



Overcoming the Instrumentalization of Gamification?

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Abstract

Gamification in educational technology has elicited both excitement and skepticism among educators and researchers. While advocates tout its potential to engage learners and cultivate intrinsic motivation, critics highlight its theoretical complexities and potential pitfalls. This paper delves into the paradox of gamification; meaning that gamification promises dynamic learning and yet, at the same time, condenses learning to a deterministic feedback apparatus. The paper examines the instrumentalization within gamification and the prevalent reliance on cybernetic feedback loops in educational contexts. By critically scrutinizing three hypotheses characteristic of the systematic pursuit of gamification-operational effects, the paper argues that the uncritical adoption of gamification risks oversimplifying learning processes, diminishing intrinsic motivation, and undermining the organic complexity of educational environments. To address these challenges, I stipulate two approaches that educators and technologists might adopt to reach a more nuanced and reflexive merger of technology and learning, embracing principles of participatory design, and prioritizing ethical inquiry.

Keywords: Gamification; Educational technology; Instrumentalization; Cybernetic feedback; Learning; Complexity; Intrinsic motivation; Participatory design; Ethics; Critical inquiry

Introduction

This paper builds from Walther and Larsen [1,2], and it deals with the integration of gamification in educational technology, which has been met with both enthusiasm and skepticism. While proponents highlight its potential to enhance engagement and motivation, critics raise concerns about its reductionist tendencies and potential ethical repercussions. This paper aims to unpack the paradox of gamification by exploring its instrumentalization and the pervasive faith in cybernetic feedback loops within educational contexts. By critically examining these issues through a discussion (or 'debunking') of three integral gamification-

operational hypotheses and two reflexive approaches to better balance the implications of the former, we can begin to understand the complexities of gamification and its effects in teaching and learning. I begin with a scrutiny of three hypotheses tacitly woven into the fabric of gamification, and proceed with two approaches to gamification and its application to educational technology that might be better suited to avoid pitfalls of instrumentalization, blind faith in cybernetics, and one-dimensional ethics. As such, I believe this paper to be stipulative, in the sense that a currently existing term is given a new specific meaning for the purposes of

argument or discussion in each context, as well as being open for implementation and further theoretical progress.

The Instrumentalization of Gamification

Hypothesis 1: At its core, gamification seeks to apply game design elements to non-game contexts to enhance user engagement and motivation

This hypothesis is problematic even from the get-go, since the instrumentalization of gamification often leads to the reduction of complex learning processes into simplistic point-scoring systems and rewards. This reductionism overlooks the multifaceted nature of learning, which encompasses cognitive, affective, and social dimensions. By emphasizing extrinsic rewards, gamification risks overshadowing intrinsic motivation and diminishing the authentic pursuit of knowledge. Gamification has gained significant traction across various fields, aiming to leverage game design elements to enrich user engagement and motivation in non-game contexts. As Deterding et al. [3] assert, gamification involves “the use of game design elements in non-game contexts.” This concept has been widely adopted in education, business, healthcare, and other sectors to nurture desirable behaviors, increase productivity, and improve learning outcomes—even to the point where ‘gamification’ is merely a subset of a broader and encompassing applied behavioral psychology [4]. However, despite its potential benefits, the application of gamification can often result in what scholars in alluding to Neo-Marxist ideas [5,6] term as “instrumentalization,” where complex learning processes are reduced to simplistic mechanics of point-scoring and reward systems. Werbach and Hunter [7] discuss this phenomenon, highlighting how gamification can lead to the “exploitation of human psychological quirks” by focusing solely on external incentives rather than addressing deeper intrinsic motivations for engagement. This reductionist approach fails to acknowledge the multifaceted nature of learning, which encompasses recursive cognitive modes that are both dependent on rational, abstract thinking and sensuous, practical experience—Kant’s Vernunft and Verstand—not to mention the intricacy of socio-cultural dimensions. As Hamari and Koivisto [8] argue, “Gamification is sometimes criticized for oversimplifying human motivation and behavior.” Learning involves not only the acquisition of knowledge and skills but also emotional engagement, social interaction, and personal growth.

Moreover, by overemphasizing extrinsic rewards, gamification runs the risk of overshadowing intrinsic motivation—the inherent desire to engage in an activity for its own sake. Deci et al. [9] highlight the importance of intrinsic motivation, which is driven by factors such as autonomy, competence, and relatedness. When gamification rests too heavily on external rewards, it may undermine individuals’ intrinsic motivation to learn, crippling the authentic pursuit of knowledge.

To dive into the inherent claims of Hypothesis 1 further critically, we can look towards Graeme Kirkpatrick’s article “Luddefaction: Fracking of the Radical Imaginary” [10]. Here, Kirkpatrick explores the concept of “luddefaction” as a means of understanding

contemporary culture’s appropriation of radical ideas for commercial and mainstream purposes. He defines “luddefaction” as the negative underside of ludification. It is “the play of joyless, repetitious routines, which drain the creative resources of the player [...] an employment of the play principle that undermines our collective ability to imagine a better life” (ibid.). Drawing from his insights, we can further elucidate the complexities surrounding the integration of gamification in educational technology. The notion of luddefaction resonates with the instrumentalization of gamification within educational contexts. Gamification, originally conceived as a means of enhancing engagement and motivation through game-like elements, has been co-opted by educational institutions and technology companies for instrumental purposes. Much like how radical ideas are “fracked” for commercial gain, and similar to how trends in the historical Avantgarde have been domesticized in uniform popular culture, gamification has been “fracked” from its original intent of fostering intrinsic motivation and transformed into a tool for efficiency and control within educational systems.

Kirkpatrick’s critique of the reductionist tendencies inherent in luddefaction parallels the concerns raised by critics of gamification. The reduction of complex learning processes into quantifiable metrics and the reliance on cybernetic feedback loops oversimplify the educational experience, stripping it of its organic complexity and richness. Joyous and creative learning instead becomes “repetitious routines”. Just as radical ideas are watered down and sanitized for mass consumption, gamification risks reducing education to a series of Pavlovian responses, devoid of critical thinking and deep engagement. Kirkpatrick’s emphasis on the ethical implications of luddefaction aligns with the call for ethical inquiry in the integration of gamification. The uncritical adoption of gamification in educational technology raises ethical concerns about the commodification of learning (which I will deal with later), the manipulation of student behavior, and the reinforcement of power dynamics within educational institutions. Without careful consideration of these ethical dimensions, gamification runs the risk of perpetuating inequities and exacerbating educational inequalities.

To address these challenges, educators and technologists must heed Kirkpatrick’s call for a more reflexive approach to gamification. Rather than blindly embracing gamification as a panacea for educational woes, stakeholders must engage in critical inquiry and participatory design processes that prioritize the needs and agency of learners. By reframing gamification as a tool for empowerment rather than control, educators can harness its potential to cultivate intrinsic motivation and foster meaningful learning experiences. Such cultivation might also benefit from theoretical curiosity and the pursuit of Popperian falsification.

Thus, while gamification holds promise as a tool for enhancing user engagement and motivation, its instrumentalization can lead to oversimplification of learning processes and the neglect of intrinsic motivators. Educators, designers, and practitioners must carefully balance the use of game design elements with a holistic understanding of learning to create meaningful and sustainable gamified experiences.

The Faith in Cybernetic Feedback Loops

Hypothesis 2: The faith in cybernetic feedback loops perpetuates the belief that constant monitoring and adjustment can optimize learning outcomes

Drawing from cybernetic theory, gamified systems aim to maintain equilibrium through continuous feedback and adaptation. However, this mechanistic approach overlooks the dynamic and emergent nature of learning environments. Human cognition defies simple input-output models, as learners engage in nonlinear processes of sense-making and meaning construction. The reliance on cybernetic feedback can thus undermine the organic complexity of learning, reducing it to a series of predictable responses. The application of cybernetic principles in gamified systems reflects an undergirding assumption that constant monitoring and

adjustment can lead to optimized learning outcomes. This notion is rooted in cybernetics, a transdisciplinary approach that examines regulatory systems and feedback mechanisms in complex, dynamic environments. As Wiener [11], a pioneer in cybernetics, elucidates, “the cybernetic approach attempts to discern common principles underlying the functioning of systems that span physical, biological, cognitive, and social domains.”

Gamified systems leverage cybernetic feedback loops to regulate user behavior and maintain equilibrium (see Figure 1 below). By providing immediate feedback and adjusting game parameters based on user interactions, these systems aim to optimize engagement and facilitate learning. As Werbach and Hunter [7] observe, “Gamification uses feedback loops to maintain engagement over time by giving players a sense of progress and achievement.”

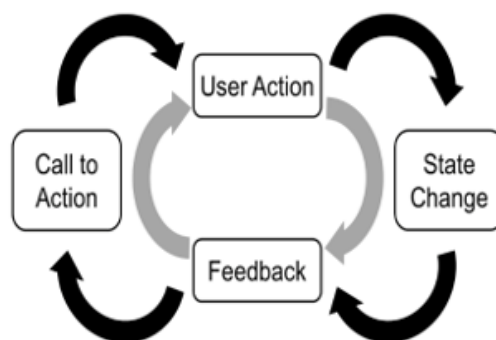


Figure 1: A prototypical action/feedback model.

However, this mechanistic view of learning overlooks the dynamic and emergent nature of learning environments. Human cognition is characterized by nonlinear processes of sense-making and meaning construction, which go beyond simple input-output models. As Luhmann [12], a prominent figure in sociological cybernetics, notes: “Human communication and learning involve recursive processes that continually reshape the boundaries and structures of the system.” The reliance on cybernetic feedback in gamified systems risks reducing learning to a series of predictable responses, neglecting the organic complexity of the learning process. As Hamari et al. [13] caution, “gamification may lead to oversimplification of human behavior and cognition by treating them as predictable and controllable.” This reductionist approach undermines the richness and “diversity of learners’ experiences, constraining their exploration and creativity”. Moreover, the emphasis on constant monitoring and adjustment in gamified systems can foster a culture of surveillance and control, stifling autonomy, and intrinsic motivation. As Foucault [14] argues, “The panopticon, a metaphor for surveillance and disciplinary power, operates on the principle of constant visibility and monitoring.” In the context of gamification, this constant scrutiny may inhibit

learners’ freedom to explore and experiment, constraining their engagement and inhibiting their learning potential.

In conclusion of this section and the claims of the second gamification-operational hypothesis, while cybernetic feedback loops offer a means to regulate user behavior and optimize engagement in gamified systems, they risk oversimplifying the dynamic and emergent nature of learning environments. By viewing learning as a series of predictable responses, gamification undermines the organic complexity of the learning process and stifles learners’ autonomy and intrinsic motivation. Educators and designers must therefore balance the use of cybernetic feedback with a nuanced understanding of human cognition and learning to create meaningful and enriching learning experiences.

Ethical Implications

Hypothesis 3: Using operational gamification hypotheses to build effective and entertaining educational designs is also a catering for ethically sound solutions

This hypothesis posits that the utilization of operational gamification hypotheses within educational designs can facilitate

the development of effective and engaging learning experiences while upholding ethical standards. The discussion surrounding this hypothesis revolves around the critical examination of the ethical dimensions of gamification in education, highlighting both its potential benefits and risks.

Gamification, the integration of game elements into non-game contexts, has gained popularity in educational settings due to its potential to strengthen engagement and motivation among learners. However, the uncritical adoption of gamification without considering its ethical implications can lead to unintended consequences. As noted by Deterding et al. [3], gamification can inadvertently reinforce competitive behavior and individualism, which may undermine collaborative learning environments. This assertion is supported by research suggesting that gamified educational platforms often prioritize individual achievement over collective progress [13]. Furthermore, gamified systems may exacerbate existing inequalities within educational settings. According to Sicart [15], gamification tends to favor certain learning styles and cultural norms over others, potentially marginalizing students who do not conform to these standards. For example, gamified learning platforms that heavily rely on competition may disadvantage students who thrive in cooperative learning environments. Additionally, the pursuit of efficiency and control through gamification can compromise the core values of education, such as equity and diversity. As noted by Gee [16], the gamification of education can lead to the standardization of learning experiences, overlooking the diverse needs and backgrounds of learners.

To cope with these ethical concerns, the integration of operational gamification hypotheses becomes crucial. Operational gamification hypotheses provide a framework for designing gamified educational experiences that prioritize ethical considerations and align with educational objectives. By grounding gamification practices in evidence-based principles, educators can ensure that gamified learning environments promote positive learning outcomes while minimizing potential harm. One approach to operationalizing gamification hypotheses involves incorporating elements of intrinsic motivation and autonomy support into educational designs. Deci and Ryan [17] argue that intrinsic motivation, characterized by a sense of autonomy, competence, and relatedness, fosters optimal learning experiences. Therefore, gamified educational designs should aim to cultivate intrinsic motivation by providing learners with meaningful choices, opportunities for mastery, and connections with peers.

Additionally, ethical gamification design should prioritize inclusivity and diversity to mitigate the risk of perpetuating inequalities. According to Bogost [18], ethical gamification involves considering the needs and perspectives of diverse learners and incorporating mechanisms for accommodating individual differences. This may include offering multiple pathways for progression, providing personalized feedback, and incorporating diverse cultural references and perspectives into game content. Moreover, ethical gamification design should promote critical inquiry and reflection among learners. As argued by Salen and

Zimmerman [19], games have the potential to encourage players to explore complex systems, solve problems, and critically evaluate information. Therefore, gamified educational experiences should incorporate opportunities for inquiry-based learning, where students are encouraged to ask questions, challenge assumptions, and engage in reflective discourse.

In conclusion, Hypothesis 3 underscores the importance of using operational gamification hypotheses to develop ethically sound educational designs. By integrating principles of intrinsic motivation, inclusivity, and critical inquiry into gamified learning environments, educators can harness the potential of gamification while safeguarding against its ethical pitfalls. Ultimately, ethical gamification design aims to create learning experiences that empower learners, foster collaboration, and uphold the fundamental values of education. Now, let's look at some new approaches that might avoid deterministic technology views and the one-sided confidence in cybernetic automation.

A Reflexive Approach to Gamification

First approach: To address the theoretical problems engrained in the three gamification-operational hypotheses dealt with above, educators and technologists must adopt a more nuanced, reflexive, and non-deterministic approach to gamification

As we have seen in the above, addressing the theoretical problems inherent in the operational hypotheses of gamification requires a nuanced and reflexive approach from educators and technologists. Rather than viewing gamification as a one-size-fits-all solution to educational challenges, it is imperative to critically examine its underlying assumptions and implications. This entails moving away from deterministic models of learning towards embracing uncertainty and complexity. Educators should strive to design learning experiences that prioritize autonomy, mastery, and purpose, thereby cultivating intrinsic motivation and fostering meaningful engagement among learners.

To begin with, it is essential to acknowledge the limitations of deterministic models of learning, which often underpin traditional approaches to education. These models tend to view learning as a linear process, with clear cause-and-effect relationships between instructional inputs and learning outcomes. However, such a reductionist perspective fails to capture the complexity of human cognition and behavior. As noted by Squire and Jenkins [20], learning is a multifaceted phenomenon shaped by a myriad of factors, including social, cultural, and contextual influences. Therefore, educators must adopt a more holistic understanding of learning that embraces uncertainty and acknowledges the diverse needs and perspectives of learners. Central to this shift in perspective is the recognition of the importance of autonomy, mastery, and purpose in constituting intrinsic motivation among learners. Deci and Ryan [21] argue that individuals are inherently motivated to engage in activities that fulfill their basic psychological needs for autonomy, competence, and relatedness. Therefore, educators should design learning experiences that afford learners a sense of autonomy, allowing them to make meaningful choices and take ownership of

their learning journey. This process of empowerment could involve incorporating elements of self-directed learning, where students have the flexibility to pursue topics of interest and explore learning pathways that align with their personal goals and aspirations.

Fostering mastery—the pursuit of continuous improvement and skill development—is crucial for sustaining intrinsic motivation. Csikszentmihalyi [22] describes the concept of flow, wherein individuals experience deep engagement and satisfaction when they are fully immersed in challenging yet attainable tasks. Therefore, educators should provide learners with opportunities to set meaningful goals, receive constructive feedback, and experience a sense of progression and achievement. This may involve designing learning activities that scaffold learning experiences [23], gradually increasing the level of challenge as students develop their skills and knowledge. Moreover, instilling a sense of purpose in learning can further enhance intrinsic motivation and engagement among learners. Pink [24] argues that individuals are motivated by a desire to contribute to something larger than themselves—a sense of purpose that transcends personal gain. Therefore, educators should connect learning experiences to real-world problems and issues, enabling students to see the relevance and significance of their learning beyond the confines of the classroom. This could involve engaging students in project-based learning initiatives, where they collaborate with peers to address authentic challenges and make meaningful contributions to their communities.

In addition to cultivating autonomy, mastery, and purpose, educators must also consider the ethical implications of gamification in educational settings. As discussed earlier, gamification has the potential to reinforce competition, privilege certain learning styles, and exacerbate inequalities. Therefore, it is essential to approach gamification with a critical lens, considering its impact on diverse learners and promoting inclusive design practices. Deterding et al. [3] advocate for a more nuanced understanding of gamification that considers the socio-cultural context in which it is implemented, as well as the values and beliefs of the individuals involved.

In conclusion of this section, tackling the theoretical problems fundamental to the operational hypotheses of gamification compels a nuanced approach that prioritizes autonomy, mastery, and purpose in learning design. By moving away from deterministic models of learning and embracing uncertainty and complexity, educators can create learning experiences that foster intrinsic motivation and meaningful engagement among learners. Moreover, by critically examining the assumptions and implications of gamification, educators can ensure that its implementation aligns with ethical principles and promotes inclusive practices. Ultimately, the goal is to harness the potential of gamification to enhance learning outcomes while safeguarding against its potential pitfalls.

A Participatory Design Approach to Gamification

Second approach: The integration of gamification should be informed by principles of participatory design and co-creation, involving learners as active collaborators in the design process. The second approach to integrating gamification in education

emphasizes the importance of participatory design and co-creation, wherein learners are actively involved as collaborators in the design process. This approach acknowledges the value of centering student voices and experiences to ensure that gamified systems are tailored to diverse learning needs and preferences. Additionally, educators are urged to remain vigilant against the commodification of education, resisting the inclination to reduce learning to quantifiable metrics and outcomes.

Participatory design, also known as co-design or co-creation, is a collaborative approach to designing products, services, or systems that involves end-users as active participants in the design process [25]. In the context of education, participatory design entails engaging students in the development of gamified learning experiences, soliciting their input, feedback, and ideas throughout the design process. By involving students as co-designers, educators can gain insights into their unique perspectives, preferences, and learning styles, thereby ensuring that gamified systems are tailored to meet their needs and interests. The importance of student involvement in the design process is underscored by research on learner-centered pedagogy. According to Vygotsky [26], learning is a social and collaborative process that occurs through interactions with others. Therefore, by actively involving students in the design of gamified learning experiences, educators can create opportunities for meaningful collaboration, dialogue, and co-construction of knowledge. This approach not only enhances student engagement and motivation but also promotes a sense of ownership and agency over the learning process.

Moreover, participatory design aligns with principles of student empowerment and agency, which are central to progressive educational theories. Freire [27] argues that education should be a process of critical inquiry and transformation, where students are active participants in their own learning and agents of social change. By involving students in the design of gamified learning experiences, educators can empower them to shape their educational experiences, express their creativity, and exercise agency over their learning journey. In addition to participatory design, educators must also be vigilant against the commodification of education, which occurs when educational practices and resources are treated as marketable commodities to be bought, sold, and traded [28]. The commodification of education is often driven by external pressures to demonstrate measurable outcomes and achieve standardized benchmarks, leading to the prioritization of quantifiable metrics over meaningful learning experiences.

One of the risks associated with the commodification of education is the reduction of learning to quantifiable outcomes, such as test scores, grades, and performance metrics. This narrow focus on measurable outcomes can undermine the intrinsic value of education, which encompasses a broader range of cognitive, affective, and social dimensions [29]. By resisting the temptation to reduce learning to quantifiable metrics, educators can create space for more holistic and authentic learning experiences that prioritize critical thinking, creativity, and personal growth. Furthermore, the commodification of education can perpetuate inequities and

inequalities by prioritizing the needs and interests of certain stakeholders over others. As noted by Giroux [28], market-driven educational reforms often exacerbate existing disparities by catering to the interests of affluent students and communities at the expense of marginalized groups. Therefore, educators must be mindful of the social and ethical implications of commodification and strive to create inclusive and equitable learning environments that empower all students to succeed.

The integration of gamification in education should thus be informed by principles of participatory design and co-creation, wherein learners are actively involved as collaborators in the design process. By centering student voices and experiences, educators can ensure that gamified systems are responsive to diverse learning needs and preferences. Additionally, educators must remain vigilant against the commodification of education, resisting the temptation to reduce learning to quantifiable metrics and outcomes. Instead, they should strive to create meaningful and inclusive learning experiences that empower students to engage critically with content, collaborate with their peers, and contribute positively to society.

Conclusion

The paradox of gamification underscores the need for critical reflection and ethical inquiry in educational technology. By

interrogating its instrumentalization and the uncritical faith in cybernetic feedback loops, as we saw in the discussion of the three hypotheses tailored to assist the gamification-operational system, educators can reclaim the transformative potential of technology in service of authentic learning and human flourishing—possibly by investing in the two approaches favoring non-determinism and co-creation (see Table 1 above). Moving forward, it is thus essential to prioritize principles of participatory design, foster intrinsic motivation, and uphold the ethical values of education in the integration of gamification. Moreover, it is also vital, I believe, to continue to disrupt the theoretical nucleus of ‘gamification’, in a way making it more vulnerable and honest as a supportive tool for technology design and learning ideologies. Only through a more sensitive approach—one perhaps laden with biases and falsification—can we harness the true potential of gamification to support meaningful and equitable learning experiences. A critical theory approach to the effect claims of gamification might also be regarded as a bulwark to the concern that the spillover of gamification technologies into the teacher and learning environment too easily becomes a struggle to immunize education from risks associated with negativity, i.e., ‘uncontrollable’ forces considered disorderly, disruptive, or even destructive [30]. To stretch things a bit, gamification is the easy bet in faithfulness to the prevailing ethico-political standards.

Table 1: Gamification hypotheses and approaches.

Gamification-operational Hypotheses ('inherent')	Gamification-critical Approaches ('derived')
H1: At its core, gamification seeks to apply game design elements to non-game contexts to enhance user engagement and motivation.	A1: Educators and technologists must adopt a more nuanced, reflexive, and non-deterministic approach to gamification.
H2: The faith in cybernetic feedback loops perpetuates the belief that constant monitoring and adjustment can optimize learning outcomes.	A2: The integration of gamification should be informed by principles of participatory design and co-creation, involving learners as active collaborators in the design process.
H3: Using operational gamification hypotheses to build effective and entertaining educational designs is also a catering for ethically sound solutions.	

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Conflict of Interest

No conflict of interest.

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