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RECEIVED 02 August 2024
ACCEPTED 04 November 2024
PUBLISHED 19 November 2024

CITATION
Jose B, Cherian J, Jaya PJ, Kuriakose L and
Leema PWR (2024) The ghost effect: how
gamification can hinder genuine learning.
Front. Educ. 9:1474733.
doi: 10.3389/educ.2024.1474733

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The ghost effect: how gamification can hinder genuine learning

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KEYWORDS

gamification, motivation, ghost student, adaptive strategies, inclusive learning

Introduction

Gamification has been widely celebrated as a perfect solution to fix the problem of students becoming less productive in their learning (Costello, 2020; Sailer and Homner, 2020; Sante Otero, 2020). Yet for all its good intentions, it may be serving to impede true learning. This highlights an important conundrum: the very nature of gamified learning in many ways, such as focusing on extrinsic rewards (e.g., scores, badges), risks encouraging surface-level understanding rather than deeper ones required for sustaining lifelong learning and transforming the learner to a better individual (Koppitsch and Meyer, 2022). A clear example of failure is the issue of “ghost students”—those who are there in class physically but aren’t paying attention. This shows that there are design challenges in figuring out the best way to handle this problem. This article explores whether gamification promotes sustained engagement, fosters collaborative learning, and enhances cognitive development, while examining its effects on intrinsic and extrinsic motivation.

Challenges of gamification

Extrinsic motivation and its dangers

One significant concern with gamification is its reliance on extrinsic motivations. Many of the strategies used to motivate students, such as awarding points or badges, serve as external rewards. However, this approach might detract from students’ intrinsic desire to learn for the sake of understanding. If extrinsic rewards become the primary motivator, as they often are in today’s classrooms, students might engage with the material superficially rather than immersing themselves deeply in it (Anselme and Hidi, 2024).

From an underlying concern, Ryan and Deci (2000) propose from the motivation theory of self-determination that rewards external to a person can reduce intrinsic motive. Hamari et al. (2014) also found that while gamified can engender perfunctory engagement in the undertaken activity, it does not moderate superficial motivational effects and produce lasting sustained interest or psychologically meaningful cognitive work. This seems to suggest that students cared more about the game aspects than they did anything else so were never truly getting a handle on what was being taught.

Balancing intrinsic and extrinsic motivations

Research suggests that when gamified elements are designed to complement intrinsic goals—such as mastering a skill, exploring personal interests, or engaging in meaningful challenges—they can help foster a deeper, more sustained interest in learning (Anselme and Hidi, 2024). For instance, using gamification to set personal goals, offer constructive feedback, and encourage self-paced progress can help students find personal relevance and joy in the material. This balance ensures that gamification doesn't merely motivate students through rewards but also aligns with their internal drives to learn, promoting both engagement and authentic understanding.

Psychological impacts

Clearly the other side of this coin—the emotional and psychological implications that gamification is being introduced into—deserve to be unpacked as well. While gamified environments have been shown to increase competitiveness and reduce stress for some, they can also introduce new stresses (Malak, 2024). Given that some students may be motivated by the rewards this scheme encourage, as its focus is on recording of good and bads with pending bonuses to reflect achievement-based nature. It might also demoralize others overlaying learning for a reward (Chen, 2023).

Another concern with gamification is that it can fuel the competitive nature of students resulting in a belief contrary to what we hoped for, as to them learning is just competing (Chen, 2023). It can be understandably damaging for individuals who lag behind while the pace quickens, resulting in lowered self-efficacy and decreased engagement which eventually results in academic dropout. The end result will be, gamification process can ultimately lead to the development of “ghost students” which is believed to be contrary to the proclaimed aim of gamification.

Inclusivity and adaptability

There are also concerns raised about the inclusivity of gamification. This may be too broad and not provide for the diverse learning styles/personality types in any classroom (Salman et al., 2024). For example, Buckley and Doyle (2017) discovered that while extraverted students seem to benefit from gamification. The other counterpart, the introvert, who is already not active in the classroom because of his personality, will feel the gamified classroom a pressure cooker. Thus, we should say, the one for all type gamified classes won't result in intended result. Again, the number of ghosts is on increase (Denden et al., 2024).

Long-term impacts

As a play-based learning method, gamification is by default more engaging than light self-direction or simple project/inquiry. Yet those are other routes... creative avenues which stimulate

reflection based on student questions and innate desire to understand. Gamification can even be a little bit of a red herring, taking the focus too far out toward extrinsic rewards like points or badges and away from the learning (Chen, 2023). This may cause students to speed through their assignments for the incentives, bulldozing past key concepts in a trend that is making its way into top-level academic environments as well due to gamification.

There is also worry that gamification could have long-term effects on the development of a student's cognitive skills (Sailer and Homner, 2020). This may lead students to be so used to gamified spaces that they struggle with content that does not provide instant gratification. This dependence on extrinsic motivators may in fact undermine the very skills of self-directed inquiry we are looking to cultivate, so important not just at university but also as a lifelong learner.

A balanced approach to gamification

Gamification has undeniably altered the face of education; however, we must begin to acknowledge its flaws. By the time this technology is in place, (hopefully) educators and policymakers will have to work together to make sure gamification doesn't ruin more than it solves. This can be achieved through a thoughtful approach toward intrinsic motivation and inclusivity (Anselme and Hidi, 2024).

Gamification has been widely celebrated as a perfect solution to fix the problem of students becoming less productive in their learning. Though this can be true to a certain extent, it is crucial that we clarify every engagement being synonymous with effective learning. There's a danger in overemphasizing rewards, as it encourages students to come away from the learning with something gained rather than understanding the material (Chen, 2023). This, in turn, may lead to citizens with utility-like qualities and minimal interest for society. Encouraging students to establish individual learning goals could help build intrinsic motivation for the learner, and educators can tie content delivery back directly or indirectly into those self-set learning objectives. Also, developing personalized systems that appeal to various learning styles will help all students participate meaningfully (Denden et al., 2024). It also applies to creating a learning culture where sharing and collaborating are appreciated, fostering inclusivity.

It is also important to monitor regularly how the application of gamification affects students, both emotionally and psychologically. Gamification empowers, but it is a tool that educators must be willing to tailor so that students are still well and good. In the years to come, education will ensure that gamification leads down a path where learning becomes personal and adaptable. Employing technologies, such as AI that can be customized to meet specific learning requirements (Denden et al., 2024), will help deliver the optimum mix of engagement and enhanced learning.

Adaptive and inclusive gamification strategies

To ensure that gamification benefits all learners, adaptive and inclusive strategies are essential. Personalized gamification systems can leverage AI and data analytics to tailor content

and challenges according to each student's unique learning pace, preferences, and strengths (Denden et al., 2024). For instance, AI-driven platforms can adjust the difficulty level of tasks in real-time, offer alternative pathways based on student interests, and provide timely, personalized feedback. By aligning gamified elements with individual learning styles, educators can create a more inclusive environment where all students—regardless of personality type or learning preference—can engage meaningfully. Such adaptive approaches not only foster a more equitable learning experience but also encourage sustained motivation and deeper engagement across diverse student groups.

Conclusion

Gamification has the potential to significantly enhance educational experiences, supporting diverse learning goals such as engagement, collaboration, and skill development. While our analysis highlights risks like surface-level engagement, stress, and inclusivity challenges, these can be mitigated with a thoughtful, adaptive approach. By incorporating personalized strategies that accommodate individual learning styles and motivations, educators can create gamified environments that go beyond extrinsic rewards to foster genuine interest, intrinsic motivation, and deeper learning.

For gamification to reach its full potential, regular assessments of student engagement and wellbeing are essential. A balanced, research-informed approach allows educational institutions to leverage gamification's strengths while nurturing essential cognitive and emotional competencies, ultimately building inclusive, sustainable learning environments for all students.

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BJ: Conceptualization, Investigation, Software, Writing – original draft, Writing – review & editing. JC: Conceptualization, Writing – review & editing. PJ: Conceptualization, Writing – review & editing. LK: Conceptualization, Writing – review & editing. PL: Conceptualization, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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