

How ethical are loot box mechanics in modern video games, considering their similarities to gambling and potential effects on vulnerable players?

LITERATURE REVIEW

GDEV70011 PROJECT MANAGEMENT AND RESEARCH
METHODS

By Jack Slaski

Contents

1. Introduction	2
2. Literature Review	3
2.1 Loot Boxes In Games.....	3
2.2 Loot Box and Gambling Similarities	3
2.3 Loot Box Impact on Younger / Vulnerable Audiences	4
2.4 Current Loot Box and Gambling Laws	5
2.5 Ethical Concerns and Regulatory Response.....	6
3. Conclusion and Limitations.....	6
4. Reflection	7
How has your research process changed since the beginning?	7
Look back at your forum threads: which was the most influential article you found and why?	7
What would you do differently if you were to do this activity again?	7
How did you use AI tools and what were they useful for, and not so useful for?	8
5. References	8

1. Introduction

Recently, monetisation in video games has grown significantly with the presence of microtransactions, randomised reward systems, and loot boxes (King & Delfabbro, 2018). Although prevalent, loot boxes are becoming one of the most discussed, and controversial mechanics in recent game design due to ethical concerns. Loot boxes typically require players to spend real or in-game money in exchange for randomised in game rewards, including both cosmetic items, and items that can give players an advantage in gameplay. Whilst these systems are widely used in both mobile and console games, their rapid rise has called for debate across both academic and regulatory spaces within the games industry.

A key idea that is central to this debate is the idea of how closely loot boxes in games resemble gambling. Several academics argue that loot boxes share both structural and psychological similarities with gambling activities, in particular, the idea of staking money for an uncertain outcome (Griffiths, 2018). Multiple evidence-based studies have also identified statistically significant similarities between loot box spending and problem gambling severity (Zendle & Cairns, 2018; Zendle et al., 2020). These findings have raised ethical concerns within the industry, especially because loot boxes are very accessible to younger audiences and individuals that are vulnerable to gambling-related problems and harm.

Alternatively, some academics caution against classifying loot boxes as inherently harmful without enough direct evidence. This emphasises the need for more direct evidence rather than speculation, and because of this, some academics believe that people should not overreact or panic about it just yet (Etchells, 2021). However, there has been some response to the growing concern around loot boxes. Most notably, China have introduced regulations that require probability for loot box rewards (Xiao et al., 2021), highlighting the fact that the current legal landscape surrounding these mechanics is changing. Although regulations have been passed, the ability of these regulations to drive meaningful change is also debated.

This literature review will critically examine the ethical implications of loot box mechanics in modern day video games. It will explore the definition of loot boxes to understand and compare their similarities to gambling and their potential to cause possible harm to younger and vulnerable players. Furthermore, it will discuss and review the regulatory responses made, and ability to drive meaningful change, and if new regulations may be required. Through examining existing academic research surrounding loot boxes, this paper will evaluate whether current evidence supports the idea that loot boxes are an ethically problematic monetisation system.

2. Literature Review

2.1 Loot Boxes In Games

Loot boxes typically come in different formats, such as packs, crates, cases, boxes, chests, and bundles. Generally, they are described as “packs” or “boxes” that can be opened to reveal a randomised reward (Etchells, 2021). The mechanics of loot boxes are often considered similar to gambling as it involves paying for an unknown item at the point of purchase. Griffiths (2018) states that loot boxes encourage players to spend more money in the hope of winning rare items due to the odds for something good usually being minimal. Both academic and non-academic sources agree that randomness and monetary spending are the two core, defining features of loot boxes in games.

Loot boxes are generally common in games where microtransactions are frequent, with them being especially common in free games or live service games. In these games, the base game is usually free or sold at a lower up front price, with the majority of the revenue generated through the optional in-game purchases. King and Delfabbro (2018) state that "Game monetization schemes have become increasingly sophisticated and have been featured more prominently within popular online games". This suggests that systems such as loot boxes do not tend to function as mechanics on their own, but instead as part of a wider monetisation structure or strategy within games that intends to encourage repeated player spending.

One important factor of loot boxes is that they can vary in their impact within games. Some loot boxes give purely cosmetic rewards that do not effect gameplay performance. Other loot boxes offer items that could give a player a competitive advantage, usually known as a "pay-to-win" strategy, item, or mechanic. This difference is fairly frequently highlighted in debates surrounding this topic, as cosmetic loot boxes are usually seen as less ethically problematic than the ones that influence in game progression and performance (Neely, 2018). However, Zendle et al. (2020) argue that even loot boxes that don't directly give players a gameplay advantage can still remain linked to problem gambling through the act of paying for randomised rewards, suggesting that the ethical concerns of loot boxes may not just be relevant to ones with "pay-to-win" elements.

2.2 Loot Box and Gambling Similarities

Across the sources studied, there appears to be strong agreement that loot boxes share both structural, ethical, and psychological similarities to gambling. Griffiths (2018) argues that loot boxes meet the core criteria for gambling as players stake either money, or items with monetary value for a randomised outcome. Von Meduna et al. (2020) similarly defines gambling as "risking money or something of value on the outcome of an event involving an element of chance when the probability of winning is less than certain", suggesting that the mechanics of a loot box closely resembles gambling. Zendle and Cairns (2018) further support this by providing evidence showing a statistical link between loot box spending and problem gambling severity, suggesting that that mechanics of loot boxes may influence or even exploit risky behaviour. On the other hand, Etchells (2021) agrees with and acknowledges some of these concerns, but suggests approaching with caution in order to avoid discussions around loot boxes creating "moral panic". He argues that more long-term and robust research needs to be conducted before making definitive claims.

Several researchers have emphasised the idea that loot boxes use similar psychological tricks to those seen in gambling. Drummond and Sauer (2018) argue that loot boxes are psychologically akin to gambling, as they involve staking money for a randomised outcome of uncertain value. Furthermore, audiovisual design elements that are commonly seen in loot box openings, such as bright colours and animations or effects that build suspense, are also found in gambling and casino style games, helping to further strengthen the idea that the two share multiple similarities.

Some observational studies have been conducted to test more than just theoretical similarities and instead test and examine real measurable behavioural outcomes. Multiple large-scale studies have reported statistically significant similarities between lot box spending and problem gambling severity scores (Zendle & Cairns, 2018; Zendle et al., 2020). Zendle et al. (2020) found that this relationship was constant regardless of specific design features like cash-out or pay-to-win mechanics. This could indicate that the randomised, monetised reward structure of loot boxes on its own is associated with gambling-related risk. However, these findings are mainly based on self-reported data that was collected once, rather than over time, meaning that although the data appears to be related, it cannot be proven that one directly caused the other. This limitation has led to ongoing debates

within the literature about the strength of this comparison. Whilst some academics believe that the statistical similarities are evidence that loot boxes may lead to or contribute to gambling related harm, others argue that those who already have gambling vulnerabilities may just be more likely to engage in loot box purchasing. However, the repeated findings of similar structures, reward patterns, mechanisms, and strong links with problem gambling does suggest that loot boxes share important characteristics with traditional forms of gambling.

2.3 Loot Box Impact on Younger / Vulnerable Audiences

A major concern that is seen consistently within literature surrounding loot boxes in games is their impact on younger players and individuals that are considered vulnerable to gambling related harm, as well as the depth of this impact, and its extent in causing possible future gambling related psychological issues. Loot boxes are frequently seen in games that are accessible to children and younger audiences, particularly on mobile platforms, raising multiple ethical concerns regarding early exposure to gambling, or gambling-like mechanics. Evidence provided by Zendle et al., (2020) showed that loot boxes are highly prevalent in games that are rated suitable for younger audiences, increasing the chances that a minor will be exposed to, and possibly engage with, gambling-like systems before the age of 18. For example, FC26 (Electronic Arts, 2025) includes a wide range of monetisation features within the game, especially within the "Ultimate Team" gamemode. In this mode, players can open card packs containing randomised player rewards with frequent seasonal and time limited events appearing throughout. This game franchise has historically been rated a PEGI 3 in Europe, indicating that it is suitable for children. This shows how gambling-like monetisation systems may be found in games that are marketed as appropriate for younger audiences.

Several studies show a link between loot box engagement and indicators of problem gambling behaviours, with younger audiences appearing to be especially at risk. Consistent links between loot box spending and problem gambling severity are often reported, including those under the age of 18, which suggests that having an early exposure to these mechanics may normalise gambling-like behaviours, and even reinforce, or reward, harmful spending habits and patterns (Zendle et al, 2020). These findings raise concerns that early exposure to monetised random reward systems could lead to the normalisation of gambling behaviours, especially when those under the age of eighteen are able to easily access them.

In terms of an ethical perspective, King and Delfabbro (2018) state that loot boxes are a part of an even broader category of "predatory monetisation practices". The authors argue that these types of systems exploit psychological vulnerabilities, especially in young players and those that struggle with self-regulation. There are multiple game mechanics such as limited time offers, daily login rewards, or reward schedules that are highlighted as particularly problematic when younger audiences or audiences with a reduced capacity for informed decision making are exposed to them. These design strategies are commonly known for blurring the boundary between what is classed as entertainment and good game design, or exploitation. This raises clear ethical concerns about developers' roles in providing consumer protection.

Recent research surrounding loot boxes in games has indicated that the mechanics associated with loot boxes can have negative mental health effects on vulnerable players. Data from large-scale surveys has indicated that those who purchase loot boxes in games see higher levels of psychological distress compared to those who don't, with more severe cases of distress being present among heavy spenders (Drummond et al., 2022). From the findings discussed in this paper, it is clear that loot boxes may contribute to psychological harm among those determined to be in an at-risk group.

This strengthens the argument that calls for much stricter regulations and improved age related protection, as well as much clearer transparency of loot box systems within games.

2.4 Current Loot Box and Gambling Laws

Loot boxes are currently a very heavily debated topic, not just in the industry, but also in terms of laws and legislations. Recent changes in international legislation are further influencing how loot boxes are viewed and understood in games. For example, China recently introduced regulations requiring game companies to disclose the probabilities of each receivable reward in loot boxes, aiming to making these randomised systems and gambling similarities more transparent. According to Xiao et al (2021), research identifies China as the only country to legally require companies to disclose loot box reward probabilities, making it a key research point in the global discussions of loot box transparency and the protection of players. This policy has led to many global games displaying drop rates even outside of China. These laws are clear proof of regulations and actions beginning to take place, helping to acknowledge the gambling-like nature of loot boxes and take early steps to limit the potential of future exploitation.

However, probability disclosure alone does not appear sufficient to address all ethical concerns. Xiao et al. (2021) found that although Chinese law requires probability transparency, implementation is often inconsistent and presented in ways that can be difficult for players to understand. Furthermore, disclosure does not alter the structure of paying for randomised rewards, meaning that the harmful mechanics seen in loot boxes are still present. Other countries have taken different approaches. For example, Belgium has classified certain paid loot boxes as illegal gambling as they meet the legal definition of a game of chance under the Belgian Gaming and Betting Act, leading to some systems being removed from games in the country (Gamingcommission.be, 2018). In contrast, the United Kingdom Gambling Commission have maintained the idea that loot boxes fall outside of the Gambling Act 2005 as in-game items can't be exchanged for money or money's worth (Woodhouse, 2023). This variation of regulatory response shows the lack of international agreement on whether loot boxes are gambling and further supports the wider disagreements about consumer protection, monetisation design in games, and the appropriate time for legal intervention.

2.5 Ethical Concerns and Regulatory Response

With everything discussed so far, it is clear that there are many ways in which loot boxes resemble gambling. Because of this, how they are ethically treated and governed in practice, should also be discussed. Neely (2021) argues that "any scheme that treats players simply as a means of generating money will be unethical", reinforcing the idea that developers should respect a player's autonomy rather than designing systems to maximise revenue. This further strengthens the argument that ethical evaluation must consider the intent and implementation of loot boxes and monetisation rather than just the mechanical similarities.

Ultimately, the ethical debate around loot boxes is not just a question of legality. Although some regulations have helped to improve their transparency, the persistence of gambling-like mechanics and systems, behavioural reinforcement mechanisms, and measurable links with psychological distress all still raise concerns. If loot box systems resemble gambling and are accessible to vulnerable groups, then ethical evaluation must also consider the responsibility of developers to minimise any potential harm. This tension between monetisation, consumer protection, and the continued growth of games, is key to determine how ethical loot boxes really are.

3. Conclusion and Limitations

In conclusion, this literature review has examined the ethical implications of loot box mechanics in modern video games, especially regarding their structural similarities to gambling and their potential impact on vulnerable players. Across the literature, there is consistent evidence that loot boxes share multiple similarities to gambling, including one of the core ideas of staking money for uncertain outcomes. Furthermore, evidence-based research has shown statistically significant similarities between loot box spending and problem gambling severity, whilst wider studies have suggested that these systems may be linked to psychological distress among heavy purchasers. Overall, this evidence supports the argument that loot boxes present a genuine and credible ethical concern, particularly when accessible to those under the age of eighteen and individuals that are vulnerable to gambling-related harm.

However, there are many significant limitations that still exist within this literature review. Firstly, a lot of the existing research done is self-reported data, which presents concerns regarding data legitimacy and establishes more possible similarities, but not the exact cause. Furthermore, it is also unclear whether loot boxes directly lead to or contribute to gambling problems, if those already experience gambling difficulties are more likely to engage in loot boxes, or if another variable influences both behaviours. Finally, regulatory responses also largely vary in different jurisdictions, proving the ongoing disagreement about loot box and gambling classification.

Future research could build upon the findings of this review through an analysis of modern games with loot box mechanics. This would include identifying a range of different games across different platforms and age ratings and then examining how loot boxes are designed, presented, and integrated into gameplay. Probability disclosure practices, spending limits, reward structures, and psychological design mechanisms will also be examined in order to have a more detailed analysis. By analysing these systems in practice, rather than relying on self-reported data, a clearer understanding of how ethical concerns appear in actual game design can be gained.

4. Reflection

How has your research process changed since the beginning?

At the start of this project, my research process was quite generalised and exploratory. At first, I wanted to explore existing literature and discussion around the topic of loot boxes and gambling in games. I started off by using search terms such as “loot boxes in games” or “loot box gambling” in google scholar and research rabbit in order to understand the literature to help to build my project and choose my themes. Once I had outlined my themes, I started to refine my search terms to be more theme specific, looking into vulnerable audiences, regulation, and ethical discussion. I also became a lot more selective with my sources, prioritising more trusted sources that were at the forefront of the discussion with useful data. Furthermore, I also started to delve into legal and regulatory documents for facts to further strengthen my research. Over time, I changed from just identifying and skimming articles to finding highly relevant papers that linked directly to my research question.

Look back at your forum threads: which was the most influential article you found and why?

I believe that the most influential article was Zende and Cairns (2018), “Video game loot boxes are linked to problem gambling: Results of a large-scale survey”. This paper really stands out as it

provided clear data that showed a statistically significant link between loot box spending and problem gambling severity. Up until finding that article, most of my evidence was more theoretical or opinion based. This study gave clear and measurable data to support the gambling comparison, with loot boxes causing possible gambling related harms, and the direction of my literature review. This article provided the core of my “golden thread” argument by giving evidence to support the ethical and regulatory concerns.

What would you do differently if you were to do this activity again?

If I were to do this activity again, I would try and start with a much clearer structure from the go. During this project, especially in the early stages, there were multiple times where my themes, research question, and research focus changed as I was not fully set on the exact route I wanted to go down. Sorting this idea much earlier would have made this much easier. In a similar vein, I wish I had looked into the topic much earlier on, although I did do this, it would have been much more beneficial to have done this more, and earlier. Finally, I would also like to dive deeper into the international regulations of loot boxes and gambling classification, doing this earlier would have given a more solid foundation for this project rather than adding it later on.

How did you use AI tools and what were they useful for, and not so useful for?

In terms of AI usage, I used tools like Research Rabbit to find research articles and related papers. However, Google Scholar and Mendeley were still my preferred search engines. I did also use AI to help plan the initial structure of my theme titles for my literature review. However, after doing this once, it was not needed again. All in all, AI was fairly useful for finding references and organisation, but it was still not my preferred method for doing a lot of things as other more manual tools gave better and more useful results.

5. References

Drummond, A., Hall, L. C., & Sauer, J. D. (2022). Surprisingly high prevalence rates of severe psychological distress among consumers who purchase loot boxes in video games. *Scientific Reports*, 12(1). <https://doi.org/10.1038/s41598-022-20549-1>

Drummond, A., & Sauer, J. D. (2018). Video game loot boxes are psychologically akin to gambling. In *Nature Human Behaviour* (Vol. 2, Issue 8). <https://doi.org/10.1038/s41562-018-0360-1>

EA Vancouver, EA Romania (2025) EA Sports FC 26 [Video Game]. Electronic Arts. Available at: <https://www.ea.com/en/games/ea-sports-fc/fc-26> [Accessed 16 February 2026]

Etchells, P., 2021. Why we need to stop loot boxes from becoming another moral panic. *Science Focus*. Available at: <https://www.sciencefocus.com/comment/why-we-need-to-stop-loot-boxes-from-becoming-another-moral-panic> [Accessed 14 November 2025].

Gamingcommission.be. (2018). What are loot boxes? | Gaming Commission. [online] Available at: <https://www.gamingcommission.be/en/faq/new-developments/what-are-loot-boxes> [Accessed 14 January 2026].

Griffiths, M. D. (2018). IS THE BUYING OF LOOT BOXES IN VIDEO GAMES A FORM OF GAMBLING OR GAMING? *Gaming Law Review*, 22(1), 52–54. <https://doi.org/10.1089/glr2.2018.2216>

King, D. L., & Delfabbro, P. H. (2018). Predatory monetization schemes in video games (e.g. 'loot boxes') and internet gaming disorder. In *Addiction* (Vol. 113, Issue 11).
<https://doi.org/10.1111/add.14286>

Neely, E. L. (2021). Come for the Game, Stay for the Cash Grab: The Ethics of Loot Boxes, Microtransactions, and Freemium Games. *Games and Culture*, 16(2).
<https://doi.org/10.1177/1555412019887658>

von Meduna, M., Steinmetz, F., Ante, L., Reynolds, J., & Fiedler, I. (2020). Loot boxes are gambling-like elements in video games with harmful potential: Results from a large-scale population survey. *Technology in Society*, 63. <https://doi.org/10.1016/j.techsoc.2020.101395>

Woodhouse, J. (2023). Loot boxes in video games. commonslibrary.parliament.uk. [online] Available at: <https://commonslibrary.parliament.uk/research-briefings/cbp-8498/>. [Accessed 14 January 2026].

Xiao, L. Y., College, J. B., Henderson, L. L., Yang, Y., & Newall, P. W. S. (2021). Gaming the system: legally-required loot box probability disclosures in video games in China are implemented sub-optimally.

Zendle, D., & Cairns, P. (2018). Video game loot boxes are linked to problem gambling: Results of a large-scale survey. *PLoS ONE*, 13(11). <https://doi.org/10.1371/journal.pone.0206767>

Zendle, D., Cairns, P., Barnett, H., & McCall, C. (2020). Paying for loot boxes is linked to problem gambling, regardless of specific features like cash-out and pay-to-win. *Computers in Human Behavior*, 102. <https://doi.org/10.1016/j.chb.2019.07.003>

Zendle, D., Meyer, R., Cairns, P., Waters, S., & Ballou, N. (2020). The prevalence of loot boxes in mobile and desktop games. *Addiction*, 115(9). <https://doi.org/10.1111/add.14973>