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A Qualitative Analysis of the Educational Value of Commercial Video Games

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Abstract: Video games have evolved from a mere object of consumption to a cultural artifact of our time. Each cultural milieu is connected to the dominant technologies of its time, and video games today present narratives that allow for meaningful dialogues between the younger generations and the themes or content they find interesting. The main objective of this research was to highlight the value of commercial video games with an ideal potential for transmitting pedagogical and curricular content in educational contexts. The scientific methodology used in this study followed a mixed approach divided into three stages (qualitative–qualitative–quantitative). The wide variety of themes and settings found among the 75 top-rated games on the Steam digital distribution platform sheds light on the interests of young people, representing a broad and rich range that highlights their interest in topics that are close and relevant to them. Video games can no longer be ignored, as they represent one of our most widespread cultural values. Their narratives connect directly with the way our young people think, feel, and dialogue. Therefore, embracing video games, both culturally and educationally, is a leap forward with an eye to progress.

Keywords: education; digital competence; video games; cultural industries; educational innovation

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1. Introduction

Over the last five decades, video games have gone from being a mere object of consumption to a cultural practice increasingly controlled by large multimedia corporations. Today, a video game is no longer merely a product aimed at a specific target but a whole multidimensional reality to construct media events. When a video game is released, what is received is a multifaceted product that, in addition to entertainment, generates advertising campaigns, merchandising, debates on social networks, media analysis, gameplays on YouTube, games streaming on Twitch, fan-generated material (artworks, memes, fanfics, cosplay, mods), professional player competitions, academic analyses, and a whole series of cultural practices that increasingly expand the concept of "video game". Consequently, video games evidence a growing text–context relationship, i.e., a significant coherence between what is seen in video games and the socio-political and cultural conditions of its production and reception.

The impact of video games no longer resides only in their economic dimension; they also herald a growing ability to undertake a reflection on themselves and on our world, to be simultaneously a cultural object and a generator of cultures [1]. Moreover, at its heart remains the latent function of transporting users to interactive fictional worlds and containing them in a magic circle that Huizinga [2] separates from the sphere of the real. Today, video games are interpreted as cultural artifacts that can be used by an increasingly wide range of players [3]. In this sense, there seems to be a consensus that video games are neither created nor consumed in a cultural vacuum [4].

For Huizinga [2], play, in its *paidia* aspect, which is opposed to the *ludus* dimension as an unstructured activity lacking complex goals and rules [5], precedes society itself, being

at the germ of culture understood as a network of meanings [6]. In his pioneering work entitled *Deep Play: Notes on the Balinese Cockfight*, Geertz reconsidered the idea of play as an activity separate from everyday life. Instead, play is seen by the American anthropologist as a meta-social commentary. Later, Bogost [7] would insist on this idea, pointing out that "instead of standing outside the world in utter isolation, games provide a two-way street through which players [. . .] carry subjectivity in and out of the game space" (p. 135).

This understanding of video games as cultural artifacts is relatively new in academia and is still reluctant to establish itself outside of it. Squire [8] argued that "when most people think of computer and video games, they think of *Pong*, *Pac Man*, graphic-fighting games such as *Mortal Kombat*, or headline-grabbing shooters such as *DOOM*. Today's games are much more complex". This is partly due to the limited view of the video game fan (the so-called "gamer") and, by extension, of the digital gaming practice that has existed for decades. Significant research [9–11] has shed some light on gamer identity as a social construct. In this sense, De Grove et al. argued "Although today's media environment leaves more room to negotiate how being a gamer is constructed, it remains strongly tied to the idea of [. . .] gaming capital. It refers to the knowledge and know-how of players regarding digital games and their paratexts" [12]. Thus, the gamer has traditionally been identified with the consumption of a series of video games (competitive, goal-oriented, demanding of the player's skills), with a high investment of time required (with the aim, precisely, of achieving more excellent skills and being more competitive), and with enough social capital to engage in conversation with other gamers (via discussion forums, chats, specialized events, etcetera). This restricted view of digital gaming seems to be more in crisis today than ever.

1.1. Being a Gamer Today: A Question of Diversity

Over time, the image of the gamer has broadened and fragmented into a plethora of profiles that are much more specific and oriented towards particular consumption practices, which, in turn, integrate other cultural practices. Twenty years ago, it was possible to keep abreast of all the latest developments through a few specialized magazines. However, today, the disparity in distribution channels, media, and targets is such that it is impracticable to follow the current of an industry in perpetual movement. There is no longer any magazine, website, blog, or podcast capable of covering the entire market. In times of cultural hyper-supply, companies must segregate their consumers if they want to survive the sea of trends, fashions, devices, and diverse cultural scenes.

A recent report [13] revealed that Generation Z (10–24-year-olds) spend their free time playing video games more than any other pastime, including TV, movies, and music. With an average of seven hours and twenty minutes a week, video games now mean much more than just entertainment. Eight out of ten young people born between 1997 and 2015 play video games, with mobile being the platform for the majority (77%, compared to 68% who opt for the PC and 58% who choose the console). Of these users, 71% also watch games streamed on platforms such as Twitch, making digital gaming an essential part of the everyday social life and identity formation of a large segment of the younger population [13].

In addition, organizations such as the Institut de Publique Sondage d'Opinion Secteur (IPSOS) echo the key role that women play in the industry's growth and diversification. According to the report, *Women played. Women paid. Women made* [14], 47% of European gamers are already women, contributing to half of the EUR 3.2 billion year-on-year growth by 2020. Furthermore, according to another dossier on the state of the European industry in 2020, the average age of European female gamers is 32, a profile that breaks with the stereotype of video games as entertainment-focused exclusively on male teenagers [15].

The age range of consumers is also widening in line with the increasing market fragmentation. According to ISFE [15], 60% of the European population in the 25–34 age group play video games regularly, the only age segment that has increased since the previous study in 2019. Moreover, 43% of Europeans aged 35–44 and up to 31% of the

population over 45 also play video games [15], highlighting the demographic breadth of today's gamers. The most significant difference, however, lies in the devices chosen by users: while older gamers prefer consoles and, to a lesser extent, PCs (with average ages between 32.4 and 29.6, respectively), Generation Z turn to mobile devices (tablets and smartphones) as a source of entertainment.

Likewise, according to Statista [16], the age range between 11 and 14 is where the most significant parity between both genders is detected. Along these lines, video games are an important influence among children and adolescents in the choice of STEM (Science, Technology, Engineering, and Mathematics) careers [17,18] so parity at an early age may mean a reduction in the digital gender gap and in the obstacles to accessing scientific careers among women.

1.2. Overcoming Gamification and Serious Games

The information detailed so far shows, on the one hand, the role of video games as a cultural artifact of our time, as the press, radio, or television once was, and, at the same time, its leading role among entertainment products, abandoning its niche role and becoming one of the main channels that connect with today's younger generations [19]. Under these coordinates, it seems logical to think that education, as a generator and transmitter of present and future cultural values, cannot turn a blind eye to such circumstances. Often criticized as an institution with too much inertia and which tends to lag behind cultural needs and changes, education has a magnificent opportunity to face the challenge posed by the new generations and connect with them. It is therefore urgent to accept video games as products whose stories and narratives interest young people and to use synergies not only to generate more exciting classes avoiding current problems such as student boredom in the classroom or burnout [20] but also to transmit educational content, given that many current commercial games deal with subjects of interest such as history (*Civilization*), biology (*Spore*), physics (*Portal*), or mathematics (*Brain Training by Dr. Kawashima*).

Following this line of thought, the Interactive Software Federation of Europe is carrying out a strategic plan to make commercial video games (i.e., games not strictly developed for educational purposes) visible as an educational tool. On its website, the ISFE highlights the qualities of games such as *Democracy 3*, *Valiant Hearts: The Great War*, *Papers, Please*, or *This War of Mine* to disseminate history, politics, or ethics. The association has also published a manual "intended for teachers interested in using video games in their lessons", offering the necessary information "to understand their educational benefits and learn how to use them as educational and motivational resources" [21]. In advocating for a sensible integration of video games in the classroom, the handbook stresses that they can help develop cognitive, spatial, and motor skills and improve ICT skills [21].

1.3. Educational Uses of Video Games: State of the Art

The ISFE also reminds us that while not all video games are created with pedagogical goals in mind (a field reserved for serious games and other analogous disciplines), most possess "intrinsic learning qualities that can challenge learners' cognitive abilities" [21]. Video games are based on the premise that players need to learn, memorize, collaborate, problem-solve, explore, and gather information about the game world to progress. Playing means learning, and one of the main advantages of digital games is their ability to let players learn in an environment designed around challenges of various kinds. Not surprisingly, one of the most outstanding qualities of video games is their ability to motivate and immerse players by learning by doing. Likewise, ISFE contemplates a series of educational applications beyond conventional video games, such as language learning, raising awareness on various issues (climate change, humanitarian crises, sexual health, safe use of the Internet . . .), or even learning-by-developing, introducing programming languages and game creation engines such as Scratch, Unity, and Godot in the classroom.

The use of video games to develop student learning has been investigated in recent years in the scientific literature. The uses of video games in the educational field range

from promoting moral learning in given situations [22] to language learning [23], covering a wide spectrum of possibilities. The acquisition of different skills through video games is growing in the classroom. However, the use of video games is not limited to learning elements directly related to the game itself, but also to its structure through the analysis of the algorithms used to encode the video game [24]. The versatility of digital environments and the predisposition of video game developers to use them within the educational field have favored the creation of video games with the possibility of adapting the scenarios to educational purposes. This fact has been the case of the experience developed by Chang et al. [25] where through the adaptation of the video game Garry's Mod (Facepunch Studios, Walsall, UK, 2006) they promoted the application of the concepts and theories worked on in mechanical engineering.

However, many experiences have been developed directly through the purpose of the video game itself. Learning spatial skills [26], improving the interpretation of communication [27], resource management, and food policy [28] or learning about elements such as immigration, national security, and political asylum [29] are some of the learning objectives that have been analyzed in the scientific literature focusing on the specific content and gameplay of the video game. Using historical games for learning historical and archaeological concepts is a classic in the educational field [30–32] and for learning mathematical thinking [33–35].

Therefore, videogames, in addition to their motivating nature, are a very useful didactic tool for achieving student learning. The predisposition of teachers and video game developers to be used as part of the teaching methodology means their use is growing exponentially within the educational field. The possibilities of increasingly flexible digital environments, the motivating potential of the game, and the aesthetic appeal and playability of current video games establish them as a powerful tool to acquire students' learning and skills.

1.4. Objectives

Therefore, the main objective of this research is to highlight the value of video games as cultural artifacts with an ideal potential for transmitting pedagogical and curricular content in educational contexts. Each cultural moment is connected to the dominant technologies of its time [36]. Currently, video games present narratives that allow for meaningful dialogues between the younger generations and the subjects or contents that interest them. Ignoring this aspect would be wasting the unique potential of video games in favor of other narratives proving to be obsolete or of little significance to young people. This aspiration, far from being an isolated case, is framed within the work detected by European organizations such as the Interactive Software Federation of Europe, the Council of Europe, and the European Games Developer Federation. These organizations seek the recognition of the educational potential of video games and their integration into classrooms from a critical perspective, independent of the industry's interests and in line with the curricular objectives of European educational programs.

This general objective is further specified in the following specific objectives:

- To analyze the themes of these games to find out what content arouses the most significant interest among players;
- To study the setting used in these games to find out which fictional worlds are most popular with today's players;
- To check the origin of the developer studios to establish a map of the industry that shows the weight of specific regions in the content distributed through video games;
- To verify the most repeated themes and settings in the video games most highly rated by users to establish the topics of interest shared by young players;
- To reinforce the role of video games as a current narrative channel that connects with young people and the didactic potential that this offers.

1.5. Scope and Limitations

This research presents a study of the potential of commercial video games for educational purposes. It is not its primary objective to develop specific tools for translating these games to the classroom, a task that has already been addressed by specific projects (as discussed in the Discussion section). Instead, this article aims to reevaluate the educational potential of commercial video games, available on mass consumption platforms such as Steam, by connecting the analysis of their main themes and settings, as well as the geographical origin of these products, to existing game-based learning initiatives in an educational context.

Whether young gamers approach these games out of interest in the subject or purely motivated by the game mechanics is not certain, but what is certain is that they do so. As a result, spaces are created for dialogue between content and players who are dominated by a feeling of well-being and entertainment, favoring intercommunication.

Due to the nature of this research, its scope is deliberately limited to studying the educational potential of products not designed for pedagogical purposes. With this objective in mind, the aim is to highlight the value of including popular culture products of great importance among the young population in school curricula, as has been highlighted for decades with literature, cinema, and other arts.

Further efforts will expand the present research, offering specific models to transfer these video games to the classroom conveniently.

2. Materials and Methods

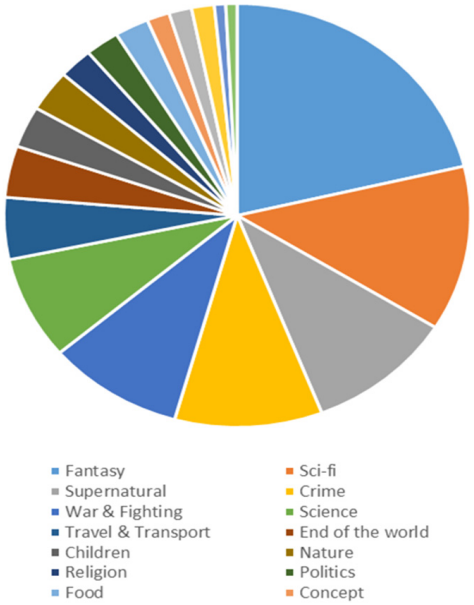
The methodology used in this study followed a mixed approach divided into three stages (qualitative–qualitative–quantitative: qt -> qt -> QT). In the first phase, techniques typical of systematic literature review studies were used to obtain the final sample. This sample is based on the 75 top-rated games by Steam users, available on the Steam 250 public database.

Subsequently, a qualitative analysis of the sample was conducted to identify the variables, dimensions, and categories linked to the video games analyzed, meeting our scientific objectives. For the categorization of the theme and setting variables, and according to Hiseh and Shannon [37], a directed content analysis was applied, using the taxonomy proposed by Lee et al. [38], who define the theme as "the common thread or ideas that recur in the game", and the setting as "the surroundings or environment (spatial or temporal) in which the game takes place" (p. 134). A complete list of themes (Fantasy, Sci-fi, Supernatural, for example) and settings (Urban, Modern, Futuristic, and others) and their definitions were provided by this taxonomy and used for the qualitative analysis, the results of which can be seen in Figures 1 and 2.

Finally, quantitative data analysis techniques (descriptive statistics) were used once the sample was categorized. The qualitative analysis was carried out using Atlas.Ti scientific software, and the quantitative analysis was carried out using SPSS v28 software. Each of these procedures is detailed below.

Theme	%	Theme	%
Fantasy	21.26	Nature	3.15
Sci-fi	12.60	Religion	2.36
Supernatural	10.24	Politics	2.36
Crime	10.24	Food	2.36
War and Fighting	9.45	Concept	1.57
Science	7.87	Sex	1.57
Travel and Transportation	4.72	History	1.57
End of the world	3.94	Business	0.79
Children	3.15	Law	0.79

(Percentage table)

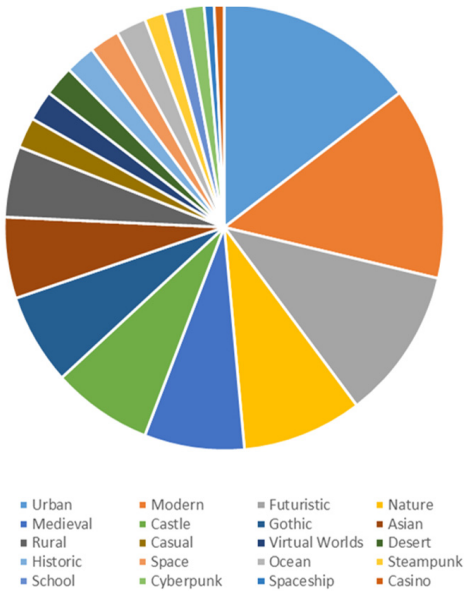


(Graphic distribution)

Figure 1. Themes found in the analysis and percentage of occurrence (source: own elaboration, based on Lee et al. [38]).

Setting	%	Setting	%
Urban	14.71	Virtual worlds	2.21
Modern	13.97	Desert	2.21
Futuristic	11.03	Historic	2.21
Nature	8.82	Space	2.21
Medieval	7.35	Ocean	2.21
Castle	7.35	Steampunk	1.47
Gothic	6.62	School	1.47
Asian	5.88	Cyberpunk	1.47
Rural	5.15	Spaceship	0.74
Casual	2.21	Casino	0.74

(Percentage table)



(Graphic distribution)

Figure 2. Settings found in the analysis and percentage of occurrence (source: own elaboration, based on Lee et al. [38]).

2.1. Extraction of Data

The main objective of this phase was to obtain a video game database with varied and valuable information to meet our scientific objectives, paying particular attention to ensuring that the data collected fully or partially reflected the opinion of the users (players). To this end, we searched different reports and websites representative of the sector to ensure the rigor and validity of the data used. It was finally decided to use the Steam

platform, one of the most giant video game digital distribution platforms [39], using a non-probabilistic purposive sampling approach. The selection criteria were the video game platform with the most significant number of users, to be multiplatform, and to offer, in a transparent manner, a wide variety of metrics on video games based on user feedback. In addition, the information obtained was completed with metrics from Steam 250 (n. d.). This website offers lists of the highest-rated video games by users (gamers) organized in different categories: overall, by date, genre, etcetera.

The final sample consisted of a database of the 75 highest-rated Steam games of all time by Steam users. Once the global database was obtained, for each of the video games presented, information was tracked using the metrics offered by these platforms and completed with other web resources to obtain the most complete, varied, and rigorous information on each game. Of all the data collected for our study, we used the variables "Estimated owners" and "Developer country", which helped us to sort the sample and obtain further information on the geographic background of these video games.

2.2. Categorization of Data

In a second phase, and once we obtained our database, for the categorization of the "Theme" and "Setting" variables, we opted for the taxonomy proposed by Lee et al. [38], who defined the former as "the common thread or ideas that recur in the game", and the latter as "the surroundings or environment (spatial or temporal) in which the game takes place" (p. 134). Based on this classification, we worked with a qualitative approach on the video games in the database to attribute to each entry the corresponding labels extracted from the taxonomy, according to Hiseh and Shannon [37], following the technique of directed content analysis. Hundreds of tags from users and players were analyzed for each game, recategorizing the information obtained based on the proposed framework model. All the information was processed with the software Atlas.Ti. Finally, a final classification of all the games studied and categorized according to the following categories was obtained.

Thus, based on the information collected, we obtained a map of the 75 top-rated games by Steam users and the themes and settings on which these games are based. With this information, we can approximate young people's interests and compare these results with other similar studies.

2.3. Analysis of Data

In the last phase, descriptive statistical techniques were used to facilitate the presentation of the data and to compare the results with the starting hypotheses offered in the introduction. The data analysis was carried out using the SPSS v28 statistical package. The results obtained are presented in the following section.

3. Results

The data extracted from the analysis reflect the situation of a consolidated industry, which attracts millions of gamers and offers a diverse and plural range of entertainment content. A total of 596,740,370 users (Table 1), adding up the figures for the 75 top-rated games on Steam alone, foreshadow the reality of an industry that is growing year on year, which reached USD 180.3 billion in turnover in 2021 and is expected to surpass the USD 218 billion mark by 2024 [39]. Considering that, according to Statista [16], 22% of gamers worldwide are between 10 and 20 years old, we have a population of approximately 131,282,881 gamers within the so-called Generation Z (counting only the 75 most popular titles on the Steam platform). We would have to admit, then, that the video game industry is no longer a sector of the future but of the present.

In terms of the themes that most interest players, understood as the common thread or ideas that recur in the game [38], as can be deduced from the data obtained (Figure 1), young people find a wide variety of themes interesting. As with other means of artistic representation such as cinema, comics, or literature, the themes that most connect with young people continue to be Fantasy (21.2%), Sci-fi (12.6%), and games related to Supernatural

and Crime narratives (10.4% respectively), which tie in perfectly with traditional genres such as horror, thriller, and noir.

Table 1. List of top-rated Steam games by users, sorted by Score and Estimated owners (source: own elaboration, based on the Steam 250 database).

Game	Score	Estimated Owners	Game	Score	Estimated Owners
Portal 2	8.82	17,000,400	Celeste	8.61	1,992,796
Terraria	8.82	51,711,680	Tomb Raider	8.6	9,719,440
The Witcher 3: Wild Hunt	8.8	40,751,920	South Park: The Stick of Truth	8.6	2,892,720
Stardew Valley	8.78	26,697,680	BattleBlock Theater	8.6	3,778,560
Hades	8.78	7,722,364	Deep Rock Galactic	8.6	4,113,512
Factorio	8.77	8,308,080	Satisfactory	8.6	2,461,280
Euro Truck Simulator 2	8.76	28,542,080	Dead Cells	8.6	4,863,540
Left 4 Dead 2	8.75	30,714,400	Mirror	8.6	4,382,664
People Playground	8.73	3,240,328	Don't Starve	8.59	6,069,360
RimWorld	8.73	7,671,200	Fallout: New Vegas	8.59	8,883,440
Portal	8.72	6,262,000	Sid Meier's Civilization V	8.59	8,774,640
The Binding of Isaac: Rebirth	8.71	12,033,680	Subnautica	8.59	12,930,800
Phasmophobia	8.71	10,940,320	Life is Strange-Episode 1	8.58	8,777,200
Garry's Mod	8.71	50,653,840	Persona 4 Golden	8.58	1,768,200
Half-Life: Alyx	8.7	2,111,440	OneShot	8.58	1,643,680
Counter-Strike	8.7	8,846,080	BeamNG.drive	8.57	6,706,240
Helltaker	8.69	9,980,600	Firework	8.57	732,120
Mount & Blade: Warband	8.69	8,277,360	A Short Hike	8.57	369,096
Slay the Spire	8.68	5,525,586	American Truck Simulator	8.57	5,797,120
Half-Life 2	8.66	7,787,440	Valheim	8.57	9,594,520
Totally Accurate Battle Simulator	8.66	3,471,468	Counter-Strike: Source	8.57	6612240
Hollow Knight	8.66	10,369,392	The Walking Dead	8.56	2,623,040
Bloons TD 6	8.66	5,882,188	VA-11 Hall-A: Cyberpunk Bartender Action	8.56	1,837,120
Slime Rancher	8.65	5,321,360	The Wolf Among Us	8.56	1,721,440
Katana ZERO	8.64	1,869,920	Divinity: Original Sin 2-Definitive Edition	8.56	9,137,120
The Henry Stickmin Collection	8.64	988,800	Broforce	8.56	2,928,320
Resident Evil 2	8.64	3,270,696	Senren * Banka	8.55	263,840
Doki Doki Literature Club!	8.63	16,745,900	Half-Life	8.55	4,163,040
ULTRAKILL	8.63	546,880	Cuphead	8.55	4,644,684
OMORI	8.62	935,320	Papers, Please	8.55	3,348,240
A Hat in Time	8.62	2,024,946	One Finger Death Punch	8.55	968,000
Don't Starve Together	8.62	14,953,360	Ori and the Will of the Wisps	8.54	2,691,520
Dyson Sphere Program	8.62	1,811,760	Oxygen Not Included	8.54	4,572,678
Undertale	8.61	11,513,360	Rhythm Doctor	8.54	443,880
Hotline Miami	8.61	4,430,960	There Is No Game: Wrong Dimension	8.54	480,280
Dishonored	8.61	3,762,960	Castle Crashers	8.54	4,970,320
Risk of Rain 2	8.61	5,778,292	Baba Is You	8.54	627,640

However, beyond these expected data, the variety of themes that young gamers approach is noteworthy. Far from appearing to be a dull and uninterested generation, as they are often described [40], among the 75 highest-rated games, we found topics such

as Travel and Transportation, End of the world, Nature, Religion, Politics, History, and Law, among others. This fact may suggest that current generations are still interested and concerned about those aspects of their lives that are relevant and meaningful to them and that, probably, if they are disinterested in schools, it is because we have not found the appropriate narratives that make the dialogue concrete and facilitate discourses specific to their generation.

As mentioned in the previous section, a complete list of the most common themes and settings in video games was provided by Lee et al. [38] and used for the qualitative analysis. The resulting analysis yielded valuable results about the themes most used by popular video games, such as Fantasy (21.26% of the sample), which appears in titles such as *Terraria*, *The Witcher 3: Wild Hunt*, *Stardew Valley*, *Hades*, or *Mount & Blade: Warband*, to name a few. This taxonomy has proved very useful, as it allows, for example, to link the same game to more than one theme, as in the case of *Resident Evil 2*, which was categorized as "End of the world", "Science", and "Supernatural". Figure 1 shows all the themes that appeared in the qualitative analysis, although the cited taxonomy contemplates more categories that were not detected, such as "Holiday", "Medicine", or "Art & Design". These were excluded from the results.

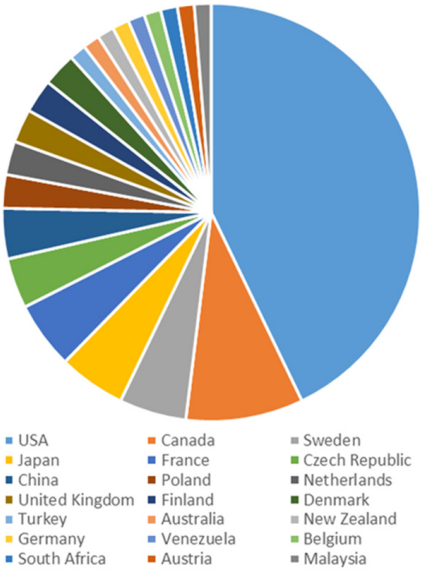
As seen in Figure 2, the settings of all these games represent a vast and rich range of contexts that highlight the interest of young gamers. Once again, the often-reported lack of engagement in schools [40] may be more related to the imposition of discourses or narratives of previous generations than to cynicism or apathy. Therefore, using video games as a tool capable of generating narratives that connect with young people and allow for dialogue, and bring the new generations closer to social and pedagogical focuses of interest is no longer a recommendation as in the past decade, but almost like an imperative, just as video or cinema have been traditionally used as didactic tools.

The same process described in the thematic analysis was followed for the "Setting" category. Thus, we found very popular surroundings such as Urban (14.71% of the sample), present in games as varied as *Euro Truck Simulator 2*, *Half-Life 2*, *Katana ZERO*, or *A Hat in Time*. Again, the same video game could include more than one setting, as in the case of *Resident Evil 2*, which takes place in urban and modern spaces. As with the previous list, the original taxonomy provided settings not found in the analysis, such as "Game show", "Hospital", or "Renaissance", which were therefore excluded from the results.

In terms of the origin of games, we found that more than half (51.95%) were developed in North America or by multinationals headquartered in this region (the United States and Canada), as shown in Figure 3.

On the one hand, this figure is consistent with the provenance of the Steam platform, owned by the US company Valve. While Steam has established itself as one of the preferred digital distribution networks for gamers worldwide [39], it should not be forgotten that it is a service linked to North American culture and mainly focused on Western users. It is, therefore, logical to see a low number of games developed by Asian companies and those from other geographical regions, which often have dedicated channels geared to the tastes and trends of their audiences (such as QQ Games and WeGame in China or the Nintendo eShop in Japan). Even so, it is worth paying attention to the weight that certain powers in the video game industry can achieve and especially to what position this scenario leaves the European industry, which currently lacks its distribution means, depending entirely on foreign resources. In this sense, the European presence on Steam barely reaches 31% of production (Figure 3), reflecting the essential consumer role of this market.

Country	%	Country	%
USA	42.86	Denmark	2.60
Canada	9.09	Turkey	1.30
Sweden	5.19	Australia	1.30
Japan	5.19	New Zealand	1.30
France	5.19	Germany	1.30
Czech Republic	3.90	Venezuela	1.30
China	3.90	Belgium	1.30
Poland	2.60	South Africa	1.30
Netherlands	2.60	Austria	1.30
United Kingdom	2.60	Malaysia	1.30
Finland	2.60		



(Percentage table) (Graphic distribution)

Figure 3. Developer countries found in the analysis and percentage of occurrence (source: own elaboration).

4. Discussion

The sample analyzed allowed us to see how the most popular video games for conventional players corresponded in many cases to successful cases and educational projects linked to the use of these and other games for educational purposes.

In a study by Shute et al. [26], participants completed a series of tests related to problem-solving, spatial skills, and perseverance before and after playing *Portal 2* (Valve, Bellevue, WA, USA, 2011). The results showed that participants significantly improved their skills after playing this physics-related puzzle game (Table 2). Another study by Carlzon [27] brought the video game *Fallout: New Vegas* (Obsidian Entertainment, Santa Ana, CA, USA, 2010) into the classroom to test its potential for improving students' pragmatic understanding, using the game's dialogue choice system with non-player characters, which forces the player to interpret the communicative intent of their interlocutors. Even seemingly futile games such as *Cookie Clicker* (Julien Thiennot, 2013) have proven helpful in testing gamification and questioning the intricacies of progression in playful environments [41].

Table 2. Relationship between videogames, theme, settings, learning, and their references (source: own elaboration).

Game	Theme	Settings	Learnings/Competences	References
Portal 2	Science/Sci-fi	Futuristic	Problem solving, spatial skills	[23,26]
Fallout: New Vegas	Sci-fi/End of the World	Casino/Desert/ Urban/Futuristic	Pragmatic understanding	[27]
Don't Starve	Science/Food/Supernatural	Nature/Gothic	Food values, politics of food	[28]
Papers, Please	Politics/History/Laws	Urban/Historic	Security, immigration, political asylum, moral learning	[22,29]
Life is Strange-Episode 1	End of the World/Supernatural/Crime	School/Urban/Modern	Gender identity values	[42]
Sid Meier's Civilization V	Science/Travel and Transport/Religion/War and Fighting/Politics/History	Castle/Desert/Nature/ Ocean/Urban/Historic	History	[30,31]

Table 2. *Cont.*

Game	Theme	Settings	Learnings/Competences	References
RimWorld	Sci-fi	Futuristic	Critical thinking	[24]
Garry's Mod	Sci-fi/Crime/Fantasy	Casual	Implementation of concepts and theories of mechanical engineering	[25]
Divinity: Original Sin 2-Definitive Edition	Fantasy/War and Fighting	Medieval	Mathematical thinking	[35]
Cookie Clicker	Food	Casual	Progression in playful environments	[41]
Monument Valley	Sci-fi/Fantasy	Futuristic/Medieval/Castle	Mathematics and art	[33]
Age of Empires II: The Age of Kings	War and Fighting/History	Medieval/Castle/Historic	Social Sciences and mathematics	[34]
Minecraft	Sci-fi/Supernatural/	Medieval/Virtual Worlds	Social Behavior	[43]
Animal Crossing: New Horizons	Fantasy/Business	Nature/Rural/Virtual Worlds	Concepts related to the Market	[44]
Assassin's Creed: Origins	Fantasy/Religion/History	Historic	Archaeological knowledge of ancient Egypt	[32]

Regarding the survival and resource management game *Don't Starve* (Klei Entertainment, Vancouver, BC, Canada, 2013), this has proven helpful in assimilating food values "in ways that can inform our understanding of the politics of food systems in everyday life" [28]. In a similar vein, Carolan [29] proposed the video game *Papers, Please* (Lucas Pope, 2013) as a tool for assimilating content on security, immigration, and political asylum, whereas *Life Is Strange* has emerged as a tool for transmitting gender identity values [42]. Many studies have also recorded the educational benefits of historical games such as *Civilization V* (Firaxis Games, Baltimore, MD, USA, 2010) [30,31] since the inception of this popular series in 1991. Following Squire's findings on video games and education, pedagogically, *Civilization* "offers an interesting reframing of history from one organized around 'grand narratives' to one marked by themes and patterns, a method of teaching world history advocated by an increasing number of educators" [8].

The use of commercial video games for educational purposes extends to other titles beyond the sample collected for this research. In Čujdíková's [33] study, the video game *Monument Valley* (ustwo Games, London, UK, 2014) was used as a multidisciplinary tool for learning mathematics and art. The video game enhanced the learning of unconventional thinking, through which the skills of generating innovative ideas and spatial imagination are developed. The connection between mathematics and art resulted in the higher motivation of the students, as they learned that the former is a valuable tool for constructing artistic elements.

Gros and Garrido [34] used *Age of Empires II: The Age of Kings* (Ensemble Studios Corporation, Dallas, TX, USA, 1999) with secondary school students to learn social sciences and mathematics. The experience was carried out by playing in pairs, promoting peer learning through which they had to connect what they experienced in the game and the curricular content. Another of the results of this research was the importance of teachers being experts in those video games used in education in order to be able to take advantage of their full potential.

In the field of competition as a strategy for improving learning, the research carried out by Nebel, Schneider, and Rey [43] introduced the use of *Minecraft* (Mojang Specifications, Stockholm, Sweden, 2010) in their teaching in a practical way under different game configurations (single, one-versus-one, small group, and classroom). The goal was to test whether social competition between students improved cognitive load, commitment, and interest in the subject and, consequently, improved learning. The study results were mixed depending on the game's configuration, the most interesting being the increase in learning when play-

ing alone compared to competition between students. At the same time, when competition between students was established, situational interest and engagement increased.

Other experiences have focused on the exclusive learning of the contents of the subject, such as the study carried out by Mateer and O'Roark [44] in which *Animal Crossing: New Horizons* (Nintendo, Kyoto, Japan, 2020) was used as a learning tool for students to acquire the different concepts related to the market.

MacLeod [32] introduced the use of *Assassin's Creed: Origins* (Ubisoft Divertissements Inc., Montreal, QC, Canada, 2018) in her teaching in archaeology through the Discovery Tour feature. This game mode represents an approach of some developers to use video games in the educational field, as it removes the violent battles included in the original game to leave the aesthetics alone. In this way, students and teachers can focus on the game's visual elements, taking advantage of these resources to place the knowledge worked on theoretically in a virtual space where they become first-person protagonists. This feature of *Assassin's Creed: Origins* was a fundamental element in MacLeod's research [32], as it allowed students to be introduced to an experiential experience in which they walk through ancient Egypt without the distractions of battles, achieving an immersion that is wholly focused on the content of the subject: archaeological knowledge of ancient Egypt. The research showed that, through this immersion, students acquired better skills to interpret archaeological reconstructions through critically discussing what is represented in-game and conceptualized theoretically. The students showed that using *Assassin's Creed: Origins* improved their engagement with the subject, as what they learned connected with their interests. They also highlighted the importance of the immersive experience, as beyond purely conceptual learning, it allowed them to place their knowledge in a visual and sensory environment, in which the knowledge acquired great significance throughout the subject.

However, as already advanced in the results (Figure 3), the context of the production of video games also plays a role in the political and ideological nature of the underlying discourses they promoted. Since creation does not take place in an ideological vacuum [4], the interconnections between culture and communication, as well as how texts reflect the conflicts and political discourses in which they are produced, urges educators to examine the conditions under which video games are perceived and interpreted by players, especially younger ones. Adorno and Horkheimer [45] stated that the culture industry plays a central role in linking its target audience to the status quo and turns the culture itself into the ideological media of sovereignty.

It has been noted that games such as *Counter-Strike* (Valve, 2003) and *Counter-Strike: Source* (Valve, 2004), two of the best-selling titles on the Steam platform, generate a "commodity fetishism" in players, who often describe their experience of purchasing in-game items in terms of psychological boost, self-confidence, and feeling better, causing a sort of "placebo effect" [46]. Historical games such as the aforementioned *Civilization V* also require close reading that places the game mechanics and the emerging narrative in their proper ideological context. As Henthorne [47] has pointed out, "Like traditional literary utopias, these cyber-utopias develop alternative realities that, in addition to providing entertainment, offer social commentary [. . .] Rather than simply provide an escape, cyber-utopias induce players to rethink the nature of their social lives as they play out alternative social realities".

As seen in the table, all the cases appearing in the discussion can fit perfectly into one of the categories proposed by Lee et al. [38] and shown in Figures 1 and 2, reinforcing the results presented. Moreover, when video games are used in education, it is interesting to see how the learning derived from them is not always directly linked to their narrative and can be related to other aspects of the video games, such as their mechanics or the skills required to perform the proposed puzzles, for instance. This fact reveals a huge potential when considering the introduction of commercial video games for educational use, as it amplifies and multiplies the possibilities. In this study, our objective focused on highlighting the ability of the narrative to engage and attract young people, which can be expanded and continued by delving into other complementary factors such as whether the

use of specific mechanics has the same capacity for attraction, for example. In any case, and in the absence of delving deeper into these aspects, it might be easy to imagine that certain types of games, mechanics, or genres are more susceptible to the effect of fads, while the themes proposed by Lee et al. [38] and revealed in the study might have more sustainability over time.

5. Conclusions

Although the use of video games within the educational environment is relatively incipient, we can confirm its use is increasing within teaching methodologies. The visual and playful appeal of video games has become an essential element to engage students in learning processes while simultaneously being a powerful tool for teaching different subjects. Video games allow the application of theoretical elements within virtual environments that are very close to reality, which is usually a difficulty in the learning processes of highly technical training. They also offer the possibility of immersion within historical scenarios, facilitating the introduction of students to an environment closer to the reality studied and favoring the learning of historical and archaeological elements from a perspective closer to reality than a purely theoretical one. In addition, video games have been shown to have the ability to place students in situations to develop their spatial skills, become aware of food policies, analyze the values of gender identity, promote critical thinking in students or reflect on the social representation through the codes of video games. In other words, the variety and possibilities of educational actions that favor video games as a tool are wide in student learning. The playful part of video games is significant, but they are no longer limited. The educational field, increasingly connected with video game developers, is opening a new door that illuminates excellent results in learning and developing skills.

In addition, it is interesting to highlight the remarkable capacity of video games to transmit knowledge. As already mentioned in this article, the video game is a cultural artifact with a great narrative capacity. It promotes immersion and offers endless possibilities that allow educators to choose those video games whose narrative adapts to the contents they wish to transmit. Nevertheless, the video game does not stop there; unlike other narrative formats, it allows players to interact through the mechanics, puzzles, or problems it poses. This fact is exciting from an educational point of view since it amplifies the didactic capacity of the video game, allowing it to work on content through its narrative, mechanics, puzzles, or a combination of all. In addition, interaction increases immersion and, therefore, the ability to connect with young audiences accustomed to interactive narratives and the digital world.

As we have seen, young people spend many hours immersed in the stories and fictional worlds of video games, some of which are highly topical and have significant social and pedagogical potential. Therefore, regardless of whether they approach them out of interest in the subject or purely motivated by the game mechanics, what is certain is that they do so and that, as a result, spaces are created for dialogue between the content and the players, who are also dominated by a feeling of well-being and entertainment, favoring intercommunication. Education, as a service for the present and future society, has the opportunity to accept the challenge of taking advantage of the ability of video games to connect with narratives and establish meaningful dialogues that generate learning spaces for young people. Accepting this means overcoming the eternal prejudice of thinking that young people only seek video games for recreational purposes and are not motivated by other cultural interests. In short, it would be to pose half-truths, such as assuming that the practice of recreational sports such as tennis or team sports, because they are fun, are not beneficial for the people who practice them or improve physical capacity.

These facts should alert us, both to take advantage of the potential of video games to create culture and opinion and to be cautious, moderate, and, above all, critical in our choice of appropriate titles. As cultural commodities, video games have considerable potential as tools of ideological influence. They are products that embody the ideology of their context and can therefore be used to address socio-cultural issues beyond conventional

pedagogical uses. This idea reminds us of the need to bring video games into the classroom in a critical way. As products of their time, they can transfer a series of values linked to the context of production. Since, as we have observed, a high percentage of the most popular games are developed by companies from similar national–cultural contexts, it is not surprising that, as with other mass media (cinema, television, social media), they incorporate a series of specific values. Aspects of contemporary society, such as the highly competitive nature, utilitarianism, pragmatism, the importance of self-image, or the desire for accumulation of goods, are present in a significant part of the most successful titles. Therefore, it is the educator's responsibility to encourage a critical reading of the discourses derived from video games without renouncing the positive aspects of introducing these cultural commodities in the classroom.

Regardless, it seems clear that video games can no longer be ignored, as they represent one of our most widespread cultural values. Their narratives connect directly with the way our young people think, feel, and dialogue. Embracing video games, both socially, culturally, and educationally, is a leap forward with an eye to progress and an understanding that, as happened with cinema, or much earlier with literature, it is more than likely that in a few decades, most of the population living in schools will have played or will play video games regularly. Furthermore, this is a reality that we, as educators, cannot ignore.

Finally, and although it has already been mentioned in the Scope and Limitations section, we consider it necessary to recall that this study aimed to highlight the didactic potential of video games as a narrative, cultural artifact capable of connecting with the interests of young audiences. Although it is considered that the scientific objectives fulfill this purpose, the authors of this work understand it is necessary to continue taking steps in this direction and to go deeper into the rest of the factors that make up a video game. Thus, other factors such as a specific type of mechanics (resource management, exploration, tactics, combat, or others) or a specific genre (platformer, RPG, sandbox, adventure game, for example) can be as relevant in attracting players as the narrative itself, and it is, therefore, necessary to further study these factors, both in isolation and together. That would allow us to broaden our knowledge of young audiences' interests and help us successfully select specific video games according to educational needs.

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