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Players' perceptions of learning, transferability, and future gaming: A Reflexive Thematic Analysis in Portugal ☆

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ABSTRACT

Despite extensive evidence on the effectiveness of games as learning spaces, players' perceptions of learning transferability remain underexplored. Transferability refers to the ability to apply knowledge or skills beyond the context in which they were acquired. How players perceive and narrate this process is relevant to understanding the adoption and potential effectiveness of games for learning. This article reports a study exploring players' perceptions of learning through video games, the transferability of game-related skills, and their views on the future of gaming and online spaces. Framed within a larger multi-method study, the Reflexive Thematic Analysis was based on two open-ended questions answered by a non-probabilistic sample of 627 Portuguese-speaking players ($M = 27.09$; $SD = 11.84 years$). Participants identified several skills and ideas that they perceived as acquired through video games and transferable to other areas of life, in cognitive, social, cultural, emotional, and creative dimensions. They also described a recurring tension between perceived benefits and risks, alternating between educational and economic opportunities, as well as concerns about addiction, isolation, and commercial exploitation. Although situated within the Portuguese context, these findings encourage broader discussion of gaming's role in everyday life and support the need for further qualitative research on perceived transferability.

1. Introduction

Video games are now a central part of global culture, shaping identity, socialisation, learning, and community formation across different ages and social groups [1,2]. They serve as platforms for entertainment, education, and are recognised as tools for stress relief, creativity, and social connection, especially during periods of isolation [3,4]. The medium of games is increasingly used to address social issues, improve digital literacy, and even support political communication [5]. These social and educational applications have positioned gameplay-based skill acquisition and the players' self-perception of learning as central research priorities.

Although previous research has extensively examined learning, skill development, and transfer in relation to games [6–8], less attention has been paid to how players themselves interpret, narrate, and assign meaning to these processes in everyday life [9]. Rather than evaluating whether gameplay produces objectively measurable transfer across contexts, this study adopts a qualitative, perception-based approach to explore how digital players understand the skills they associate with gaming, the extent to which they perceive these skills as transferable, and the meanings they attach to these experiences. The study therefore contributes to understanding transferability as a subjective and socially situated process, as perceived and articulated by players.

In this study, transferability refers to players' perceived ability to apply game-related knowledge or skills beyond the gaming context [10,11]. Although gaming has been increasingly recognised as a powerful context for developing essential 21st Century skills, there is also limited empirical evidence about how learning outcomes from game environments can be effectively transferred to other contexts [12].

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Learning through video gameplay can be understood through situated perspectives, which emphasise that learning and transfer are inseparable from the social and cultural contexts in which they occur [12,13]. In this sense, games are epistemic frames — structured worlds in which cognitive, social, and emotional skills are enacted and tested [14]. Through game mechanics and narrative design, players engage in problem-solving, communication, and adaptability, simulating complex "real-world scenarios" within bounded spaces [15,16]. These bounded fictional epistemic frames support different learning processes, four of which are particularly relevant here. Cognitive learning involves the development of reasoning, problem-solving, and attention control [12], as well as effects on critical thinking and cognitive gains [17]. Social learning includes promotion of cooperation, communication, and leadership in team-based or role-play settings [14,16]. Emotional and metacognitive learning refers to the improvement of resilience, emotional regulation, and self-efficacy, supported by iterative feedback and reflection [16,18]. Finally, linguistic and cultural learning involves the enhancement of digital and media literacies, as in critical and participative dimensions of Media and Information Literacy [19,20]. These four dimensions informed the interpretation of participants' accounts.

Learning transfer is not an automatic process. It requires reflection and guided mediation. Without a structured debriefing, players may fail to recognise or apply what they learned in new contexts [10]. Debriefing is a protective factor for sustained engagement and meaningful learning [21]. This means that, even if games create unique opportunities for experiential learning, pedagogical intentionality is fundamental to the transferability of skills acquired in games; experiencing the learning game is not sufficient by itself. Thus, careful design and instructor guidance are necessary to ensure that educational objectives are met [16].

1.1. Critical perspectives and dichotomies around gaming

Research in the gaming field consistently highlights a tension between its potential benefits and associated risks. Studies have shown that problematic gaming behaviour is frequently linked to anxiety, depression, and disrupted sleep [22]. The World Health Organisation's [23] recognition of gaming disorder as a pattern of gaming behaviour reflects broader institutional concern about this topic. This recognition remains debated. Some (e.g., Király et al. [24]) argue that these diagnoses risk oversimplifying real health issues and pathologising what is, in fact, an eclectic cultural practice.

Extended gameplay has also been associated with physical health concerns, such as sedentary behaviour, particularly among younger populations [25,26]. Moreover, predatory and deceptive tactics used by games companies to maximise profit, such as dark design patterns, have raised ethical concerns. These tactics often explore psychological vulnerabilities, encouraging compulsive spending and reinforcing disengagement from offline contexts [27,28]. Younger players, in particular, are more likely to be affected by these mechanisms due to underdeveloped impulse control, which makes them particularly vulnerable to exploitative design [29].

However, risk-focused narratives may obscure gaming's documented benefits, namely the potential role of this activity to satisfy a broad range of psychological needs [30]. Studies focused on the educational benefits of gaming demonstrate improvements in spatial reasoning, problem-solving, cognitive development, and collaborative skills [31]. At the same time, inclusive game design approaches have shown to enable participation by neurodivergent players, players with disabilities, and other marginalised communities [32], fostering a sense of agency, well-being and acceptance in online spaces that, at times, physical environments deny them [33,34]. Regarding mental health, several types of games have been linked to clinical studies, such as Role-Playing Games. Studies demonstrate their potential as complementary tools or strategies for addressing mental health [35,36]. Among the listed benefits, authors report higher levels of reflection, empathy, and peer learning [37].

Players' perceptions of the future of gaming are also analytically relevant to the present study, not as a separate line of inquiry detached from learning and transferability, but as a way of understanding the broader conditions within which these processes are imagined to unfold. When participants reflect on the future of video games and online spaces, they also reveal the social, technological, and ethical factors they believe may expand, constrain, or reshape the value of gaming in everyday life [38,39], including its perceived potential for learning, skill development, and transferability beyond the game context. In this sense, future-oriented accounts might help contextualise how players make sense of gaming in the present, based on the notions of authors like Sezen and Sezen [40] or Shen et al. [41], linking perceived benefits and opportunities with anticipated risks, limitations, and conditions of possibility.

Sachan et al. [38] underline how players' voices are fundamental to gaming worlds, as intersecting virtual identities influence social interactions and overall social capital. In this sense, gaming exists as a paradoxical digital space where participatory culture enables empowerment while commercialisation, social withdrawal, and dependency prompt genuine risks. Research shows that positive gaming experiences empower marginalised groups through inclusion and self-expression, and can even support social decision-making that supports democratic participation [42]. This suggests that gaming can, therefore, rise as a vital subject for critical digital literacy and participatory digital citizenship research. Jenkins [43] demonstrates how gaming embodies convergence culture's defining features: the merging of old and new media, the rise of participatory culture, and the growth of transmedia storytelling. By doing so, gaming fosters participatory literacies, inviting players to engage in knowledge production, collective problem-solving, and creative expression, through modding, streaming, and online communities. Gee [44] captures this dynamic through his concept of affinity spaces, defined as environments where people connect through shared activities, interests, and goals rather than predetermined categories such as race, class, or gender.

Yet, authors such as Buckingham [45] and Turkle [46] remind us that these empowering possibilities coexist with intensified consumer culture, local isolation, and diminished face-to-face social contact. Given these complexities, Pangrazio [47] argues that this can be countered by critical digital literacy, whereby literacy moves beyond technical or functional competence to question power structures, media ideologies, algorithmic manipulation, and the actual agency users possess within digital platforms. Viewing gaming through a participatory digital citizenship lens adds another dimension: it pushes us to cultivate active, reflective, and ethical engagement in digital communities, converting players into co-creators of their own experiences. Studying gaming through these frameworks can support new knowledge and approaches on how digital play shapes identity formation, civic participation, and socio-cultural dynamics within contemporary media ecologies.

1.2. Research objectives

Against this background, the present study explores both how players perceive learning and transferability through digital play, and how they imagine the wider conditions that may shape these processes in the future. The study is guided by two specific objectives (SOs):

- To explore how players perceive learning through video gameplay and how they understand the transferability of gaming-related skills to everyday life (SO1);
- To explore how participants imagine future developments in gaming and online spaces, particularly in relation to the opportunities, risks, and conditions they perceive as shaping the broader implications of digital play (SO2).

For methodological clarity, the study does not seek to determine whether such transfer occurs in objectively measurable terms. Instead, it examines how players themselves make sense of its possibility, significance, and limits.

2. Methods

2.1. Participants

This study collected data through an online questionnaire distributed by undergraduate students enrolled in a research methods course. The sample was diverse, including participants from different genders, age groups, and educational backgrounds This provided a heterogeneous overview of gaming practices. To be eligible, participants had to be of legal age, regularly play video games in any genre or platform, and have proficiency in Portuguese, since the survey was administered in this language. In total, 627 individuals took part in the study, including 390 cisgender men (62.20%), 222 cisgender females (35.41%), three non-binary individuals (0.48%), two trans females (0.32%), one trans male (0.16%), and 12 participants who preferred not to disclose their gender (1.91%). The mean age of the sample was 27.09 years ($SD = 11.84$).

Regarding education, 28 participants (4.47%) had completed middle school, 419 (66.8%) had finished high school, 141 (22.49%) held a bachelor's degree, 37 (5.90%) held a master's degree, and two (0.32%) had earned a doctorate. Participants also reported varied amounts of time spent on gaming. Specifically, 168 individuals (26.79%) reported playing several times a month, 120 (19.14%) reported playing several times a week, and 96 (15.31%) played almost every day. Daily gaming habits were further differentiated by duration, with 49 participants (7.81%) reporting about one hour per day, 111 (17.71%) playing for about 2–3 h, and 59 (9.41%) spending 4–5 h per day. A smaller proportion reported higher levels of engagement, with 11 participants (1.75%) playing 6–7 h per day and 13 (2.07%) playing for eight or more hours daily.

According to Guetterman [48], qualitative studies have an average sample size of 87, with some reaching up to 700 participants. In this regard, the present sample is unusually large for a qualitative design and offers a broad range of player accounts.

2.2. Questions and data collection

This study formed part of a broader mixed-method survey designed to investigate the relationships among gaming habits, digital–offline balance, motivations, and subjective experiences related to engagement with video games. The full instrument included demographic enquiries (age, gender, education, etc.) and other quantitative questions related to gaming habits and digital media.

From the entire survey, two open-ended questions were considered for the following thematic analysis:

- Describe a skill, knowledge, or idea you have acquired through video games and how this has been reflected in your offline life.
- How do you imagine people's relationship with video games and the digital world will evolve in the coming years? Mention a risk and an opportunity that, in your opinion, may arise.

These questions were designed to encourage self-reflection and the description of self-perceived significant episodes related to the transferability of game-acquired skills, as well as regarding the future of online gaming. Moreover, this approach was preferable to other more in-depth qualitative approaches, as it enabled the collection of a larger and more diverse pool of responses ($N = 627$).

2.3. Data generation, ethics, and methodological positioning

The qualitative data analysed in this study were collected between February and May 2025 through a questionnaire administered in two formats: digitally, via Google Forms, and on paper. This dual-format approach was adopted to maximise accessibility and participation across heterogeneous contexts. Paper responses were subsequently digitised and merged into a single anonymised database, ensuring confidentiality and consistent data handling.

The study adhered to the ethical principles of the Declaration of Helsinki, APA ethical guidelines, and the AoIR Internet Research: Ethical Guidelines 3.0 [49–51]. In accordance with national regulations concerning privacy and informed consent, formal IRB approval was not required. Only fully completed questionnaires with informed consent were included in the dataset.

The study was informed by a socio-critical and interpretative perspective, which understands knowledge as contextual, relational, and co-constructed within broader social and cultural structures [52]. From this standpoint, video games are approached not merely as entertainment artefacts, but as culturally situated and performative practices involved in the production of meanings, identities, and subjectivities [53–55]. Consistent with this orientation, the study employed Reflexive Thematic Analysis (RTA) [56,57] as a flexible and interpretative qualitative method suited to exploring how participants made sense of learning, transferability, and future developments in relation to digital play.

2.4. Analytical procedure

The qualitative material consisted of participants' written responses to the open-ended questions. The unit of analysis was the meaning-bearing segment within each response, while each answer was also considered as a whole to preserve context and avoid fragmenting participants' accounts. In line with Braun and Clarke's [56,57] approach, the analysis was recursive rather than linear, with themes developed through interpretative engagement with patterns of shared meaning across the dataset, rather than through code counting.

The data were first read and re-read to support immersion and familiarisation with the corpus. As responses were produced in Portuguese, coding was conducted in the original language by two researchers to preserve participants' meanings. The initial coders held analytic discussions while the data were still in Portuguese. Only the analytic outputs, namely theme labels and illustrative quotations, were later translated into English, with back-translation, so that all members of the research team, including three non-Portuguese-speaking researchers, could contribute to the interpretation of the findings and the writing of the discussion. Wider team discussions were used to strengthen analytic rigour.

Initial codes were generated inductively and systematically across the dataset, grounded in participants' accounts rather than in a pre-existing coding framework. These codes were then iteratively compared, grouped, and refined into provisional themes and subthemes through repeated movement between coded extracts and the dataset as a whole. This process was conducted by two researchers working in close dialogue, with intermediate and final thematic interpretations discussed with the wider research team.

Themes were then defined and named to capture coherent patterns of shared meaning rather than descriptive topic groupings. Illustrative quotations were selected for their clarity, thematic relevance, and ability to convey both commonality and variation within themes. The final phase involved producing the written account. Throughout the process, reflexivity was treated as integral to the analysis rather than as a bias to be eliminated, in line with its recognised centrality in qualitative inquiry [58]. Disagreements were resolved, following Richards and Hemphill [59], through guided discussion, open critique, and reflection on dissenting viewpoints within the team.

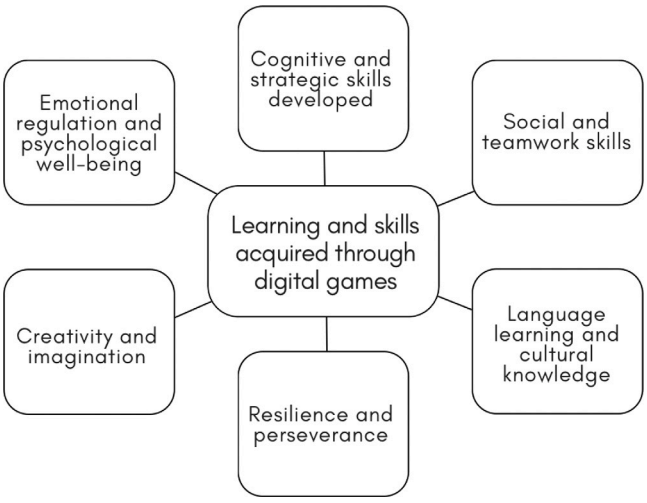

Fig. 1. Emergent themes in the answers to the question "Describe a skill, knowledge or idea you have acquired through video games and how this has been reflected in your offline life", analysed to approach SO1 ($N = 627$).
Source: Developed by the authors.

3. Results

The analysis of participants' narratives revealed two overarching thematic domains emerging from the data. The first concerns the perceived learning and skills acquired through video games, encompassing six subthemes (see Fig. 1). The second domain addresses perspectives on the future of digital spaces and gaming, which comprises five subthemes. Overall, the results highlight that players see the relationship between play, learning, and digital culture as complex and, sometimes, ambivalent. The following sections critically examine each thematic domain in detail, supported by illustrative quotations from participants.

Before exploring the emerging themes from the qualitative data in detail, it is important to note that player perceptions varied considerably. Although most participants described positive impacts and rich learning experiences, some do not perceive any significant influence or considered games to be "just entertainment" with no learning value. These minority voices remind us that the transfer of skills from gaming to real life is neither universal nor automatic. The following sub-themes reflect the dominant pattern of perceived learning gains. For each selected citation, the specific participant is identified with a number, age and gender data.

3.0.1. Cognitive and strategic skills developed

Many respondents reported perceived improvements in reasoning, quick thinking, and strategy as a result of their gaming habits. Gaming situations that require tactical decisions in seconds and complex problem-solving were seen as sharpening players' minds. For example, one participant highlighted the "improvement in quick thinking and the ability to make decisions under pressure" (P003, 34y, cisgender male) thanks to action/strategy games, noting that in real life this helped in moments that required quick decisions and dealing with the unexpected.

Several players mentioned that strategy, puzzle, or resource management titles taught them to plan and think ahead, then apply those skills in offline contexts. One account illustrates this by playing a puzzle game with a complex narrative (*Fran Bow*[1]), the person "learned to look for solutions in less obvious places", a skill that they now apply "in everyday situations" (P038, 19y, cisgender male) when they need to solve problems. Thus, participants described video games as informal spaces for logical and creative thinking, memory training, multitasking, and other cognitive abilities that players recognise in themselves outside of the game.

3.0.2. Social and teamwork skills

A strong emerging theme was learning social skills, including communication, cooperation, and leadership, through multiplayer games. Participants perceived that playing with others, whether in cooperative teams or competitive environments, taught them how to work in groups and improve coordination with peers. "In *Fortnite*,[2] I learned to work as a team and make quick decisions under pressure, especially in cooperative mode" (P037, 19y, cisgender female), says one player, adding that "these skills have clear reflections in my offline life, such as in situations that require group problem solving".

Several players acknowledge that they were not initially good at collaborating or listening to others, but considered that they "learned to work in a group" (P149, 21y, cisgender female) and communicate better, gaining team spirit. According to the players themselves, participants linked this development to greater confidence in school or professional contexts when carrying out group work. In addition, meeting people from different backgrounds in online games was seen as broadening the interpersonal skills of some participants, helping them to deal with varied personalities and even negative behaviours (such as learning how to respond to toxic players or deal with conflicts). Overall, video games are seen as a social laboratory where players practise collaboration, leadership and communication, bringing better teamwork and empathy skills to real life. As one respondent summed up, "video games end up bringing people closer together" (P170, 22y, cisgender female) in their experience.

3.0.3. Language learning and cultural knowledge

One of the most frequent results of the responses was the perceived acquisition of new concrete knowledge through games, especially in relation to language learning. Many participants emphatically stated that they had learned or improved their English skills by playing. Because most of the games were not translated, many players, including children, had to make an effort to understand English, which was seen as facilitating their comprehension and even communication in that language. "Speaking English [is] a skill I gained from playing video games... It is very much reflected in my daily life" (P072, 18y, preferred not to mention gender), says one young person, pointing out that many in their social circle do not know how to communicate in English, while they have developed this skill.

One participant notes that early exposure to English-language games has contributed to their current ease with the language, as evidenced by strong academic performance and the ability to watch films without difficulty (P089, 24y, non binary). In addition to languages, some games have sparked academic interests: historically accurate or strategy titles have stimulated "an interest in history and geography" (P441, 19y, cisgender female) while quizzes or general knowledge games have helped players learn facts (for example, one participant credits a geography game for getting high marks in the subject without additional effort [P009, 20y, cisgender female]). Even scientific curiosities or facts about nature were mentioned: "I learned a lot about fish, insects and dinosaurs" (P150, 20y, cisgender female), says one player about the knowledge gained in the virtual world. In short, video games function for many as informal learning tools, expanding vocabulary, general knowledge and other literacies in a motivating way. This phenomenon points to a perceived transferability of knowledge from the playful context to educational and professional contexts, something recognised by the players themselves.

[1] Released in 2015. Developed and published by *Killmonday Games AB*.

[2] Released in 2017. Developed and published by *Epic Games*.

3.0.4. Resilience and perseverance

Another set of responses focused on the perceived lessons of perseverance and failure management that games provide. Going through difficult challenges in games, such as restarting after setbacks or repeatedly attempting levels until success, is seen as training in resilience that can be applied to life. "I gained patience and learned not to give up" (P397, 34y, cisgender male), reported one participant sharing that many games require strategic thinking and do not always result in victory. The participant further explained that "it's by making mistakes that you learn", and noted that this mindset has helped cultivate greater patience and cope more effectively with everyday frustration.

Several players referred to this cliché becoming reality: games taught them that "any obstacle can be overcome, even if the solution is not immediate" (P241, 27y, cisgender male) and that trial and error leads to success. One respondent confessed that he used to get easily irritated by defeats, but after weeks of persevering with a difficult game, he learned to deal with frustration and realised that "the more times I make mistakes, the closer I'll be to getting it right... The more I play, the better I get" (P055, 50y, cisgender female), realising that this logic applies to life. Stories of personal achievement through games are common, like beating a level after many attempts and how this is seen as boosting the self-confidence of many players, and making them believe that they can achieve goals if they dedicate themselves.

In some responses, there is even an explicit parallel between gaming and life: "I started to see life as a game, where no matter how many mistakes I make, I will only succeed if I keep trying" (P071, 49y, cisgender female) wrote one participant, indicating that this change in perspective helped them at school and in sports. In short, the gaming experience seems to have instilled values of persistence, tolerance for failure, and patience in many players, something they themselves recognise as beneficial in their daily lives.

3.0.5. Creativity and imagination

Although less frequently mentioned than other topics, players also seem to understand video games as creativity and imagination stimulators. Open-world games, construction games, and games with complex narratives in particular encouraged them to think "outside the box" and be more creative in problem-solving. One participant explained that intricate puzzles in a game were particularly useful to "look for solutions in less obvious places" (P038, 19y, cisgender male), a creative approach that they now apply outside the game. There are also those who use games such as *The Sims*[3] to exercise their artistic streak: one participant said that by building and decorating houses in the game, they discovered a taste for decoration and architecture, training their creativity, which they then employed in real life (for example, decorating their own room [P155, 19y, cisgender female]).

In addition, participants also mentioned social creativity, namely regarding games involving collaborative narratives or role-play, leading players to invent strategies and stories together, which is seen as fostering imagination and improvisation skills. Several respondents came to feel more confident in proposing new ideas or approaching problems from different angles thanks to this creative play. Video games, due to their interactive nature, therefore seem to stimulate creativity, whether logical (solving challenges in an original way) or expressive (exploring identities, building new things). This transfer seems to manifest itself in everyday tasks that require inventiveness, where players claim to use the same strategic and creative logic they apply in games.

3.0.6. Emotional regulation and psychological well-being

Finally, a theme related to emotional skills and well-being emerged from the responses. Several players feel that they have learned, through gaming, to better manage their emotions, especially stress and anxiety, and to find in gaming a means of self-care. "I've acquired ways to calm myself down, that is, I've found solutions in moments of greater pressure" (P019, 19y, cisgender male) shared one participant, referring to strategies they developed in intense gaming situations, now used to stay calm under stress. For some, gaming serves as a mental escape, helping them to temporarily disconnect from real problems and return feeling calmer. One respondent mentioned that in moments of frustration or annoyance, they resort to a simple game, mostly mobile, for a few minutes, and this "calmed me down" (P568, 32y, cisgender male), functioning almost like playful meditation.

In addition, self-esteem and personal confidence are seen as reinforced: one player reported that by being good at a game and receiving praise from friends for it, he began to feel like someone who is fun and good at games, boosting his self-esteem at a time when he needed that validation (P121, 21y, cisgender male). On the other hand, some participants also recognised limitations, noting that they had periods when excessive involvement in games isolated them or negatively affected their mood, but many learned to find balance. Overall, however, the prevailing perception is that gaming has taught emotional soft skills such as emotional resilience, impulse control, and stress tolerance. A clear example is the testimony of a *Counter-Strike*[4] player who, competing under pressure, developed "emotional management" and now considers these emotional skills useful in "any environment" in life (P22, 31y, cisgender male). Thus, video games not only offer fun, but also a safe ground for experiencing frustrations and victories, allowing players to grow emotionally and apply these lessons to their offline well-being.

3.1. Perspectives on the future of digital spaces and gaming

Regarding the future evolution of people's relationship with video games and the digital world, the analysed perceptions reveal a mixture of enthusiasm for technological and social opportunities and concern about potential risks. Each participant mentioned at least one future risk and one future opportunity, allowing us to map the trends in the gaming public's thinking. In general, gamers imagine a future with games that are more integrated into everyday life, more immersive, and advanced, but they question the effects this will have on society.

The main themes that emerged include technological evolution (virtual reality, artificial intelligence), the risks of addiction and isolation, changes in social interaction (both positive and negative), the educational applications of games, and economic and ethical transformations in the gaming ecosystem (systematised in Fig. 2). Below, each sub-theme is explored with illustrative examples of the respondents' views.

3.1.1. Technological evolution and immersive experiences

A dominant theme is the expectation of major technological advances in video games in the coming years, making experiences even more immersive and realistic. Many players predict the consolidation of Virtual Reality (VR) and Augmented Reality (AR), possibly with new sensory stimuli (increasingly photorealistic visuals, simulation of touch, smell, etc.) to create virtual worlds that are almost indistinguishable from reality. "Games will become increasingly realistic and, with the evolution of artificial intelligence, more immersive" (P028, 28y, cisgender female) predicts one participant. This greater immersion is seen as an opportunity to enjoy unique experiences: more engaging, exciting

[3] Game series created by Will Wright, developed by *Maxis*, and published by *Electronic Arts*. *The Sims* 1 was released in 2000 and the current version (*The Sims 4*) was released in 2014.

[4] Counter-Strike is a First-Person Shooter (FPS) game series, currently published by *Valve Corporation*. The first release was in 1999, and the most recent release was *Counter-Strike 2* in 2023.

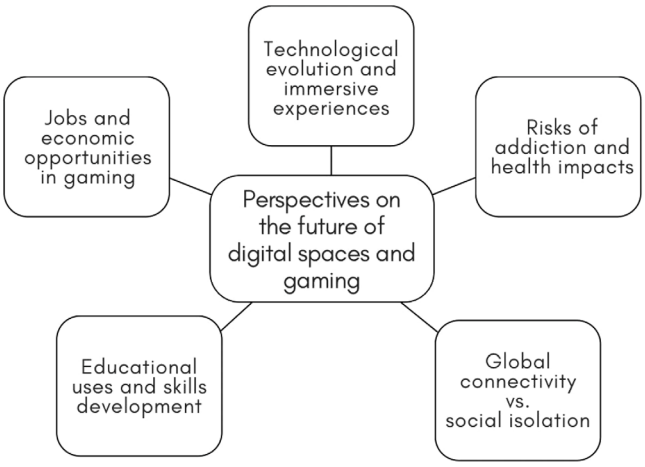

Fig. 2. Emergent themes in the answers to the question "How do you imagine people's relationship with video games and the digital world will evolve in the coming years? Mention a risk and an opportunity that, in your opinion, may arise.", analysed to approach SO2 ($N = 627$).
Source: Developed by the authors.

and "clearly more fun games with increased simulation". Several mention that it will be possible to move between the real and virtual worlds naturally. For example, one player imagines tools that allow for more "natural, more real" (P587, 22y, cisgender male) virtual interactions, increasing realism but without changing the basic reasons why we play (fun, socialising, stress relief). This technological evolution also raises concerns, however. The main fear mentioned is that ultra-realistic experiences will blur the lines between the virtual and the real. Some fear that people will become "too accustomed to this new technology and not realise that real life is not like a game" (P028, 28y, cisgender female), using hyper-realistic virtual worlds as a permanent escape from reality. This in turn raises concerns about alienation: individuals who prefer simulated reality and neglect real life. In extreme cases, the risk of not distinguishing reality from fiction has been mentioned, which could affect behaviour and expectations outside the game. In short, players anticipate a technologically advanced future, saying, for example, that "more personalised and immersive experiences" (P321, 21y, cisgender male) are appearing, but they maintain a critical view of the impact that this immersion may have on mental health and the ability to connect with the real world, pointing to the need for balance.

3.1.2. Risks of addiction and health impacts

Among the most frequently cited risks are problems with video game addiction and its consequences. Participants demonstrate a keen awareness that excessive gaming can lead to behavioural dependency, sometimes comparing it to other addictions. One respondent described "addiction to the extreme" as someone who "loses all their time, money, sanity, and social relationships because they are hooked... on something that is not real" (P086, 19y, cisgender female). This powerful image encapsulates the fear that, in a future with increasingly immersive games, certain people may lose control: neglecting their studies, work, social life, and physical/mental health in favour of gaming. In fact, sedentary lifestyles and associated health problems (like early sedentarisation) were mentioned in several testimonials as a growing threat. "I believe there is an increased risk of social disconnection... and mental health problems", noted one participant (P417, 24y, cisgender male).

Players also fear that the normalisation of intensive gaming will make it harder to stop playing: "it can be difficult for some people to manage their time between playing and living offline... it can be harder to stop playing" if games become increasingly attractive (P517, 20y, cisgender female). Several cited examples close to home, who already show signs of addiction, and predicted that this "will get worse over time" (P555, 22y, cisgender male), possibly becoming a public health problem for young people. Some participants adopted a prescriptive tone, suggesting the need for moderation and parental control in the future. Notably, despite these warnings, many counter that gaming, when balanced, can be a positive hobby. The key, according to one player, is that "an addiction is not a positive thing... but if it doesn't become an addiction and is just a tool or pastime, it can be quite positive" (P427, 20y, cisgender female). In other words, the gaming community itself recognises the fine line between healthy and pathological use, demonstrating reflexivity about the risks of addiction in the future digital landscape.

3.1.3. Global connectivity vs. Social isolation

One ambivalent aspect of visions for the future is the impact of video games on social interactions. On the one hand, there is a strong belief that games and the digital world will bring people closer together globally, creating inclusive virtual communities. Several participants see a great opportunity in the ability of games to connect people from different parts of the world, crossing physical and cultural barriers. "I see... a great opportunity to promote inclusion and empathy. Games and digital platforms can connect people from different parts of the world, enabling cultural exchanges and the sharing of ideas" (P112, 19y, cisgender female), says one player. In some participants' imagined future, virtual spaces could function as social hubs for diverse groups, for example, people who are discriminated against in real life finding acceptance online, or niche communities flourishing. In fact, some participants mention already having formed lasting digital friendships through games that have helped them through difficult times in their lives.

On the one hand, many participants recognise the potential of games as tools for social cohesion, especially as they become more mainstream and socially integrated. One participant writes that in the coming years, video games will be "even more integrated into social life, promoting virtual interactions that connect people around the world" (P035, 18y, cisgender male), facilitating encounters that would not otherwise happen. In this positive view, the digital world can even combat loneliness and create new community ties. On the other hand, there is a strong fear of social isolation and the breakdown of face-to-face relationships. Numerous respondents pointed out that, if poorly balanced, increasing digital immersion can lead people to "prefer virtual worlds to real-life interaction" (P154, 47y, cisgender male), exacerbating the distance between them. The scenario of young people locked in their rooms, unskilled in face-to-face communication, and who "forget contact with the outside world" was frequently cited. Some warn of a decline in empathy and "real" social skills if socialising shifts too much online. "As virtual worlds become so attractive, some people may prefer them to real-life interaction. The balance between the two will be crucial" (P038, 19y, cisgender male), reflects one participant, summing up this dilemma. Several responses explicitly mention the risk of extreme isolation and difficulty in maintaining interpersonal relationships in the future. In summary, players are divided between seeing games as bridges that connect people or walls that separate them, and many recognise that both can happen in parallel. The overall view is that the future will bring more digital connection, but will require awareness so as not to sacrifice face-to-face human interaction.

3.1.4. Educational use and skills development

Many participants imagined a future in which video games, including their intentional use for educational purposes, could take on a more constructive role in society. As players who have experienced first-hand the learning opportunities offered by games (languages, logic, etc.), they see a clear opportunity to explore this didactic nature of games on a large scale. "One opportunity that may arise is the use of games for educational purposes" (P275, 23y, cisgender male), wrote one respondent. Other participant specifically noted that they feel impacts

on their reasoning already, through the activity of play ("I really enjoy playing *Sudoku*" [P323, 20y, cisgender female]). Several suggest that traditional teaching is outdated and that "video games may be the most fun and educational way to teach certain topics to students" (P009, 20y, cisgender female). In this imagined future, serious games and playful platforms would be incorporated into schools, vocational training, and even therapy, making learning more interactive, engaging, and accessible. One participant explicitly mentioned the possibility of games helping to train people for digital professions or teaching leadership and strategy skills in a simulated way (P040, 20y, cisgender male). Another participant proposed the use of games in nursing homes as a means of promoting mental stimulation, particularly to address cognitive decline and potentially reduce the risk of dementia (P005, 18y, cisgender male). Several respondents highlighted research supporting the cognitive benefits of playful engagement in later life. These views demonstrate a socio-critical perception of gamers: they recognise that games need not be confined to entertainment, but can be powerful tools for education, cognitive development, and even therapy. Nevertheless, , even optimists note that realising this positive potential depends on how games are used. Almost all mentions of educational opportunities were accompanied by some caveat about balanced use. For example, one participant states that educational benefits are realised if "we use [games] in a balanced and deliberate way, without becoming addicted" (P010, 19y, cisgender female), otherwise even good initiatives can be lost. In addition, some point out that the educational value of games already exists but needs recognition. "Games have the potential to be used as learning tools, allowing skills to be acquired in an interactive and practical way" (P036, 19y, cisgender female), wrote one respondent, but immediately pointed out that there is a parallel risk of social disconnection if we rely solely on digital technology.

In short, we can anticipate a future in which we learn more through play, whether it be school subjects, languages (as is already the case) or even emotional skills. Players see this as a golden opportunity for society, highlighting personal success stories (improving geography grades through a game, for example). But they also take a critical view: they warn that reaping the educational benefits will require intentionality and care so that games do not merely serve as an easy escape or completely replace real experiences that they consider necessary.

3.1.5. Jobs and economic opportunities in gaming

The future of video games was also linked to changes in the economic and professional spheres. Several participants mentioned that the gaming sector is growing rapidly and that this translates into new job and income opportunities. Today, there are already professional gamers, streamers, YouTubers, developers, designers, testers, among other related careers, and many predict that these options will expand and become more common. "It is still a very new market with countless job opportunities, from professional gamer to streamer, to all the business jobs that result from the sector" (P022, 31y, cisgender male), says one gamer, confident that the gaming industry will bring more and more specialised jobs. Several young participants even see gaming as a possible career path or mention knowing people who already make a living from it, something they considered unthinkable a few decades ago, but which will become normal in the future. There are also those who highlight the financial opportunity for ordinary players themselves: earning money by playing through digital platforms, tournaments, content creation, or trading virtual items. One respondent summed up this idea simply: one of the positive aspects from now on will be "being able to earn money" (P019, 19y, cisgender male) associated with video games.

However, not everything is seen as positive in this economic landscape. Critical concerns have emerged around excessive commercialisation and questionable practices in the industry. Some players lament that nowadays "the playfulness of video games is no longer the ultimate goal", having been replaced by "commercial exploitation" of the medium (P006, 22y, cisgender male). Projecting this trend into the future, they fear the worsening of predatory monetisation tactics. "Nowadays there is... commercial exploitation... this is dangerous when predatory monetisation tactics are employed that exploit younger or more susceptible people" warned the same participant in a blunt reflection. Examples cited include abusive microtransactions, loot boxes, gacha games, and other strategies that are seen causing players (especially children/teenagers) to spend excessive amounts of money or engage in addictive schemes comparable to gambling. This scenario creates two risks: on the one hand, exclusion: "in the future, an average player will have even more difficulties... because they will have to spend a lot of money to reach an acceptable level" (P009, 20y, cisgender female), predicts one respondent, suggesting that pay-to-win could create inequalities between players. The normalisation of these mechanics can accentuate financial addiction, as noted in the reference to casino style games. Participants highlighted the need for ethics and regulation in the industry: they mention the need for intervention in these issues and are concerned with issues such as job losses due to automation or digital crime, which would require social control measures in the future. At the same time, participants also recognise a socio-economic benefit: several value "this sense of community that so many games offer" for free (P006, 22y, cisgender male), demonstrating that the gaming economy is not seen solely as exploitation. There are also valued initiatives, events and collective creations driven by gaming communities that are seen as worthy of preservation.

4. Discussion

Drawing on the contemporary social relevance of video games, this study explored Portuguese players' perceptions of learning, transferability, and the future of gaming and online spaces. The RTA [56, 57] enabled a critical interpretation of how participants made sense of game-related skills, their possible transfer to everyday life, and the tensions between perceived benefits and risks such as addiction, alienation, and social isolation.

Overall, participants described games as meaningful spaces for informal learning, but not in an uncritical or universal way. The findings suggest that the unrealised educational potential of games may be less related to learners' resistance than to interventions that are insufficiently situated, echoing Papert's [60] critique of technocentrism [60]. Players identified cognitive, social, emotional, cultural, and creative skills that they associated with gameplay and perceived as transferable to everyday life. Yet minority accounts are analytically important. When some participants framed games as "just entertainment", or associated play with toxic behaviours and conflict, they complicated the dominant positive narrative. These accounts show that transfer is not automatic, universal, or necessarily desirable. The study therefore captures both perceived possibilities of transfer and their limits.

When some participants described games as "just entertainment", or associated play with toxic behaviours and conflict, they complicated the dominant positive narrative by showing that transfer is not automatic, universal, or necessarily desirable. The study, therefore, captures perceived possibilities of transfer but also its boundaries and ambivalences. These minority positions are not residual but help delimit the scope of the findings.

Participants particularly highlighted cognitive skills and strategic thinking, often linking them to complex gameplay and tactical decision-making. Moreover, they often saw these skills as useful for dealing with unpredictable everyday situations. The frequent frustration experiences that characterise interaction with most games [61] were also seen as vital and transferable through notions of resilience, self-confidence, or self-efficacy. Players also described games as relevant to emotional regulation. Significantly, game-playing was perceived as a self-care strategy and, as mentioned by one player, a sort of "playful meditation". These findings reinforce the adaptive characteristics of escapism through games previously described by Kosa and Uysal [62]

and Stenseng et al. [63], emphasising players' own perceptions to this extent.

Also around SO1, games were perceived as vehicles to develop cultural knowledge and language-related skills. In this aspect, games' historic accuracy, for example, emerged as a relevant learning and engagement factor. This also resonates with Costa et al. [64], who locate cultural value not only in playing but also in collaborative game creation. The notions of creation and creativity are, in a cyclic manner, sustained by the findings of the present study, according to which daily playing is seen as relevant in "thinking outside of the box" in other areas of life, even reinforced in collaborative games.

Conversely, the analysed qualitative data also allowed the exploration of the perceived future of gaming and online spaces, simultaneously focused on risks and opportunities (SO2). From this perspective, several tensions and paradoxical players' perspectives emerged. On the more optimistic end of the spectrum, this envisioned future is associated with increasingly sophisticated and immersive experiences, which are seen as opportunities to expand educational and economic opportunities for players. The idea of immersion was frequently seen by players as associated with the realism provided by hardware and software evolution, that may allow a more natural transition between reality and virtuality in play experiences. Nevertheless, this also sustains a concern regarding this transition, expressed by how the "line" between a game and the real world might be blurred, with the concept of alienation frequently moderating this notion. Educational and economic potentials were also seen in a dichotomous manner by players, with learning and financial growth on one side, and difficulties in Digital Life Balance (DLB) or predatory schemes (e.g., loot boxes, abusive microtransactions, etc.) on the other. Previous research, as the one from Lima-Costa et al. [65] also corroborates the relevance of DLB in the definition of dysfunctional media use.

Also in the exploration of SO2, it was possible to identify risk of addiction and potential health impacts as perceived risks for the future of gaming. However, players showed a critical perspective in this sense, mentioning again balance as possible, and preferable to complete withdrawal from playing. This vision is not only aligned with general notions around DLB that were previously mentioned [65], but also with the premises of Anne Mette Thorhauge [66]. According to the author, problem gaming mainly emerges as a potential relationship between the lack of well-being and consequential gameplay patterns in one's daily life, often mediated by the absence of reflexivity and satisfactory life strategies [66].

Finally, the emergent themes in the analysed data also show a connection to the previously discussed conceptual work from Turkle [46]. This is explained by players' perceived paradox between global connectivity and social isolation in the digital world, acknowledging that games can function simultaneously as bridges and walls to different social activities.

4.1. Implications

The findings reinforce the value of approaching video games as multidimensional cultural artefacts with educational, emotional, and social implications. However, these implications should be interpreted differently for commercial entertainment games and intentionally designed educational or serious games. The present data mostly concern everyday play with entertainment-oriented games, where learning emerged as an indirect and self-perceived outcome rather than as a predefined pedagogical goal.

This distinction is important for educators and policymakers. Commercial games may complement formal and informal education when they support autonomy, creativity, reflection, and engagement, but their educational value cannot be assumed simply because players perceive learning. Pedagogical mediation remains necessary if game-based experiences are to support active and reflective learning. The reported development of cognitive, emotional, social, and strategic skills suggests that playful experiences may foster problem-solving, collaboration, perseverance, and self-regulation when used deliberately and critically.

The findings also point to gaming as a possible mechanism for emotional regulation and self-care, particularly among younger players. At the same time, participants' awareness of addiction risks, commercial exploitation, and social isolation highlights the need for ethical industry practices and critical digital literacy. Future research should continue to examine how gaming-related skills may become transferable competences for education, employment, well-being, and social participation.

5. Conclusion

This study examined how Portuguese players perceive learning, transferability, and future developments in video games and online environments. Participants recognised diverse forms of self-perceived learning through gaming, including cognitive and strategic reasoning, social collaboration, creativity, and emotional regulation. These perceived gains include cognitive and strategic reasoning, social collaboration, creativity, and emotional regulation, reinforcing the view of games as relevant contexts for informal learning and self-development. The results also support the idea that games can extend beyond entertainment, functioning as a space for experimentation, self-expression, and resilience-building.

At the same time, participants' reflections on the future of gaming reveal ambivalence between optimism and concern. While many envision more immersive, inclusive, and educational digital spaces, others warn of risks related to addiction, alienation, and commercial exploitation. These findings underline that the evolution of gaming culture will depend on maintaining balance between technological innovation, ethical responsibility, and human well-being.

Overall, the study contributes to the growing body of research that approaches digital play from a socio-critical perspective, emphasising players' voices, and recognising games as performative cultural practices that participate in identity construction and social interaction. Understanding players' perceptions enriches current debates on games, learning and digital citizenship, reinforcing the need for reflective, inclusive, and responsible engagement with digital play in contemporary societies.

5.1. Limitations and future directions

Although this study gathered a large and diverse sample, it is limited by its reliance on self-reported perceptions. Participants' reflections may not correspond directly to measurable learning outcomes or objective skill transfer, which restricts the generalisability of the findings. The use of open-ended questions supported thematic exploration but did not capture the depth of individual experiences that could emerge through interviews or longitudinal observation.

The sample was also restricted to Portuguese-speaking players, which may reflect culturally specific interpretations of play and learning. Participants' references to English-language learning, non-translated games, and the ambivalent status of games as both entertainment and learning resources suggest that these perceptions are culturally and linguistically situated. The findings should therefore be transferred cautiously to contexts with different gaming cultures, language ecologies, and educational norms. Potential convenience and network bias linked to recruitment through university students should also be considered when interpreting the findings.

Future research could address these limitations by combining qualitative self-perceptions with experimental or performance-based measures of learning transfer. Comparative studies across cultural contexts would also contribute to a broader understanding of how sociocultural variables influence perceptions of learning through games. Additional research is needed to explore the long-term implications of gaming for

emotional well-being, identity formation, and digital life balance, particularly as immersive technologies evolve. Expanding interdisciplinary collaboration between education, psychology, and media studies will remain essential to advance critical perspectives on digital play and its role in contemporary learning ecologies.

CRediT authorship contribution statement

Carla Sousa: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ana Filipa Oliveira:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Mustafa Can Gursesli:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization. **Amanda Cei Santos Pirola:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Ege Anbar:** Writing – review & editing, Writing – original draft, Methodology. **Paulina Tsvetkova:** Writing – review & editing, Supervision. **Pedro Pinto Neves:** Writing – review & editing, Supervision.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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