

**Loot boxes in the video game industry: digital capitalism,
psychosocial risks, and socio-educational responses**
**Las loot boxes en la industria del videojuego: capitalismo digital, riesgos
psicosociales y respuestas socioeducativas**
**As loot boxes na indústria dos videojogos: capitalismo digital, riscos
psicossociais e respostas socioeducativas**

Diego Fernández Piedra

Universidad Complutense, Madrid. Energy Control. Spain.

<https://orcid.org/0000-0002-3138-9827>

diefer05@ucm.es

Enrique Gallego Granero

Universidad Complutense, Madrid. Spain.

<https://orcid.org/0000-0003-0969-4363>

enrigall@ucm.es

Gerardo Gonzalo Mier

Universidad Coimbra, Portugal.

<https://orcid.org/0000-0003-4734-6888>

gerardogonzalomier@gmail.com

Berta de la Vega Moreno

Energy Control. Spain.

<https://orcid.org/0000-0002-8156-0207>

bvega@energycontrol.org

Abstract

Over recent decades, the video game industry has undergone a profound structural transformation associated with the expansion of digital capitalism and the consolidation of continuous monetisation models. Within this context, loot boxes have emerged as one of the most widespread mechanisms, prompting significant ethical, social, and legal debate due to their structural similarities to gambling and their potential influence on players' behaviour. This article presents a psychosocial analysis of the phenomenon based on a documentary review of recent scientific literature. It explores their historical development, their position within the political economy of digital leisure, the available empirical evidence concerning psychosocial risks, and the regulatory responses that have begun to emerge. In addition, it advances a critique of the logic of unlimited profit that enables their normalisation in the absence of effective regulation, while proposing an alternative approach grounded in digital literacy, informational transparency, and education for responsible use. The findings indicate that loot boxes function as a paradigmatic mechanism of value extraction in digital environments and as a means of reproducing broader capitalist dynamics, carrying significant implications for consumer protection, particularly in relation to minors. The

article concludes by outlining the role that public policy should assume through the combined use of regulatory measures and socio-educational strategies to address this phenomenon in a comprehensive manner, avoiding processes of stigmatisation and negative framing.

Keywords: Video games, Cultural Industry, Digital Education, Loot boxes, Gambling, Digital Capitalism, Microtransactions.

Resumen

En las últimas décadas, la industria del videojuego ha experimentado una transformación estructural vinculada a la expansión del capitalismo digital y a la consolidación de modelos de monetización continua. Entre ellos, las *loot boxes* se han convertido en uno de los mecanismos más extendidos, generando un intenso debate ético, social y jurídico debido a su semejanza estructural con los juegos de azar y a sus posibles efectos en la conducta de las personas jugadoras. El siguiente artículo ofrece un análisis psicosocial del fenómeno mediante revisión documental de literatura científica reciente. En él se examina tanto su evolución histórica como su inserción en la economía política del ocio digital, las evidencias empíricas sobre riesgos psicosociales y las respuestas regulatorias emergentes. Asimismo, incorpora una crítica a la lógica de beneficio ilimitado que favorece su normalización sin regulación efectiva, proponiendo una alternativa centrada en la alfabetización digital, la transparencia informativa y la educación para el uso responsable. Los resultados muestran cómo las *loot boxes* constituyen un dispositivo paradigmático de extracción de valor en entornos digitales y reproducción de lógicas capitalistas, con implicaciones relevantes para la protección de consumidores, especialmente menores. A modo de conclusión se presenta el papel que las políticas públicas deben tener combinando regulación y estrategias socioeducativas para abordar de forma integral este fenómeno, huyendo de estigmas y negativizaciones.

Palabras clave: Videojuegos, Industria cultural, Educación digital, *Loot boxes*, Gambling, Capitalismo digital, Microtransacciones.

Resumo

Nas últimas décadas, a indústria do videojogo tem passado por uma transformação estrutural ligada à expansão do capitalismo digital e à consolidação de modelos de monetização contínua. Entre eles, as *loot boxes* tornaram-se um dos mecanismos mais difundidos, gerando um intenso debate ético, social e jurídico devido à sua semelhança estrutural com os jogos de azar e aos seus possíveis efeitos no comportamento das pessoas jogadoras. O presente artigo propõe uma análise psicosocial deste fenómeno através de uma revisão documental da literatura científica recente. Nele, examina-se tanto a sua evolução histórica como a sua inserção na economia política do lazer digital, as evidências empíricas sobre riscos psicosociais e as respostas regulatórias emergentes. Além disso, apresenta-se uma crítica à lógica do

lucro ilimitado que favorece a sua normalização sem regulação efetiva, propondo uma alternativa centrada na literacia digital, na transparência informativa e na educação para um uso responsável. Os resultados mostram como as loot boxes constituem um dispositivo paradigmático de extração de valor em ambientes digitais e de reprodução de lógicas capitalistas, com implicações relevantes para a proteção dos consumidores, em especial dos menores. Como conclusão, destaca-se o papel que ases políticas públicas devem desempenhar, combinando regulação e estratégias socioeducativas para abordar este fenómeno de forma abrangente, evitando estigmas e enquadramentos negativizantes.

Palavras-chave: Videojogos. Indústria cultural, Educação digital, *Loot boxes*, Gambling, Capitalismo digital, Microtransações

Introduction

The growth of the video game industry in the twenty-first century cannot be explained solely by technological innovation or the expansion of digital entertainment. As Zuboff (2019) argues, it is within the broader framework of digital capitalism, characterised by the continuous monetization of user experience, the systematic extraction of data, and the maximization of time spent on interactive platforms. In this way, video games cease to operate as delimited cultural products and instead become devices for capturing attention and revenue within platform capitalism, where profitability rests on extending user interaction and on the continuous extraction of value through microtransactions, a process that Nieborg and Poell (2018) describe as the platforming of cultural industries.

Under this emerging economic logic, *loot boxes* (random virtual rewards accessible through real money or digital currency) have become a key mechanism in the current transformation of interactive leisure, as they articulate new forms of monetization and value extraction in gaming environments (Zendle & Cairns, 2018), reproducing the dominant capitalist logic. King and Delfabbro (2019) warn that these mechanics constitute a key component in the reconfiguration of video game monetization models, shifting the core of profitability from selling the product to the sustained exploitation of the relationship with the player. In this framework, *loot boxes* (see Figure 1) acquire a particular relevance as devices that intensify this logic by introducing random rewards tied to repeated spending, reinforcing prolonged consumption dynamics within the gaming experience.

Figure 1

Loot box image



Note. Taken from depositphotos.com.

Recent research interprets this shift as part of the transition from upfront-payment schemes to free-to-play models articulated around microtransactions, recurrent spending, and the continuous offer of additional content such as cosmetic items, downloadable expansions (DLC), or other digital goods that extend monetization beyond the videogame's initial experience (Lundy et al., 2023).

As these forms of monetization became increasingly important, scientific, political, and social spheres are beginning to ask questions, particularly toward the end of the 2010s, when several national regulatory authorities, especially in Europe, started to question their structural proximity to traditional gambling. In this context, Zendle and Cairns (2018) empirically show that spending on *loot boxes* is associated with higher levels of problematic gambling, placing these mechanics at the centre of debates about their psychosocial implications, the monetization logics that make them possible, their economic intentionality, and their capacity to shape players' consumption practices.

Along similar lines, Drummond and Sauer (2018) pointed out that these mechanics bear a functional resemblance to gambling, understood as the staking of money or valuable objects on events with uncertain outcomes with the expectation of reward (Griffiths, 2005). More than a superficial coincidence, this relationship lies in the reproduction of characteristic mechanisms of both phenomena, such as variable reinforcement, outcome uncertainty, and voluntary economic participation, all of which favor the repetition of the spending behavior. This interpretation was later expanded by Griffiths (2019), who situated *loot boxes* within a continuum of gambling behaviours mediated by digital technologies. Subsequent studies confirmed the consistency of these associations across different cultural contexts and age groups (DeCamp & Daly, 2023). These previous authors also observed a significant presence of *loot box* spending among adolescents, while Drummond et al. (2020) replicated the association with problem gambling in independent samples. Wardle and Zendle (2021) also highlight the relevance of the regulatory and social context in shaping these behaviours.

From a conceptual point of view, Nielsen and Grabarczyk (2019) propose placing *loot* boxes within the category of random reward mechanisms, distinguishing between those isolated from real-world economies and those integrated into virtual markets with transferable monetary value. This is crucial for interpreting when such practices may functionally approximate gambling and therefore require specific regulatory frameworks, as emphasised by King and Delfabbro (2019). At the same time, it allows them to be understood as devices of behavioral monetization and of the normalisation of spending in a digital environment, thus broadening the focus from legal regulation to the need for educational strategies, digital literacy, access to information, and the implementation of risk- and harm-reduction strategies.

In this direction, some studies have begun to understand *loot* boxes beyond a strictly biomedical approach. In economic terms, King and Delfabbro (2018) warn that they should be interpreted within an ecosystem of persuasive design aimed at maximising user spending. Petrovskaya and Zendle (2022), along the same lines, show that perceptions of fairness or legitimacy of the microtransactions directly influence willingness to spend, linking psychological dimensions with economic and cultural factors. On the psychosocial level, Drummond et al. (2022) report that people who purchase *loot* boxes are approximately 1.87 times more likely to experience severe psychological distress than those who do not, a difference that remains even after controlling for sociodemographic variables, spending on other digital content, and symptoms of problematic gambling. This finding suggests that the relationship between purchasing *loot* boxes and psychological discomfort cannot be attributed solely to individual vulnerabilities or pre-existing problematic gambling but also points to psychosocial factors linked to their design and to the monetisation logics that structure these digital environments.

Hence, nowadays, the academic debate oscillates between prohibitionist approaches and preventive approaches based on digital education and informational transparency. Couldry and Mejias (2019) situate this tension within the extractive dynamics of data capitalism, while Zuboff (2019) warns of the risks of economic models that prioritize behavioural capture over social protection. Understanding *loot* boxes requires, therefore, the integration of public health, political economy, and digital culture perspectives.

Despite the growing volume of research on *loot* boxes and video game monetization, there is an analytical fragmentation between biomedical approaches focused on individual risk, economic analyses, and regulatory approximations, making it difficult to achieve a real comprehensive understanding of their psychosocial implications within the context of digital capitalism (Gutiérrez-Manjón et al., 2026; Veiga et al., 2025).

In this context, based on the pointed interpretative framework, the present article proposes to analyze *loot* boxes as an expression of the continuous monetization characteristic of digital capitalism as applied to video games (Srniczek, 2017). It also examines, within this same framework, the available research on their psychosocial risks and their relationship with gambling, and finally proposes an alternative approach based on education, digital literacy, and transparency as a complementary, not exclusively substitutive, response to regulatory strategies of prohibitionist character (King & Delfabbro, 2019).

Methodology

This article adopts a qualitative approach of descriptive character based on a critical review of the scientific literature on *loot* boxes, digital monetization, gambling, and the political economy of video games. As Grant and Booth (2009) note, literature reviews allow to integrate dispersed knowledge and conceptually structure emerging fields of research. In the same line, Torracco (2005) highlights their usefulness in developing interpretive frameworks in areas where empirical evidence is distributed across different disciplines, while Snyder (2019) emphasises their capacity to synthesise existing knowledge and generate new theoretical interpretations of the phenomenon under study.

The literature search was conducted in international academic databases (Scopus, Web of Science, and PsycINFO) using combinations of terms related to *loot* boxes, digital monetization, gambling, and the regulation of video games, selecting peer-reviewed articles published mainly between 2016 and 2025. The inclusion criteria were: (a) empirical studies on spending on *loot* boxes or their relationship with gambling; (b) theoretical research on digital monetization in video games; and (c) studies focused on regulation, public health, or digital education linked to the phenomenon. Publications without scientific peer review or focused exclusively on technical aspects of video game design were excluded. The final selection of literature was based on its thematic relevance, academic impact, and conceptual contribution to the analysis of the phenomenon, prioritising widely cited studies and recent work on digital monetization in video games.

Afterwards, a thematic analysis was carried out to identify recurring patterns in the literature, conceptual relationships between variables, and open debates in the field (Braun & Clarke, 2006; Terry et al., 2017). From this analytical procedure, three main interpretive axes emerged: (1) the economic transformation of video games within the framework of digital capitalism, (2) the psychosocial risks associated with *loot* boxes and their relationship with gambling, and (3) the regulatory and socio-educational responses proposed in recent research. These axes structure the analysis developed in the following sections.

This methodological approach does not seek to establish statistical causality, but rather to systematise existing knowledge and generate a critical interpretation of the phenomenon in its socioeconomic context.

Digital capitalism and the economic transformation of video games

From cultural product to platform for value extraction

For much of their history, video games were configured as cultural goods whose acquisition involved a one-off payment in exchange for a complete experience. However, the progressive digitalisation of distribution, the generalisation of permanent connectivity, and the integration of data infrastructures have transformed this model towards economies based on continuous services, constant updates, and fragmented monetization. Srnicek (2017) describes this process as part of the expansion of platform capitalism, characterised by the capture of user data and the generation of revenue from prolonged participation in digital ecosystems.

Nieborg and Poell (2018) identify this transition as a process of cultural platforming, where economic logic shifts value from the product towards sustained interaction, reconfiguring the forms of production, consumption, and value generation in digital leisure, increasingly articulated through the purchase of additional content, or upgrades that accelerate progress, reduce waiting times... or access to advantages that would otherwise not be available.

Loot boxes constitute a paradigmatic manifestation of this structural transformation, as they introduce random reward systems tied to repeated economic transactions capable of generating recurring income without the need to produce substantial additional content. In this sense, King and Delfabbro (2018) point out that these mechanisms entail a qualitative change in video game monetization models by relying on psychosocial principles akin to those observed in gambling. In this way, profitability thus ceases to depend exclusively on the quality of the cultural product and becomes linked to the design of systems oriented towards maximizing user spending over time, configuring a form of accumulation based on extending consumption within digital environments.

However, the consolidation of this model does not depend solely on its economic performance, but also on the levels of social legitimacy it is able to generate. Several studies have shown how certain microtransaction models are perceived by players as aggressive or manipulative practices, giving rise to tensions between economic innovation and cultural acceptance, as well as to negative attitudes toward video games themselves (Petrovskaya & Zendle, 2022). Likewise, Xiao et al. (2023) emphasize that transparency in reward systems significantly influences consumer trust. These elements place *loot* box-based monetization in a terrain of increasing social and regulatory problematization that transcends its strictly economic dimension.

In line with this monetization logic, the experimental evidence indicates that the probabilistic structure of *loot boxes* and certain design elements of *loot boxes* bias spending decisions and increase demand (Cordes et al., 2024), while rare rewards trigger stronger arousal responses and a greater urge to continue opening boxes, thereby reinforcing persistent consumption (Larche et al., 2021). *Loot* boxes functioning, therefore, need to be understood beyond a mere commercial strategy, opening a field of inquiry into their psychosocial and regulatory implications.

Cultural normalization and the expansion of access

The contemporary expansion of *loot boxes* is part of the cultural normalization processes that have incorporated random reward mechanics into everyday recreational experiences (Zhang et al., 2021). Their presence in widely distributed video games, including those aimed at young audiences, has contributed to naturalizing chance-based forms of obtaining items within digital leisure environments. In this context, DeCamp and Daly (2023) document significant adolescent participation in these systems, while Xiao (2021) describes the consolidation of virtual markets in which the items obtained acquire symbolic, social, and even monetary value. Similarly, in other fields related to consumption and risk practices, studies on

phenomena linked to substance use have shown how media treatment contributes to constructing specific social narratives about danger and responsibility (Fernández et al., 2023).

Within this same process of normalization, early exposure to dynamics resembling gambling contributes to blurring the boundaries between play and betting. Griffiths (2019) warns that the convergence between video games and digital gambling is part of a broader hybridization of interactive leisure, while Wardle and Zendle (2021) highlight the relevance of the regulatory context and the configuration of the associated risks. This progressive blurring of boundaries shifts the problem from the domain of design to that of its possible psychosocial effects, placing *loot boxes* at the centre of emerging concerns about well-being, vulnerability, and the regulation of digital leisure.

From a critical perspective, Couldry and Mejias (2019) interpret these dynamics as an expression of data capitalism oriented toward the continuous extraction of value from the everyday activity of users. In line with this view, Zuboff (2019) argues that economic models based on behavioural capture tend to expand even in the absence of consolidated regulatory frameworks. Applied to the field of video games, this suggests that the normalization of *loot boxes* responds not only to their economic profitability, but also to a structural rationality that prioritises the expansion of the digital market even when this comes into tension with preventive protection, well-being, and consumer rights.

Thus, the economic transformation of video games and the cultural normalization of *loot boxes* evidence the insertion of these mechanics into broader dynamics of digital capitalism, traversed by power relations that organise the capture of attention, the steering of behaviour, and the extraction of value in connected leisure environments (Couldry & Mejias, 2019; Srnicek, 2017).

Psychosocial risks, gambling, and the political economy of *loot boxes*

Scientific research on *loot boxes* has primarily focused on their possible relationship with problematic gambling behaviours, forming one of the most consistent empirical cores of the recent literature. In this context, Zendle and Cairns (2018) showed, through correlational analyses in adult populations, that spending on *loot boxes* was significantly associated with higher levels of problematic gambling, a finding that marked a turning point in the study of monetization in video games. Drummond et al. (2020) later replicated this association in independent samples, reinforcing the consistency of the statistical link between both variables. Beyond its strict psychological dimension, these findings opened a field of debate on the way certain digital monetization strategies may articulate with gambling-like dynamics, placing the issue on a plane that exceeds individual vulnerability and points to structural conditions within gaming environments. The causal direction of this relationship remains under debate. While some studies suggest that *loot boxes* may act as a gateway to dependency-like relations, others propose that individuals with a greater propensity toward gambling are also more likely to spend on random reward systems. In this regard, King and Delfabbro (2018) argue that the available research does not allow for a direct causal relationship to be established, although it does confirm the presence of shared risk factors such as sensation seeking, impulsivity, and sensitivity to variable reinforcement.

This debate becomes more complex when considering the exposure of minors to the phenomenon. DeCamp and Daly (2023) documented that a significant proportion of adolescents interact with *loot boxes*, sometimes involving real-money spending. Wardle and Zendle (2021) warn that such early contact with gambling-like dynamics may contribute to the normalization of betting practices during formative stages, while Calado and Griffiths (2016) point out that early initiation into gambling is one of the most consistent predictors of later problems. In this framework, *loot boxes* transcend their economic dimension and become part of trajectories of behavioural vulnerability linked to the everyday incorporation of reward and chance logics, known as gamification processes (Belli, 2024).

From the perspective of behavioural economics, understood as the study of how cognitive biases and decision contexts influence economic behaviour (Thaler & Sunstein, 2008), experimental evidence indicates that the probabilistic opacity of rewards and certain design elements bias economic decisions and increase demand (Cordes et al., 2024), and that the combination of intermittent reinforcement and intense audiovisual stimuli favours persistent spending (Larche et al., 2021). These results reveal psychological consequences that exceed the economic dimension of the phenomenon and foreshadow its possible effects in terms of psychological distress and public health.

On the psychosocial plane, recent research reinforces this concern (Wardle & Zendle, 2021; Zendle & Cairns, 2018). Drummond et al. (2022) found that people who purchase *loot boxes* are more likely to experience severe psychological distress than those who do not, a difference that remains even after controlling for sociodemographic variables, spending on other digital content, and symptoms of problem gambling. This finding suggests that the association between participation in these dynamics and psychological distress cannot be explained solely by pre-existing individual vulnerabilities but also points to psychosocial factors linked to their design and to the monetization logics that structure these digital environments.

In this regard, several authors warn against reductionist interpretations framed exclusively in health terms. Fernández et al. (2025) show that these phenomena should be understood as complex sociocultural configurations rather than merely as individual disorders; similarly, King and Delfabbro (2019) locate the risks in economic structures oriented toward encouraging continued spending, while Nieborg and Poell (2018) link them to the platforming of video games and the sustained monetization of users' activity.

Education, digital literacy, and alternatives to prohibition

In line with previous research on the psychosocial and structural risks associated with *loot boxes* (Xiao, 2021), a significant part of the scientific, political, and media discourse has tended to place prohibition as the primary response. However, comparative evidence suggests that exclusively restrictive measures may be insufficient in the face of global technological dynamics and transnational economic models. In this regard, King and Delfabbro (2019) warn that the video game industry's rapid adaptation to regulatory changes limits the effectiveness of isolated prohibitions, while Wardle and Zendle (2021) stress the need

for complementary preventive approaches capable of addressing the social and cultural factors that shape players' behaviour.

In this context, and from psychosocial perspectives critical of dominant health paradigms, the literature has highlighted the relevance of harm reduction approaches, defined as a pragmatic orientation focused on reducing the adverse effects associated with risk practices (Rhodes, 2009), to which Marlatt (1996) added the capacity to reconcile public health, individual rights, and social realism. These approaches start from the premise that certain potentially problematic behaviours do not disappear through prohibition, making it more effective to minimise their negative consequences through information, education, and community support.

Transposing this framework to the digital environment makes it possible to interpret *loot boxes* not only as a legal or health problem, but also as a phenomenon open to intervention through knowledge, information, risk-reduction strategies, and user autonomy, in line with approaches aimed at reducing the harms associated with digital chance-based mechanics and their relationship with problem gambling behaviours (Aonso et al., 2025). This perspective is presented as an alternative or complement to prohibitionist strategies, especially in light of the expansion of gambling and its digital forms in online environments (Abbott, 2020), given that digitalization increases risk factors such as availability, accessibility, and the personalization of supply, raising new challenges for prevention in digital contexts (Marionneau et al., 2023). Critical digital literacy constitutes one of the fundamental pillars of this approach. Livingstone and Helsper (2008) demonstrated that the development of digital skills among minors reduces vulnerability to online risks by fostering understanding of technological systems and informed decision-making. Applied to *loot boxes*, this means equipping players to interpret probabilities, recognise variable reinforcement mechanisms, and evaluate the economic impact of repeated spending. In this line, Wardle and Zendle (2021) point out that transparency and regulation of the digital environment shape users' perceptions of protection and trust. Complementarily, Xiao et al. (2023) show that the clear presentation of probabilities and real costs can reduce impulsive consumption decisions and improve perceptions of fairness of the system, reinforcing the relevance of educational interventions as a complement to exclusively punitive responses.

Along these same lines of intervention, the Spanish context offers an important reference point in the experience of Energy Control (EC), a pioneering programme in the implementation of information services, substance analysis, and health education in recreational settings (Fernández et al., 2024). Although its work has historically focused on drug use, its model, grounded in scientific evidence, community participation, and non-moralizing communication, has been internationally recognized as an example of good practice in harm reduction within European drug-checking services (Brunt et al., 2017). The logic underpinning these interventions is transferable to the digital environment of video games insofar as it prioritises access to understandable information, the promotion of autonomous decision-making, and the minimization of negative consequences without relying exclusively on prohibition. This perspective aligns with the conception of Energy Control as a program aimed at use not necessarily framed as problematic in

leisure settings, oriented more toward managing their effects than toward eliminating them (Fernández et al., 2022).

From this perspective, applying principles of digital harm reduction would make it possible to design public policies aimed at minimising the risks associated with *loot boxes* through measures such as mandatory probability transparency, configurable spending limits, accessible warning messages, or educational programmes directed at minors and families. These strategies have been proposed in the academic literature and in comparative regulatory frameworks as consumer-protection mechanisms against random reward systems in video games (King & Delfabbro, 2019; Xiao, 2021), and they align with contemporary public-health approaches to gambling that seek to balance harm prevention with individual freedoms and technological innovation, moving beyond simplistic dichotomies between free market and total prohibition (Abbott, 2020).

In addition, the incorporation of community organizations and participatory approaches, following experiences such as EC, may facilitate interventions that are closer to users' real practices, reducing the usual distance between institutional regulation and everyday digital culture. Couldry and Mejias (2019) warn that contemporary digital environments tend to make invisible the power relations that structure value extraction, which means that educational strategies should also be aimed at developing critical awareness of the economic functioning of platforms. In the same vein, Zuboff (2019) emphasises that effective protection against extractive dynamics requires not only legal regulation, but also an informed citizenry capable of understanding and questioning business models based on behavioural capture.

For all these reasons, we argue that the combination of digital literacy, informational transparency, and harm reduction strategies constitutes a plausible route for reducing the risks associated with the use of *loot boxes* without necessarily resorting to prohibition. This approach shifts the debate away from an exclusively restrictive logic toward interventions oriented to the protection of users and to the transformation of the regulatory conditions of the digital environment, whose effectiveness will depend on the normative context and the concrete implementation of these measures.

Discussion

The analysis developed throughout this article makes it possible to place *loot boxes* at the intersection of three closely connected dimensions: the economic transformation of video games within the framework of digital capitalism, the empirical evidence concerning their psychosocial risks, and the set of regulatory and socio-educational responses aimed at protecting users (Nieborg & Poell, 2018; King & Delfabbro, 2019). Considered together, these dimensions show that *loot boxes* are not merely a playful design mechanic, but an economic and cultural device embedded in broader structural dynamics of the contemporary digital ecosystem.

From the perspective of the political economy of platforms, digital business models profit by capturing data and prolonged monetization of user interaction (Srnicek, 2017). In the video game industry, this logic materialises in recurrent microtransaction systems that shift value from the cultural product to the continued

exploitation of the player-platform relationship, a process conceptualized as cultural platforming (Nieborg & Poell, 2018). In this context, *loot boxes* operate as mechanisms of sustained value extraction supported by psychological principles of variable reinforcement (King & Delfabbro, 2018), which helps explain their rapid expansion even in the absence of stable regulatory consensus.

The available research shows consistent associations between spending on *loot boxes* and problem gambling. The relationship initially identified by Zendle and Cairns (2018) has been replicated in different contexts and independent samples (Drummond et al., 2020). Although direct causality remains under debate, the convergence of findings points to shared risk factors (impulsivity, sensation seeking, or sensitivity to variable reinforcement) already identified in the literature (King & Delfabbro, 2018). This convergence is particularly relevant among minors, where early exposure to gambling-like mechanics may contribute to the normalization of betting practices and to later trajectories of vulnerability (Wardle & Zendle, 2021).

Even so, an exclusively clinical reading is insufficient to capture the complexity of the phenomenon. The convergence between video games and gambling is part of broader processes of hybridization of digital leisure (Griffiths, 2019), while perceptions of unfairness in monetization systems affect both psychological well-being and the cultural legitimacy of video games themselves (Petrovskaya & Zendle, 2022). From a psychosocial and critical political-economy perspective, these dynamics must be understood as expressions of capitalism oriented toward the continuous extraction of value (Couldry & Mejias, 2019), embedded in economic models based on the systematic capture of human behaviour (Zuboff, 2019). In this sense, the risks associated with *loot boxes* cannot be attributed solely to individual vulnerabilities, but also to digital environments designed to maximise attention, permanence, and spending within the current hegemonic logic.

In this scenario, exclusively prohibitionist responses show clear limitations. The adaptive capacity of the digital industry reduces the effectiveness of isolated restrictive regulations (King & Delfabbro, 2019), while public health has underlined the usefulness of harm reduction approaches in relation to behaviours that do not disappear through prohibition (Abbott, 2020; Marionneau et al., 2023). Conceived as a pragmatic model aimed at minimising negative consequences (Rhodes, 2009) and compatible with individual autonomy and community prevention (Marlatt, 1996), harm reduction makes it possible to reframe the debate on *loot boxes* in terms of informed protection rather than mere normative suppression.

Within this framework, critical digital literacy emerges as a central strategy. The development of competencies that allow people to understand technological systems and make informed decisions reduces vulnerability to online risks (Livingstone & Helsper, 2008). At the same time, experimental evidence shows that the probabilistic structure of rewards and the way they are presented influence economic decisions and willingness to spend (Cordes et al., 2024; Xiao et al., 2023), while rare rewards increase arousal and the urge to continue consuming (Larche et al., 2021). Community-based experiences grounded in rigorous information, social participation, and non-moralising communication, such as those developed by Energy Control in the field of harm reduction related to substance use, show the effectiveness of models that can

be transferred to the digital environment of video games (Brunt et al., 2017; Fernández et al., 2022; Fernández et al., 2024). In line with this, various regulatory proposals have suggested measures such as mandatory probability disclosure, configurable spending limits, understandable warnings, or educational programmes for minors and families (King & Delfabbro, 2019; Xiao, 2021).

This study has some limitations derived from its own methodological design. As it is a critical literature review, its conclusions depend on the current state of available research and do not incorporate original empirical data. Nevertheless, this approach allows to integrate findings from different disciplinary fields and to offer a synthetic interpretation of a phenomenon whose evidence is dispersed across the scientific literature. Future empirical research, both quantitative and qualitative, may further explore the psychosocial and economic dynamics associated with *loot boxes*.

Conclusions

The main contribution of this article lies precisely in articulating an integrated reading that links the political economy of digital capitalism, research on psychosocial risks, and socio-educational harm-reduction strategies, thereby overcoming the fragmentation that has characterised much of the previous research on *loot boxes*. Therefore, the analysis developed in this work suggests that understanding this phenomenon calls for an end to simplistic dichotomies between entertainment and dependency, free market and prohibition, individual responsibility and state regulation, and instead situating it as a hybrid process at the intersection of digital entertainment, behavioural economics, and psychosocial risk. From this perspective, *loot boxes* should be interpreted as a specific manifestation of structural transformations within digital capitalism that demand multidimensional responses capable of integrating regulation, education, transparency, and harm reduction. Such an integral approach would make it possible to move toward a balance between technological innovation, economic sustainability, and the protection of digital well-being. In this sense, the analytical trajectory developed here makes it possible to situate *loot boxes* as a phenomenon that exceeds their strictly technical consideration within video game design and that must be understood in relation to broader structural transformations of the contemporary digital ecosystem. Their expansion is linked to changes in the monetization models of interactive leisure, where prolonged interaction with users, the generation of recurrent income, and the incorporation of random reward systems profoundly reconfigure the economic and cultural logic of video games.

The evidence reviewed shows that these mechanics are associated with gambling-related risk behaviours, particularly in contexts of early exposure and insufficient protective mechanisms. Nevertheless, the phenomenon cannot be reduced to individual vulnerability or to exclusively clinical interpretations; rather, it must be situated within digital environments designed to encourage continued engagement, repeated spending, and the progressive normalization of uncertain reward dynamics. This structural perspective makes it possible to understand *loot boxes* as part of interdependent economic, psychological, and sociocultural configurations that organise the contemporary experience of digital leisure.

Likewise, the analysis highlights the limitations of responses focused solely on prohibition. In contrast to isolated restrictive approaches, the articulation of education, informational transparency, and harm-reduction strategies appears to be a more coherent route considering the complexity of the phenomenon and the transnational nature of digital environments. In this sense, strengthening users' critical capacities and promoting informed decision-making emerge as necessary conditions for balancing technological innovation, economic sustainability, and the effective protection of well-being.

The complexity of the *loot box* phenomenon underscores the limitations of approaches that address these mechanics through simplified or exclusively regulatory frameworks. Rather than one-dimensional responses, their analysis requires jointly considering issues such as the design of monetization systems, contexts of use, and the sociocultural conditions in which they are embedded. In this sense, articulating regulatory measures with digital literacy and prevention strategies may contribute to a better understanding of contemporary dynamics of video game monetization and their implications for the configuration of digital leisure practices.

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