured that students who had preferences or restrictions regarding physical activities could still engage meaningfully through

digital play, and vice versa. By considering inclusivity, educators created a balanced and comprehensive learning experience that respected and valued the diversity of students' abilities and preferences. An inclusive taxonomy of video games should consider how educational games manage to integrate physical and digital gaming experiences, allowing students to choose between different modes of interaction, depending on their preferences or physical limitations. This flexibility is critical to ensure that all students can participate;

- 4) Another focal point, issued from the conference session, was the educational potential of video games in juvenile penitentiary contexts, analyzed by Moccia and Promentino under the scientific supervision of Professor Fausta Sabatano, also from the University of Salerno. In penitentiary contexts, the use of inclusive educational video games was particularly impactful. These environments often involved individuals with varied educational backgrounds and learning needs. Inclusive criteria ensured that the chosen video games addressed the diverse needs of this population, providing equitable access to educational opportunities that could aid personal development. Such an approach not only helped in skill-building and education but also in fostering a sense of self-worth and community among inmates<sup>2</sup>; Inclusive video games used in settings such as prisons can promote skill enhancement, education, and even growth in emotional and social terms. A well-designed taxonomy could help identify games that not only teach “academic” or technical skills, but also promote a sense of self-worth and community building.

Each presentation, just described, addressed critical aspects of video game studies in education and each presentation lectured critical aspects of video game studies in education, highlighting the importance of inclusive criteria in selecting educational video games. These criteria ensure that the educational benefits of video

---

<sup>2</sup> As a corollary of this “not so brief” prologue you want to think about topic 4) for a second more: a brief side note pertains to the specific issue concerning video games in prisons, which warrant comprehensive treatment and a clear SWOT analysis to avoid demonization and to properly assess associated risks. In a 2015 article published in *Wired Italia* (Meggiato, 2015), questions arose in the aftermath of the terrorist attacks in France about whether online video game chats were utilized as a form of communication. This also prompted further discussion about the practice among video gamers of playing on pirated servers to avoid payment. This clarification delves into the misconception surrounding the alleged use of the PlayStation Network (PSN) in orchestrating the Paris attacks, while also exploring the broader implications of online gaming platforms in facilitating illicit communication, including potential exploitation by organized crime. It emphasizes the challenges posed by the vast array of games available on these platforms, which complicate consistent monitoring and detection, particularly given the encrypted nature of PSN communications. Beyond terrorism, this elucidation highlights the potential misuse of gaming networks by organized crime groups for coordinating illegal activities, leveraging the anonymity and encryption provided by these platforms to evade detection. Furthermore, it examines the use of video games in prison settings as a tool for mitigating stronger addictions but underscores the importance of stringent security measures to prevent unauthorized communication between inmates and external contacts. Ultimately, the statement advocates for a balanced approach that leverages digital surveillance and comprehensive intelligence to identify and mitigate suspect behaviors while harnessing the rehabilitative potential of gaming platforms under strict supervision.

games are accessible to all learners, regardless of their abilities, backgrounds, or contexts, thus promoting a more inclusive and equitable educational environment.

In addition to the four points summarized before, several other topics contributed to the development of this work.

Also in the plenary session of the conference *Il videogioco in Italia. Archeologia del presente: il videogioco tra passato e futuro*, significant contributions to this work were made through the talks of Alfredo Di Tore and Alfonso Amendola. The following are the key ideas that hold particular relevance for this work:

- 1) as Professor Alfredo Pio Di Tore reminded in his opening talk titled *Pac-Man is More Like Life Than Chess: lo spazio metadisciplinare del videogioco*, The term “new media” is often used to describe something that has been around for more than fifty years. Referring to long-established forms of media as “new media” is misguided because media such as video games, the Internet, and certain forms of virtual reality have a substantial history. The term can undermine the perception of ongoing innovations, cause confusion for younger generations for whom these media are integral to everyday life, and ignoring their historical context diminishes our understanding of their evolution and societal impact. As emphasized by Alfredo Di Tore, these games continue to evolve in ways that reflect contemporary life and culture more profoundly than traditional games (like chess), thereby urging us to reconsider our terminology and adopt a more nuanced and accurate perspective. Paradoxically, however, these games, like all digital technologies, suffer from premature obsolescence (Malinconico, 2021, 2023). A gap is apparent from this statement: for more than fifty years, video games have existed but it seems that they are not taken seriously enough to create a taxonomy beyond the needs of the trade magazines that promote the sales of these cultural products;
- 2) while Professor Alfonso Amendola provides an explanation for the rationale that marginalizes video games by grouping them with comics and other media, he delves into this issue in more detail in his opening remarks as well as at the plenary session. Amendola highlights the profound prejudice surrounding the world of gaming, which is akin to the long-standing bias against comic books. Numerous explanations could be offered to account for this marginalization of comic books and the neglect of gaming, including the critical or scholarly approach to addressing these phenomena. This prejudice can be traced back to a fundamental aspect shared by both media: their roots in play and imagination, which are often relegated to a specific phase of our lives and subsequently devalued, as they are deemed unworthy of study once one transitions into adulthood. Fortunately, the widespread popularity of video games has nonetheless generated a strand of academic study called game studies, a field of research focused on the critical analysis of video games, highlighting their central role in the cultural sphere (Gee, 2006, Järvinen, 2008, Mäyrä, 2008, Shaw, 2010; Carbone, Fassone, 2020). However, this prejudicial perspective requires re-evaluation and reversal. In establishing a framework for the creation of a taxonomy of video games, various aspects must be considered. For instance, the context in which the games are played

is crucial—whether in public spaces such as arcades, as was common in the past, at home, or even in educational settings. Additionally, the social dimension of gameplay—whether individuals play alone, with friends, or with strangers—also requires examination. It is equally important to discuss the historical context, including when the first video games were developed and the reasons behind their creation. The range of questions pertinent to this field of study is extensive.

Well, there are many considerations that have emerged so far. Topics 1), 2), 3), and 4), alongside the considerations proposed by Amendola and Di Tore, do not merely narrow the research focus but instead open up new avenues for exploration. It is also difficult to determine exactly when video games came into existence. When did an oscilloscope turn into virtual tennis, or when was the first coin-op created? When did people start earning money through this medium? (Mosna, 2022). This can help us because in the early stages of the history of video games the first genres were created, which allowed the formation of groups of fans that fueled the various markets related to video games both in terms of the actual type (driving simulations, combat, strategy, etc.) and the location (home, bar, etc.) and the hardware in which the enjoyment of the game is done (pc, console, etc.). Another common theme in these contributions is the need to understand how to define the type of video game (in taxonomical terms), including its human-computer interaction models, multiplayer structures, and underlying learning methodologies, to assess their inclusiveness. A clear taxonomy is lacking; however, this gap is addressed by sector-specific journals. Here, we refer to Mosna's (2018) taxonomy and propose its extension with additional categories essential for educational use. These categories encompass learning styles, methodologies, and their potential to promote inclusivity.

## **2. Ludendo docere: exploring the educational potential of video games, from ancient wisdom to modern applications**

In this work we will deal with a contemporary topic but at the same time it is related to a very old world, the connection between gaming and education. All those involved in teaching should constantly keep in mind the ancient latin motto *ludendo docere*, which means “teaching having fun” (Angela, 2003, pp. 104-105). While it is not possible to attribute it to a specific author, tradition has handed down this maxim. If one succeeds in introducing the element of play (in the sense of interest), thus exciting individual motivations and igniting the brain, it is possible to multiply in a very highway the efficiency of information, teaching, and communication. The active engagement of an individual is a pivotal determinant in their cognitive processes. When an individual is personally invested in a task or endeavor, they are more likely to exhibit heightened levels of stimulation, active participation, enhanced retention of information, and facilitated learning outcomes (Ibidem). This area connects to a longstanding concept, the linkage between gaming and learning. Educators should continually remember the ancient latin motto *ludendo docere*, a maxim passed down through tradition despite the absence of a specific author. If one can successfully incorporate the element of play, understood here as fostering interest, it significantly enhances individual motivation and cognitive engagement, thereby increasing the efficiency of information transmission, teaching, and communication. Indeed, the active engagement of an individual is crucial for cognitive processes, leading to greater

stimulation, participation, retention, and learning outcomes (Ibidem). Nevertheless, as Alfonso Amendola emphasized in his opening talk at the plenary session, a profound prejudice persists against gaming, akin to the historical bias against comic books and all those media associated with childhood, also think about action figures<sup>3</sup> and all the gadgets that are related to the world of movies. This prejudice, which marginalizes comic books and overlooks gaming, stems from the common association of these media with play and imagination. These elements are often restricted to a particular stage of life and subsequently devalued, deemed unworthy of academic study upon reaching adulthood. This perspective needs a critical re-evaluation. Luckily, the extensive popularity of video games has given rise to a specialized area of academic inquiry: the game studies mentioned previously. This burgeoning field of research is dedicated to the critical examination of video games and aims to underscore their significant role within the cultural domain. However, this article is not dedicated to game studies but rather to the relationship between video games and the principles underlying such media in terms of learning factors. For example, overcoming a riddle within a narrative video game, organizing resources within a strategy game, having quick reflexes in an action game. In examining the educational potential of video games, it is essential to consider the taxonomies that have shaped the narrative, design, planning, and development of video games over the past forty years. The expanding gamer audience has intensified focus on the pedagogical, ethical, and didactic responsibilities in video game development and market dissemination. As video games are increasingly utilized for educational purposes, stakeholders in educational systems have started to question the educational responsibilities of technological products. This has prompted dialogues between large video game companies and education experts, although a formal declaration of the pedagogical, ethical, and didactic responsibilities of video games is still lacking, exactly as emphasized by Stefano Di Tore while coordinating the opening of this conference proceedings in 2024 at the University of Salerno

topic also explored in depth, from a business perspective, by Carlo Cuomo in his speech entitled *Level Up or Game Over? Il successo e le difficoltà dell'industria del Gaming nel 2024*. A useful framework for initiating this dialogue is the PEGI (Pan European Game Information) classification, which provides content descriptors (e.g., violence, vulgar language, discrimination, drugs, gambling, online, sex) and age categorization. This system attempts to outline the content offered by video games, aiding in the evaluation of their appropriateness for various age groups. Traditionally, the primary setting for playing video games was outside the educational environment, reinforcing the stigma of gaming as non-educational.

However, as Sibilio (2020) argues, despite some ethically contentious narratives, video games can be effectively utilized for educational interaction if used judiciously.

---

<sup>3</sup> these objects appear to be confined to it without being granted the dignity of developing into subjects worthy of academic study. The paradox, however, lies in the fact that the companies producing these cultural artifacts analyze them from a psycho-pedagogical perspective. One only needs to look at the American documentary series on Netflix, *The Toys That Made Us*, particularly the episode on He-Man, to grasp the extent to which toys intended for global production and distribution are thoroughly studied. one scene in the documentary was very touching, which is when children unknowingly play with action figures and are recorded, by a number of psychologists and marketing experts, to understand what they say and what they want from such games, hence He-Men's famous phrase "I have the power", said by a child who was playing.

Recent psychological studies indicate that video game activities enhance social skills such as problem-solving and decision-making (Ferguson, 2010; Szyck, Mohammadi, Münte, & Wildt, 2017), and the immersive nature of gaming aligns with Martha Nussbaum's (2001) concept of positional thinking, which involves adopting another's perspective (Gee, 2008; Hell & Melzer, 2021). Furthermore, the settings for gaming have evolved from single player to multiplayer environments, enabling shared virtual community participation, often with unfamiliar individuals. Over the years, avatars can serve as barriers or facilitators for participation in shared experiences, promoting learning through motivation, personalization, and self-evaluation (Teyssier, 2016).

Thus, institutions recognize the educational and inclusive value of video games (Di Tore, 2020), and it becomes crucial to encourage teaching strategies that develop cognitive flexibility among educators (Sibilio, 2014). These strategies should incorporate the most effective tools for promoting school inclusion. The video game taxonomies discussed herein can guide educators in developing inclusive teaching practices and provide straightforward tools for navigating the complexities of modern educational systems

### **3. Introduction to a new inclusive taxonomy of video game genres**

Various studies (Barr, 2018; Bediou et al., 2018; Gee, 2013; Mayer et al., 2019; Rivoltella, 2011; Zhao et al., 2019; Di Tore, 2020; Todino et al., 2022) have explored the potential of video games as functional tools for designing educational pathways that enhance specific skills in learners. Despite this focus, there remains a notable gap in the literature regarding a taxonomy of video games that emphasizes inclusivity. The evolution of video games from rudimentary simulations to sophisticated virtual experiences has precipitated the need for a nuanced classification system that reflects their diverse mechanics, narratives, and potential educational applications (Hookham & Nesbitt, 2019; Frøland & Alii, 2020; Holl & Melzer, 2021). Here it will be introduced an enhanced taxonomy of video game genres, designed to integrate traditional subgenres with contemporary learning methodologies, thereby illuminating the multifaceted roles these games play in both entertainment and education. The intersection of video games and learning has garnered significant academic interest, particularly concerning how game mechanics and narratives can facilitate various types of learning. As notes before, the integration of play into educational processes can significantly enhance cognitive engagement and learning efficiency. Similarly, the recognition of video games as a medium for developing social skills and cognitive flexibility underscores their potential as tools for both formal and informal education (Ferguson, 2010; Sibilio, 2014). Nevertheless, despite the increasing acknowledgment of their educational value, video games have habitually been subject to cultural discriminations (Amendola, 2024). These biases have traditionally marginalized video games as frivolous or purely recreational, overshadowing their capacity to serve as effective educational tools. Addressing this disparity necessitates a comprehensive taxonomy that not only categorizes video games by their mechanical and narrative features but also aligns these categories with relevant learning methodologies or at least, when the methodology cannot be described concisely, highlight which characteristics emerge in terms of the teaching-learning process for those using a certain video game. This taxonomy, shortly described by means of a multi-page table, aims to bridge the gap between video game design and educational theory by providing a structured framework that categorizes games based on their distinctive characteristics

and associated learning types. By delineating how specific game genres can support different educational objectives, this taxonomy could serve as a valuable resource for educators, game designers, and researchers interested in harnessing the pedagogical potential of video games. This taxonomy categorizes video games into primary genres such as action, adventure, role-playing video game, strategy, simulation, and others, further subdividing them into subgenres with distinct gameplay mechanics and thematic elements. Each subgenre is accompanied by a description of its peculiar characteristics and examples of representative games. A novel addition to this taxonomy, compared to Mosna's taxonomy (2018) and others used in trade journals, is the addition of a column detailing the learning types and methodologies that each genre can support. This column underscores the educational value of video games, highlighting how their unique attributes can facilitate various forms of cognitive, motor, and social learning.

#### 4. Educational Implications

Understanding the educational implications of video games necessitates recognizing the diverse ways in which they can engage and stimulate learners. For instance, action games requiring quick reflexes and coordination (Di Tore, 2016) can enhance skill-based learning, while narrative-driven adventure games can promote narrative learning and analytical skills. Role-playing games, with their emphasis on character development and strategic planning, align with methodologies that foster cognitive flexibility and problem-solving. Strategy games, which require resource management and strategic thinking, can serve as practical tools for teaching complex decision-making processes. This taxonomy also addresses contemporary concerns regarding the ethical and pedagogical responsibilities of video game design, as the growing use of games for educational purposes places increased emphasis on the development of games that are not only engaging but also educationally beneficial. By providing a detailed classification system, this taxonomy facilitates a better understanding of how different game genres can be utilized to achieve specific educational outcomes, thus promoting a more informed approach to game-based learning (Ciziceno, 2023). It is important to note that when a gamer learns, for example, how to manage a complex system through a strategic video game, this skill developed in the virtual environment will, to some extent, have an impact in the real world. Similarly, the ability to manage a group of people in an online game can enhance one's capacity to lead groups outside of the gaming context. Numerous examples could be provided, at least one for each row of the table that will be presented shortly. As the advert<sup>4</sup> said about the metaverse (and this also applies to a video game in general), it is a virtual space but its impact will be real.

---

<sup>4</sup> Spot Meta 2023 sul metaverso - L'impatto sarà reale. [https://www.youtube.com/watch?v=PQmZJJuU2EN4&ab\\_channel=Engage.it](https://www.youtube.com/watch?v=PQmZJJuU2EN4&ab_channel=Engage.it)

**Table 1.** A possible enhanced version of subdivision/taxonomy of the genres of the video game market (Mosna, 2018) with a new column for learning types and methodologies. Source: adapted from Source: adapted from Mosna (2018).

| Type   | Subgenre      | Peculiar characteristics<br>(via key concepts)                                                                                                                                                           | Examples                                                                                         | Learning Types and Methodologies                                                                                                            |
|--------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Action | Platform      | Require good eye-hand coordination (integration of visual perception and rapid response with keyboard, mouse, or gamepad); levels; obstacles; standard enemies and “bosses”; number of lives; score; map | Mario Bros (2D); Super Wonder Boy (2D); Prince of Persia (2D); Assassin’s Creed Brotherhood (3D) | <b>Skill-based Learning:</b><br>Develops motor skills and reflexes;<br><b>Problem-solving:</b><br>Encourages planning and spatial reasoning |
|        | Fighting game | Enemies controlled by AI; study enemy moves; martial arts; right timing; frenetic pace                                                                                                                   | Street Fighter II (2D); Mortal Kombat (2D); Marvel’s Avengers (3D)                               | <b>Strategic Learning:</b><br>Emphasizes tactical decision-making and pattern recognition                                                   |
|        | Shooter       | Use of firearms; two-dimensional and three-dimensional; “shoot ‘em up”; online play; egocentric view through player-driven character                                                                     | Call of Duty (3D); Rainbow Six Siege (3D); Unreal (3D); Doom (3D)                                | <b>Reflexive Learning:</b><br>Enhances reaction time;<br><b>Coordination:</b><br>Improves visual-spatial skills                             |
|        | Stealth       | Silent approach;                                                                                                                                                                                         | Tom Clancy                                                                                       | <b>Strategic</b>                                                                                                                            |

|                  |                   |                                                                                    |                                                                                                                             |                                                                                                                                                              |
|------------------|-------------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                   | mimicry; clumsy or noisy players lose                                              | Rainbow Six (3D); Metal Gear Solid V (3D); Hitman 3 (3D)                                                                    | <b>Learning:</b><br>Encourages stealth tactics and careful planning                                                                                          |
|                  | Survival          | Open world; secrets; degree of freedom; map; crafting                              | Minecraft (3D); Conan Exiles (3D); Far Cry Primal (3D)                                                                      | <b>Exploratory Learning:</b><br>Encourages resource management and creativity; <b>Critical Thinking:</b><br>Promotes problem-solving in dynamic environments |
| <b>Adventure</b> | Textual adventure | Similar to visual novel's predecessor gamebook; indie games                        | The Hitchhiker's Guide to the Galaxy (2D); Zork (text only); AI Dungeon (text only); Stories Untold: The House Abandon (2D) | <b>Narrative Learning:</b><br>Enhances reading comprehension and narrative skills; <b>Decision Making:</b> Fosters creative problem-solving                  |
|                  | Graphic adventure | Solving puzzles; narration; hotspot system; analyze environments; follow dialogues | Lucasfilm Games products (2D), e.g., Indiana Jones and the Fate of Atlantis                                                 | <b>Cognitive Learning:</b><br>Develops analytical skills; <b>Language Skills:</b><br>Enhances comprehension through dialogue                                 |

|  |                      |                                                                                                                   |                                                             |                                                                                                                                                                                                   |
|--|----------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                      |                                                                                                                   | (2D);<br>Hidden<br>Agenda<br>(3D);<br>Monkey<br>Island (2D) | and text analysis                                                                                                                                                                                 |
|  | Walking<br>simulator | Exploration<br>replaces<br>interaction; no<br>puzzles                                                             | Firewatch<br>(3D); The<br>Stanley<br>Parable (3D)           | <b>Exploratory<br/>Learning:</b><br>Encourages<br>immersive<br>exploration and<br>reflection                                                                                                      |
|  | Puzzle<br>Adventure  | Puzzles take<br>precedence over<br>adventure                                                                      | The Talos<br>Principle<br>(3D)                              | <b>Logical<br/>Learning:</b><br>Develops<br>problem-solving<br>skills; <b>Analytical<br/>Skills:</b> Enhances<br>logical reasoning                                                                |
|  | Visual novel         | Manga-style<br>drawings;<br>story-based<br>choices; no item<br>collection; often<br>involves dating<br>simulation | Ace<br>Attorney<br>(3D manga)                               | <b>Narrative<br/>Learning:</b><br>Enhances<br>understanding of<br>narrative<br>structures;<br><b>Decision<br/>Making:</b> Fosters<br>critical thinking<br>through<br>choice-based<br>interactions |
|  | Interactive<br>film  | Cinematic<br>sequences; live<br>action;<br>quick-time-event                                                       | Dragon's<br>Lair<br>(3D-cartoon)                            | <b>Reflexive<br/>Learning:</b><br>Enhances quick<br>decision-making;<br><b>Narrative<br/>Engagement:</b><br>Fosters                                                                               |

|                             |                                   |                                                                                                                                            |                                                                                                      |                                                                                                                                                                           |
|-----------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                                   |                                                                                                                                            |                                                                                                      | understanding of narrative flow                                                                                                                                           |
| <b>Action<br/>adventure</b> | Survival<br>horror/teen<br>horror | Good eye-hand<br>coordination;<br>analyze<br>environments;<br>follow dialogues;<br>Hitchcockian<br>techniques;<br>suspense; jump<br>scares | Until Dawn<br>(3D); The<br>Inpatient<br>(3D);<br>Resident<br>Evil (3D);<br>Alone in the<br>Dark (3D) | <b>Emotional<br/>Learning:</b><br>Develops stress<br>management;<br><b>Analytical Skills:</b><br>Enhances<br>environmental<br>analysis                                    |
|                             | Metroidvania                      | Labyrinthine map;<br>top view;<br>mandatory<br>exploration; revisit<br>locations                                                           | Metroid<br>(2D);<br>Castlevania<br>(2D)                                                              | <b>Exploratory<br/>Learning:</b><br>Encourages spatial<br>navigation;<br><b>Problem-solving:</b><br>Enhances<br>mapping and<br>strategy skills                            |
| <b>Sport</b>                | Simulative                        | Proto-genre;<br>follows sport rules;<br>realistic; real<br>physical laws                                                                   | FIFA (3D)                                                                                            | <b>Skill-based<br/>Learning:</b><br>Develops<br>understanding of<br>physical laws;<br><b>Strategic<br/>Thinking:</b><br>Encourages<br>tactical planning<br>and simulation |
|                             | Arcade                            | Simplified rules;<br>shorter durations;<br>inventive sports                                                                                | Street Hoop<br>(2D)                                                                                  | <b>Quick Learning:</b><br>Enhances rapid<br>decision-making;<br><b>Reflexive Skills:</b><br>Promotes<br>hand-eye<br>coordination                                          |
|                             |                                   |                                                                                                                                            |                                                                                                      |                                                                                                                                                                           |

|                          |               |                                                                                                                                                             |                                                                 |                                                                                                                                                       |
|--------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Role playing game</b> | Action RPG    | Real-time gameplay; good eye-hand coordination; fantasy/ sci-fi; dungeons; looting; levels; experience points; character classes; quests; crafting; freedom | Diablo (isometric 3D); The Witcher (3D); The Elder Scrolls (3D) | <b>Skill-based Learning:</b> Enhances motor skills;<br><b>Strategic Thinking:</b> Promotes long-term planning and character development               |
|                          | JRPG          | Alternation between exploration and combat with different graphics; influenced by Japanese culture                                                          | Final Fantasy series (2D-3D); Dragon Quest series (2D-3D)       | <b>Narrative Learning:</b> Enhances storytelling comprehension;<br><b>Strategic Learning:</b> Combines exploration and combat planning                |
|                          | Tactical RPGs | Turn-based combat; characters led like pawns; often based on famous systems                                                                                 | Baldur's Gate (isometric 3D)                                    | <b>Strategic Learning:</b> Emphasizes tactical decision-making and resource management                                                                |
|                          | Rougelike     | Randomized game map, enemies, and treasures                                                                                                                 | Rogue: Exploring the Dungeon of Doom (2D)                       | <b>Exploratory Learning:</b> Encourages adaptation to randomized environments;<br><b>Strategic Thinking:</b> Enhances planning with variable outcomes |

|                  |                                        |                                                                                        |                                                               |                                                                                                                                          |
|------------------|----------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Soulslike                              | High difficulty in combat                                                              | Dark Souls (3D)                                               | <b>Resilience Learning:</b><br>Develops persistence and problem-solving under pressure                                                   |
| <b>Strategic</b> | Turn-based strategy                    | Risk-style; increasing actions per turn; understanding world dynamics                  | Civilization (isometric 3D)                                   | <b>Strategic Learning:</b><br>Encourages long-term planning and situational analysis                                                     |
|                  | RTS                                    | Real-time strategy; actions against computer or players; rock-scissors-paper mechanics | Age of Empires (isometric 3D); WarCraft II (Isometric 3D)     | <b>Reflexive Learning:</b><br>Enhances real-time decision-making<br><b>Strategic Skills:</b><br>Promotes quick thinking and adaptation   |
|                  | Tower defense                          | Resource management: overview to stop enemies                                          | Plants vs. Zombies (2D)                                       | <b>Strategic Learning:</b><br>Develops resource management and strategic planning                                                        |
|                  | MOBA - Multiplayer Online Battle Arena | Symmetrical maps; limited passages; team game                                          | League of Legends (3D); Unreal Tournament (3D); Valorant (3D) | <b>Collaborative Learning:</b><br>Enhances team coordination and strategy;<br><b>Reflexive Skills:</b><br>Promotes quick decision-making |
| <b>Racing</b>    | Without subgenre                       | Coin-ops; kart racing; not very simulative;                                            | OutRun (2D with perspective);                                 | <b>Skill-based Learning:</b><br>Develops motor                                                                                           |

|                   |                  |                                                                                     |                                                                            |                                                                                                                                                  |
|-------------------|------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                  | entry-level for inexperienced players                                               | Mario Kart (3D); Gran Turismo (3D)                                         | skills and reflexes;<br><b>Fun Learning:</b><br>Provides accessible entry to game mechanics                                                      |
| <b>Simulation</b> | Management       | Building and maintaining ecosystems                                                 | SimCity (isometric 3D); Football Manager (2D)                              | <b>Cognitive Learning:</b><br>Encourages resource management and planning;<br><b>Strategic Thinking:</b><br>Enhances long-term planning          |
|                   | Life simulator   | Simulates biological and social activities; creatures evolve by natural selection   | The Sims (3D)                                                              | <b>Exploratory Learning:</b><br>Encourages understanding of social dynamics;<br><b>Creative Skills:</b><br>Promotes creativity in life scenarios |
|                   | Flight simulator | Military and civilian flight; demonstrates computer capabilities                    | Microsoft Flight Simulator (3D); DCS World (3D); F-15 Strike Eagle II (3D) | <b>Skill-based Learning:</b><br>Develops understanding of aerodynamics;<br><b>Technical Skills:</b><br>Enhances realistic simulation skills      |
|                   | Job simulator    | Work activity simulators; medical training; surgery; firefighting; kitchen; fishing | Farming Simulator (3D)                                                     | <b>Technical Learning:</b><br>Provides realistic job training;<br><b>Skill-based</b>                                                             |

|                               |                  |                                                                                                  |                                                         |                                                                                                                                                          |
|-------------------------------|------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                  |                                                                                                  |                                                         | <b>Learning:</b><br>Enhances specific occupational skills                                                                                                |
|                               | God simulator    | Actions of mythological deities; management of people with free will; clashes with other deities | Populous (isometric 3D); Black & White (isometric 3D)   | <b>Exploratory Learning:</b><br>Encourages understanding of mythology and society; <b>Strategic Thinking:</b><br>Enhances management and decision-making |
| <b>Rhythmic</b>               | Without subgenre | Rhythmic ability; actions in time with music; use of accessories                                 | Guitar Hero (3D); Dance Mat (3D)                        | <b>Skill-based Learning:</b><br>Develops rhythm and coordination; <b>Creative Learning:</b><br>Enhances musical understanding                            |
| <b>Puzzle game</b>            | Without subgenre | Docile learning curves; suitable for casual gamers; popularized by smartphones                   | Tetris (2D); Candy Crush Saga (2D)                      | <b>Logical Learning:</b><br>Promotes problem-solving and spatial reasoning; <b>Fun Learning:</b><br>Provides engaging and casual learning experiences    |
| <b>Less widespread genres</b> | Edugame          | Promote fun and learning simultaneously                                                          | Dr. Kawashima's Brain Training for Nintendo Switch (2D) | <b>Cognitive Learning</b><br>Encourages resource management and planning                                                                                 |

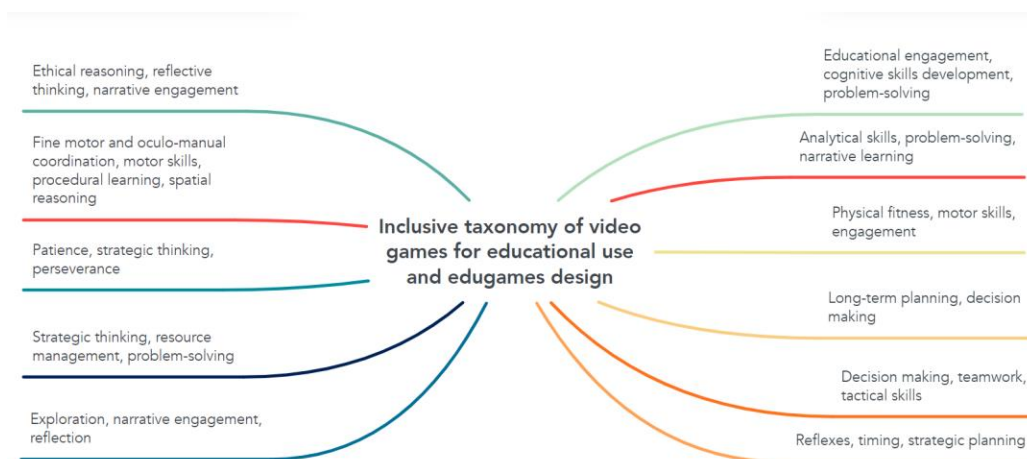
## 5. Inclusive taxonomy of video games for educational use and edugames design

The rapid proliferation of video games since the early 2000s has prompted the market to diversify the usability of gaming products, resulting in a dichotomy between those designed for expert players (soulslike games) and those intended for beginners or less experienced players (Nielsen, 1994; Norman, 2008). In educational contexts, this market logic should be inverted to favor more accessible versions that enable all users to benefit from gaming, regardless of their prior experience. The intersection of education and gaming positions video games as “educational mediators,” capable of facilitating significant learning experiences and skill development, including problem-solving and decision-making (Gee, 2008; Hell & Melzer, 2021).

Moreover, video games have been shown to enhance engagement and attentional skills, potentially addressing attentional challenges among students (Ashinoff & Abu-Akel, 2021). Recognizing this potential, the following taxonomy seeks to establish an inclusive framework for classifying video games, integrating both their educational value and their capacity to cater to diverse user needs.

This inclusive taxonomy, which is the main aim of this work, is designed to classify video games in a manner that supports educational objectives and promotes accessibility. It aims to create virtual spaces that value diversity and facilitate learning across various domains—interpersonal, cognitive, visual-spatial, linguistic, value-based, and reflective. By incorporating categories relevant to special pedagogy and adhering to clear educational criteria, this taxonomy serves as a guide for developing inclusive gaming cultures, communities, and values. The taxonomy categorizes video games by primary genres, subgenres, and their peculiar characteristics, aligned with learning types and methodologies. It incorporates the PEGI rating system to ensure appropriateness for different age groups and to promote responsible use in educational settings.

**Figure 1.** A possible taxonomy of inclusive video games.



**Table 2.** A possible enhanced inclusive version of subdivision/taxonomy of the genres of the videogame market (Mosna, 2018).

Source: adapted from Mosna (2018).

| Type             | Subgenre          | Key Characteristics                                  | Learning Types and Methodologies                            |
|------------------|-------------------|------------------------------------------------------|-------------------------------------------------------------|
| <b>Action</b>    | Platform          | Eye-hand coordination; obstacles; levels; score; map | Motor skills, procedural learning, spatial reasoning        |
|                  | Fighting          | AI-controlled enemies; martial arts; frenetic pace   | Reflexes, timing, strategic planning                        |
|                  | Shooter           | Firearms; egocentric view; online multiplayer        | Decision making, teamwork, tactical skills                  |
|                  | Stealth           | Silent approach; mimicry; consequences for noise     | Strategic thinking, problem-solving, patience               |
|                  | Survival          | Open world; crafting; exploration                    | Resource management, creative thinking, exploration skills  |
| <b>Adventure</b> | Textual Adventure | Puzzle solving; narrative-driven                     | Critical thinking, literacy skills, narrative comprehension |
|                  | Graphic Adventure | Hotspot system; dialogue analysis                    | Analytical skills, problem-solving, narrative learning      |
|                  | Walking Simulator | Exploration-focused; minimal interaction             | Exploration, narrative engagement, reflection               |
|                  | Puzzle Adventure  | Puzzle-centric                                       | Problem-solving, critical thinking,                         |

|                             |                     |                                                       |                                                                       |
|-----------------------------|---------------------|-------------------------------------------------------|-----------------------------------------------------------------------|
|                             |                     |                                                       | pattern<br>recognition                                                |
|                             | Visual Novel        | Story-based choices;<br>manga style                   | Narrative<br>learning, decision<br>making, literacy<br>skills         |
|                             | Interactive<br>Film | Live action;<br>quick-time events                     | Reflexes,<br>decision making,<br>narrative<br>engagement              |
| <b>Action<br/>Adventure</b> | Survival<br>Horror  | Hand-eye<br>coordination;<br>suspense; jump<br>scares | Reflexes,<br>decision making,<br>emotional<br>resilience              |
|                             | Metroidvania        | Labyrinthine map;<br>exploration                      | Spatial reasoning,<br>exploration,<br>critical thinking               |
| <b>Sport</b>                | Simulative          | Follows real sports<br>rules; realistic               | Motor skills,<br>strategic thinking,<br>teamwork                      |
|                             | Arcade              | Simplified rules;<br>fast-paced                       | Reflexes, motor<br>skills,<br>engagement                              |
| <b>RPG</b>                  | Action RPG          | Real-time; fantasy<br>setting; quests                 | Strategic<br>planning,<br>problem-solving,<br>narrative<br>engagement |
|                             | JRPG                | Exploration and<br>combat; Japanese<br>style          | Narrative<br>learning, strategic<br>planning, reflexes                |
|                             | Tactical RPG        | Turn-based combat;<br>character<br>management         | Strategic<br>thinking, decision<br>making,<br>problem-solving         |
|                             | Roguelike           | Randomized maps;<br>high difficulty                   | Critical thinking,<br>adaptability,                                   |

|                   |                     |                                              |                                                          |
|-------------------|---------------------|----------------------------------------------|----------------------------------------------------------|
|                   |                     |                                              | decision making                                          |
|                   | Soulslike           | High difficulty in combat; complex mechanics | Patience, strategic thinking, perseverance               |
| <b>Strategy</b>   | Turn-based Strategy | Turn-based actions; strategic planning       | Long-term planning, decision making, resource management |
|                   | RTS                 | Real-time strategy; competitive              | Tactical thinking, resource management, reflexes         |
|                   | Tower Defense       | Resource management; defensive strategy      | Strategic thinking, resource management, problem-solving |
|                   | MOBA                | Team-based; symmetrical maps                 | Teamwork, strategic planning, tactical skills            |
| <b>Racing</b>     | Without Subgenre    | Kart racing; fast-paced; entry-level         | Reflexes, motor skills, spatial reasoning                |
| <b>Simulation</b> | Management          | Ecosystem building; strategic planning       | Strategic planning, resource management, decision making |
|                   | Life Simulator      | Social and biological activity simulation    | Social skills, resource management, decision making      |
|                   | Flight Simulator    | Simulates real-world flying experience       | Spatial reasoning, strategic planning, reflexes          |

|                               |                              |                                                       |                                                                       |
|-------------------------------|------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------|
|                               | Job Simulator                | Simulates various job activities; training            | Procedural learning, strategic planning, task management              |
|                               | God Simulator                | Management of a people; mythological deity simulation | Strategic planning, ethical decision making, creative thinking        |
| <b>Rhythmic</b>               | Without Subgenre             | Actions in time with music; rhythmic ability          | Motor skills, timing, reflexes                                        |
| <b>Puzzle</b>                 | Without Subgenre             | Simple mechanics; casual play; suitable for all ages  | Problem-solving, pattern recognition, engagement                      |
| <b>Less Widespread Genres</b> | Edugame (Di Tore, 2016)      | Promotes fun and learning                             | Educational engagement, cognitive skills development, problem-solving |
|                               | Serious Game (Di Tore, 2016) | Artistic or conceptual purposes                       | Ethical reasoning, reflective thinking, narrative engagement          |
|                               | Exergames (Di Tore, 2016)    | Physical training                                     | Physical fitness, motor skills, engagement                            |
|                               | Maze                         | Labyrinthine map; Puzzle solving                      | Spatial reasoning, problem-solving, critical thinking                 |

## 6. Conclusions

The exploration of video games within educational contexts has illuminated their potential as powerful tools for learning and engagement across diverse populations. As we reflect on the discussions and findings presented in these pages, several critical

avenues for future research and development emerge. Firstly, there is a pressing need for continued taxonomy refinement that integrates inclusive principles. The proposed taxonomy represents a foundational step towards categorizing video games based not only on gameplay mechanics and narrative elements but also on their educational efficacy and accessibility. This framework should evolve to encompass emerging genres and subgenres, ensuring it remains relevant amidst the rapid evolution of gaming technologies and practices. Secondly, the ethical and pedagogical responsibilities inherent in video game design require ongoing scrutiny and debate. As video games increasingly infiltrate educational settings, stakeholders must collaborate to establish guidelines that promote responsible usage and maximize learning outcomes. This entails fostering partnerships between educators, game developers, and policymakers to navigate complex issues such as content appropriateness, engagement strategies, and equitable access. Thirdly, the integration of video games into formal and informal educational environments necessitates robust empirical research. Future studies should focus on evaluating the long-term impact of gaming on cognitive development, social skills, and academic performance. By employing rigorous methodologies and longitudinal studies, researchers can provide evidence-based insights that inform educational practices and policy-making. Lastly, there exists a compelling opportunity to leverage virtual reality (VR) and augmented reality (AR) technologies within educational gaming contexts. These immersive environments hold promise for creating enriched learning experiences that transcend traditional boundaries, offering students dynamic environments for exploration and discovery. In conclusion, while the journey towards fully realizing the educational potential of video games is ongoing, the contributions from this work underscore their transformative impact on learning paradigms. By embracing innovation, inclusivity, and evidence-based practices, we can harness the power of video games to cultivate engaged learners and prepare them for the challenges of tomorrow's digital landscape

## References

- Aiello, P. (2024). Formazione e professionalità docente tra inclusione e agentività. In P. Aiello & C. Giaconi (a cura di), *L'agire inclusivo. Interfacce pedagogiche e didattiche. Manuale per l'insegnante* (pp. 257-264). Brescia: Scholè.
- Aiello, P., Di Gennaro, D. C., Palumbo, C., Zollo, I., & Sibilio, M. (2014). Inclusion and Universal Design for Learning in Italian Schools. *International Journal of Digital Literacy and Digital Competence (IJDLC)*, 5(2), 59-68.
- Angela, P. (2003). *Da zero a tre anni. Come nasce la mente*. Milano: Mondadori.
- Ashinoff B. K., & Abu-Akel A. (2021). Hyperfocus: The forgotten frontier of attention. *Psychological Research*, 85(1), 1-19.
- Barr, M. (2018). Student attitudes to games-based skills development: Learning from video games in higher education. *Computers in human behavior*, 80, 283-294.

- Bediou B., Adams D. M., Mayer R. E., Tipton E., Green C. S., & Bavelier D. (2018). Meta-analysis of action video game impact on perceptual, attentional, and cognitive skills. *Psychological bulletin*, 144(1), 77.
- Callois R. (Ed. 2017). *I giochi e gli uomini*. Milano: Bompiani.
- CAST. (2018). *Universal Design for Learning Guidelines version 2.2*. Retrieved from <http://udlguidelines.cast.org>
- Ciziceno, M. (2023). Dal game-based learning ai serious games: alcune prospettive per l'apprendimento mediato dalla tecnologia digitale. *Media Education*, 14(1), 73-82.
- Carbone, M. B., Fassone, R. (2020). *Il videogioco in Italia: storie, rappresentazioni, contesti*. Sesto San Giovanni: Mimesis.
- Di Tore S. (2016). *La tecnologia della parola*. Milano: FrancoAngeli.
- Di Tore S., Aiello P., Sibilio M., & Berthoz A. (2020). Simplex didactics: promoting transversal learning through the training of Perspective Taking. *Journal of E-Learning and Knowledge Society*, 16(3), 34-49.
- Di Tore S., Todino M. D., & Campitiello L. (2020). Design and development of a didactical edugame to foster Spatial Thinking. *Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva*, 4(4).
- Ferguson, C. J. (2010). "Blazing angels or resident evil? Can violent video games be a force for good?". *Review of General Psychology*, 14(2), 68-81.
- Frøland, T. H., Heldal, I., Ersvær, E., & Sjøholt, G. (2020). State-of-the-art and future directions for using augmented reality head mounted displays for first aid live training. In *2020 International Conference on e-Health and Bioengineering (EHB)* (pp. 1-6). IEEE.
- Gee, J. P. (2006). Why game studies now? Video games: A new art form. *Games and culture*, 1(1), 58-61.
- Gee J. P. (2008). Video games and embodiment. *Games and culture*, 3(3-4), 253-263.
- Gee J. P. (2013). *Come un videogioco*. Milano: Raffaele Cortina.
- Hookham, G., & Nesbitt, K. (2019). A systematic review of the definition and measurement of engagement in serious games. In *Proceedings of the australasian computer science week multiconference* (pp. 1-10).
- Holl E., & Melzer A. (2021). Kill or Spare—Moral Decision-Making in Video Games. In *International Conference on Entertainment Computing* (pp. 88-99). Springer, Cham.
- Järvinen, A. (2008). *Games without frontiers: Theories and methods for game studies and design*. Tampere University Press.
- Malinconico, R., A. (2021). Portatori di sconfitte Roberto Annibale Malinconico TEDxMarcianise hd, Canale YouTube Impronte Sociali  
[https://www.youtube.com/watch?v=VQw9stQ3898&ab\\_channel=ImpronteSociali](https://www.youtube.com/watch?v=VQw9stQ3898&ab_channel=ImpronteSociali)
- Malinconico, R., A. (2023). *DARE: istruzioni per l'uso*. Edizioni Melagrana, San Felice a Cancellò.
- Mäyrä, F. (2008). *An introduction to game studies*. London: Sage.
- Myers D. (1990). A Q-study of game player aesthetics. *Simulation & Gaming*, 21(4), 375-396.
- Mayer R. E., Parong J., & Bainbridge K. (2019). Young adults learning executive function skills by playing focused video games. *Cognitive Development*, 49, 43-50.
- Mosna L. (2018). *Il videogioco. Storia, forme, linguaggi, generi*. Roma: Dino Audino.
- Mosna, L. (2022). *Origine, origini: cinema e videogiochi*, Lorenzo Mosna, TEDxPisogne  
[https://www.youtube.com/watch?v=UEy4IOyfjSY&ab\\_channel=TEDxTalks](https://www.youtube.com/watch?v=UEy4IOyfjSY&ab_channel=TEDxTalks)

- Nielsen J. (1994). Usability inspection methods. In Conference companion on Human factors in computing systems, pp. 413-414.
- Norman D. A. (2008). Il design del futuro. Apogeo.
- Rivoltella P.C. (2011). Filosofia del videogioco: capovolgendo McLuhan. Vita e Pensiero, 6, 110-115.
- Shaw, A. (2010). What is video game culture? Cultural studies and game studies. Games and culture, 5(4), 403-424.
- Sibilio M. (2014). La didattica semplice. Italia: Liguori.
- Sibilio M. (2016). Vicarianza e didattica. Corpo, cognizione, insegnamento. Brescia: La Scuola.
- Sibilio, M. (2020). L'interazione didattica. Italia: Scholè.
- Szycik G.R., Mohammadi B., Münte T.F. & te Wildt B.T. (2017). Lack of Evidence That Neural Empathic Responses Are Blunted in Excessive Users of Violent Video Games: An fMRI Study. Frontiers in Psychology, 8: 174.
- Teyssier Y. (2016). Why Games For Learning Are The Training Of The Future. Diakses dari <https://elearningindustry.com/5-advantagesgames-for-learning>.
- Todino M., et al. (2022). Towards an inclusive taxonomy of videogame artifacts. Italian Journal of Special Education for Inclusion, X, 2, 246-260 <https://doi.org/10.7346/sipes-02-2022-23>
- Zhao W., & Shute V. J. (2019). Can playing a video game foster computational thinking skills? Computers & Education, 141, 103633