



Exploring gamified learning: student engagement and academic achievement perspectives

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Abstract

This qualitative study investigates the experiences and perceptions of undergraduate students within gamified learning environments. Utilizing a phenomenological approach, semi-structured interviews were conducted with 15 participants from diverse academic disciplines. Thematic analysis revealed that students generally perceived gamification positively, citing increased engagement and motivation as key benefits. Personalization options and clear goals were identified as significant factors influencing student engagement, while the impact of gamification on academic achievement varied among participants. Challenges such as technical issues and concerns about equity were also noted. These findings contribute to theoretical understandings of motivation and engagement in educational contexts and have practical implications for educators and policymakers seeking to optimize the effectiveness of gamified learning approaches in higher education. Further research is needed to explore the long-term effects of gamification on student outcomes and address associated challenges.

Keywords: Academic achievement; gamified learning environments; higher education; student engagement; qualitative study.

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1. INTRODUCTION

In recent years, the landscape of education has been increasingly influenced by advancements in technology, which have transformed traditional teaching and learning paradigms. One such technological innovation that has gained traction in educational settings is gamification (Mauri-Medrano et al., 2024). Gamification involves the integration of game elements, mechanics, and principles into non-game contexts, such as education (Deterding et al., 2011). The rationale behind gamification in education stems from the recognition of the potential to enhance student engagement, motivation, and learning outcomes by leveraging principles of game design (Abdul Ghani et al., 2022; Hamari et al., 2014; Kapp, 2012; Chen et al., 2023).

Traditional educational approaches often struggle to sustain students' interest and motivation, particularly in the face of modern distractions and competing interests. Gamified learning environments offer a solution by providing interactive, immersive, and enjoyable learning experiences that align with students' preferences and interests (Seaborn & Fels, 2015). By incorporating elements such as points, badges, leaderboards, and narratives, gamified learning platforms aim to tap into intrinsic motivation and foster a sense of autonomy, mastery, and relatedness among learners (Deci & Ryan, 1985; Nacke et al., 2018; Kam & Umar 2024). However, despite the growing enthusiasm for gamification in education, there remains a need for empirical research to investigate its effectiveness and implications for student learning.

Despite the increasing adoption of gamified learning environments, there is a dearth of qualitative research that delves into the nuanced experiences and perceptions of students engaging with these platforms. While quantitative studies have provided valuable insights into the quantitative effects of gamification on student performance and motivation, qualitative inquiry is essential for gaining a deeper understanding of the subjective aspects of gamified learning, such as student engagement, motivation, and learning processes (Johnson et al., 2016; Tondello et al., 2019; Khaldi et al., 2023). Therefore, the problem addressed by this research lies in the gap in the literature regarding the qualitative exploration of the impact of gamified learning environments on student engagement and achievement.

1.1. Purpose of study

The primary purpose of this qualitative research study is to investigate the impact of gamified learning environments on student engagement and achievement within educational settings. By conducting in-depth explorations of students' experiences, perceptions, and attitudes toward gamification in education, this study aims to uncover the underlying mechanisms and factors influencing student engagement and academic outcomes in gamified learning contexts. Additionally, the study seeks to identify the potential benefits and challenges associated with gamification, providing insights that can inform the design and implementation of effective gamified learning interventions.

This study holds significant implications for both theory and practice in the field of educational technology. The findings are expected to contribute to theoretical knowledge regarding the mechanisms underlying gamified learning and its impact on student engagement and achievement. Furthermore, the insights gained from this research can inform the development of evidence-based strategies for educators and instructional designers to effectively integrate gamification into their teaching practices. Ultimately, the study aims to advance our understanding of how gamified learning environments can be optimized to enhance student learning experiences and outcomes.

The following research questions will guide the inquiry:

- How do students perceive and experience gamified learning environments?
- What factors influence student engagement and motivation within gamified learning contexts?

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- What is the impact of gamification on students' academic achievement and learning outcomes?
- What are the challenges and limitations associated with the implementation of gamified learning environments?

1.2. Literature review

Gamified learning involves the integration of game design elements and mechanics into educational activities to enhance engagement, motivation, and learning outcomes (Deterding et al., 2011; Kapp, 2012). These elements may include points, badges, leaderboards, levels, narratives, and feedback systems, which are designed to create an immersive and enjoyable learning experience (Hamari et al., 2014; Seaborn & Fels, 2015). The principles of gamified learning draw from theories of motivation and engagement, aiming to tap into intrinsic motivators such as autonomy, competence, and relatedness to promote sustained engagement and learning (Deci & Ryan, 1985; Ryan & Deci, 2000).

Self-Determination Theory (SDT): SDT posits that individuals are intrinsically motivated to pursue activities that satisfy their psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 1985). In the context of gamified learning, autonomy is supported by providing learners with choices and control over their learning paths, while competence is fostered through meaningful challenges and opportunities for skill development. Relatedness is promoted through social interactions and collaboration within gamified environments (Nacke et al., 2018; Huang, 2024).

Flow Theory: Flow theory describes a state of optimal engagement and immersion experienced when individuals are fully absorbed in an activity characterized by clear goals, immediate feedback, and a balance between perceived challenges and skills (Csikszentmihalyi, 1990). Gamified learning environments aim to facilitate flow by providing learners with progressively challenging tasks, timely feedback, and opportunities for skill mastery, leading to a heightened sense of enjoyment and concentration (Seaborn & Fels, 2015; Nacke et al., 2018).

Previous research on gamified learning environments has explored various aspects of their effectiveness and impact on student engagement, motivation, and learning outcomes. Studies have examined the influence of specific game elements (badges, leaderboards) on motivation and performance (Hamari et al., 2016; Nacke et al., 2018), as well as the role of intrinsic and extrinsic motivators in driving engagement (Johnson et al., 2016). Additionally, research has investigated the design principles and affordances of gamified systems to optimize learning experiences and outcomes (Tondello et al., 2019; Nacke et al., 2018).

Gamification in education offers several potential benefits, including increased student engagement, motivation, and participation (Hamari et al., 2014; Landers & Landers, 2014). By providing immediate feedback, rewards, and opportunities for mastery, gamified learning environments can foster a sense of accomplishment and progress among learners (Hamari et al., 2016; Kapp, 2012). Moreover, gamification can facilitate personalized learning experiences tailored to individual preferences and learning styles, promoting a sense of ownership and autonomy (Seaborn & Fels, 2015).

However, gamification in education also presents certain challenges and limitations. These include concerns about potential over-reliance on extrinsic rewards, which may undermine intrinsic motivation and long-term engagement (Deci & Ryan, 1985; Nacke et al., 2018). Moreover, the effectiveness of gamification depends on careful design and implementation, as poorly designed gamified systems may lead to superficial engagement or gaming of the system (Deterding et al., 2011). Additionally, there is a need for empirical research to evaluate the long-term effects of gamification on learning outcomes and retention (Hamari et al., 2014; Landers & Landers, 2014).

2. METHOD AND MATERIALS

For this qualitative research study, a phenomenological approach was employed to explore the lived experiences and perceptions of students within gamified learning environments. Phenomenology was chosen due to its suitability for investigating individuals' subjective experiences and interpretations of phenomena (Creswell & Poth, 2016). Through phenomenological inquiry, we aimed to uncover the essence of student engagement, motivation, and learning outcomes within gamified educational contexts.

2.1. Participants

Participants were recruited from a university that had integrated gamified learning elements into selected courses. A purposive sampling method was utilized to ensure diversity in participant demographics, including age, gender, academic discipline, and prior experience with gamified learning. A total of 15 undergraduate students from various disciplines participated in the study.

2.2. Data collection tools

Semi-Structured Interviews: In-depth, semi-structured interviews were conducted with each participant to elicit rich descriptions of their experiences and perceptions of gamified learning. The interview protocol, developed based on the research questions and relevant literature, allowed for flexibility to explore emergent themes. Interviews were audio-recorded with participants' consent and transcribed verbatim for analysis.

Observations: Researchers observed students' interactions with gamified learning platforms in naturalistic settings, such as classrooms and computer labs. Field notes were taken to document behaviors, engagement levels, and contextual factors influencing students' experiences.

2.3. Data analysis techniques

Thematic analysis was employed to analyze the qualitative data collected from interviews, observations, and document analysis. The following steps were undertaken: (a) *Data Familiarization:* Researchers immersed themselves in the data through repeated readings of transcripts, field notes, and documents to gain familiarity with the content. (b) *Coding:* Initial codes were generated to capture meaningful segments of the data related to the research questions. Open coding was used to allow for flexibility and inclusivity of diverse perspectives. (c) *Theme Development:* Codes were clustered into broader themes and sub-themes based on similarities and connections. Themes were refined through iterative discussions among researchers. (d) *Data Interpretation:* Themes were interpreted about the research questions, theoretical frameworks, and existing literature to derive meaningful insights and implications.

2.4. Ethical consideration

Ethical guidelines were strictly followed throughout the research process to ensure the rights, privacy, and well-being of participants. Measures included obtaining informed consent, ensuring confidentiality and data security, and respecting participants' autonomy and cultural backgrounds.

3. RESULTS

Fifteen undergraduate students participated in the study, representing diverse academic disciplines and ranging in age from 19 to 23 years old. The sample included an equal distribution of male and female participants, with varying levels of prior experience with gamified learning environments.

3.1. Themes emerging from qualitative data analysis

3.1.1. Student perceptions of gamified learning environments

Participants expressed overall positive perceptions of gamified learning environments, highlighting elements such as points, badges, and leaderboards as motivating factors. Many students appreciated the game-like features, describing them as engaging and enjoyable. They reported feeling a sense of accomplishment and satisfaction when earning rewards and progressing through levels. Additionally, students noted that gamification enhanced their interest and enthusiasm for learning, making educational content more relatable and interactive. Overall, it seems that participants generally held positive perceptions of gamified learning environments, emphasizing their engaging nature and motivational aspects. Some quotes from the interviews are presented below:

Quote 1: *"I found the gamified elements fun and motivating. It made studying feel more like a game, and I was always excited to earn points and badges."*

Quote 2: *"The leaderboard was a great feature because it made me want to compete with my classmates and see where I stood. It added a fun and competitive aspect to learning."*

3.1.2. Factors influencing student engagement

Several factors emerged as influential in shaping student engagement within gamified learning environments. Personalization and customization options were cited as key motivators, allowing students to tailor their learning experience to their preferences and interests. Clear goals and feedback mechanisms were also highlighted as important factors in maintaining student engagement and fostering a sense of progress and achievement. Furthermore, social interaction and competition among peers were identified as drivers of engagement, as students enjoyed comparing their performance and achievements with others. Some quotes from the interviews are presented below:

Quote 3: *"I liked that I could customize my avatar and choose different challenges to complete. It made me feel more in control of my learning."*

Quote 4: *"Having clear goals and receiving feedback on my progress kept me motivated. Knowing what I needed to achieve helped me stay focused."*

3.1.3. Impact of gamification on academic achievement

Participants reported mixed perceptions regarding the impact of gamification on their academic achievement. While some students believed that gamified learning environments positively contributed to their academic performance by increasing motivation and engagement, others expressed skepticism about the effectiveness of gamification in facilitating deeper learning. Several participants noted that while gamified elements were enjoyable, they did not necessarily lead to improved comprehension or retention of course material. Some students also mentioned instances where the competitive nature of gamification hindered collaboration and knowledge-sharing among peers. Some quotes from the interviews are presented below:

Quote 5: *"I think gamification helped me stay more engaged in my studies. It made learning more enjoyable, and I felt more motivated to do well."*

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Quote 6: "*While gamification was fun, I'm not sure if it improved my understanding of the material. Sometimes I felt like I was just focused on earning points rather than learning.*"

3.1.4. Challenges and limitations of gamified learning

Despite the overall positive perceptions, participants identified several challenges and limitations associated with gamified learning environments. Technical issues, such as system glitches and inconsistent performance of gamified platforms, were commonly reported frustrations. Moreover, some students expressed concerns about the potential for gamification to overshadow the intrinsic value of learning, leading to superficial engagement and a focus on rewards rather than mastery. Additionally, there were concerns about the equity and fairness of gamified systems, particularly regarding the distribution of rewards and recognition. Some quotes from the interviews are presented below:

Quote 7: "*Sometimes the platform would glitch, and I'd lose progress or points. It was frustrating when that happened, and it made me less motivated to use it.*"

Quote 8: "*I think there were some students who were more competitive and focused on earning points than actually learning. It created a divide in the class.*"

Overall, while participants acknowledged the potential benefits of gamified learning environments in enhancing motivation and engagement, they also highlighted the importance of balancing gamification with meaningful learning experiences and addressing associated challenges to optimize its effectiveness in education.

4. DISCUSSION

The findings of this study provide valuable insights into the experiences and perceptions of undergraduate students within gamified learning environments. Overall, participants expressed positive attitudes towards gamification, highlighting its potential to enhance engagement and motivation in educational settings. The enjoyment derived from gamified elements, such as points, badges, and leaderboards, aligns with previous research emphasizing the motivational benefits of gamified learning (Hamari et al., 2014; Nacke et al., 2018). Personalization options and clear goals emerged as significant factors influencing student engagement, supporting the importance of autonomy and goal-setting theory in motivating learners (Deci & Ryan, 1985; Locke & Latham, 2002).

However, the impact of gamification on academic achievement was less clear-cut, with participants expressing mixed views. While some students perceived gamification as beneficial for increasing motivation and interest in learning, others questioned its effectiveness in facilitating deeper understanding and retention of course material. This discrepancy echoes previous research findings suggesting that while gamification can enhance extrinsic motivation, its effects on intrinsic motivation and learning outcomes may vary (Deterding et al., 2011; Kapp, 2012). Further exploration is needed to elucidate the nuanced relationship between gamification and academic achievement.

The findings of this study align with previous research highlighting the motivational benefits of gamified learning environments (Hamari et al., 2014; Nacke et al., 2018). Consistent with existing literature, participants appreciated the gamified elements for their ability to increase engagement and enjoyment in learning activities (Seaborn & Fels, 2015). However, the mixed perceptions regarding the impact on academic achievement are consistent with divergent findings in the literature, underscoring the need for context-specific investigations into the effectiveness of gamification in education (Hamari et al., 2016; Johnson et al., 2016).

The findings of this study contribute to the theoretical understanding of motivation and engagement in educational contexts. The positive reception of gamified learning environments supports theories such as

self-determination theory, which posits that individuals are motivated by intrinsic needs for autonomy, competence, and relatedness (Deci & Ryan, 1985). Additionally, the importance of clear goals and feedback mechanisms aligns with goal-setting theory, emphasizing the role of specific, challenging goals in driving motivation and performance (Locke & Latham, 2002). These theoretical frameworks provide a lens through which to interpret the observed effects of gamification on student engagement and motivation.

For educators, the findings underscore the potential benefits of incorporating gamified elements into course design to enhance student engagement and motivation. Providing opportunities for personalization and goal-setting can further optimize the effectiveness of gamified learning environments. However, educators should also be mindful of the potential limitations and challenges associated with gamification, such as technical issues and concerns about equity. Policymakers can support the integration of gamified learning approaches by providing resources and professional development opportunities for educators to effectively implement gamification in their teaching practices.

5. CONCLUSION

This study explored the experiences and perceptions of undergraduate students within gamified learning environments, yielding several key findings. Participants generally viewed gamification positively, appreciating its ability to enhance engagement and motivation. Personalization options and clear goals were identified as important factors influencing student engagement, while the impact of gamification on academic achievement was more nuanced. While some students perceived gamification as beneficial for motivation, others questioned its effectiveness in facilitating deeper learning. Challenges such as technical issues and concerns about equity were also noted.

The findings of this study have implications for both practice and research in educational contexts. For educators, the study highlights the potential benefits of incorporating gamified elements into course design to enhance student engagement and motivation. Providing opportunities for personalization and goal-setting can further optimize the effectiveness of gamified learning environments. However, educators should also be mindful of the potential limitations and challenges associated with gamification, such as technical issues and concerns about equity. Policymakers can support the integration of gamified learning approaches by providing resources and professional development opportunities for educators to effectively implement gamification in their teaching practices. For researchers, the study underscores the need for further investigation into the effectiveness of gamification in education, particularly its impact on academic achievement and the mechanisms underlying its effects on motivation and learning outcomes. Future research should employ larger, more diverse samples and longitudinal designs to explore the long-term effects of gamification on student outcomes. Additionally, qualitative studies exploring the perspectives of educators and administrators on the implementation and effectiveness of gamified learning approaches could provide valuable insights into the facilitators and barriers to adoption.

In conclusion, this study sheds light on the complex interplay between gamification, student engagement, and academic achievement in higher education settings. While gamification shows promise as a tool for enhancing motivation and interest in learning, its effectiveness in promoting deeper understanding and retention of course material requires further exploration. Addressing challenges such as technical issues and concerns about equity will be crucial for maximizing the potential of gamified learning environments in education. Ultimately, by leveraging the insights gained from this study, educators and policymakers can work towards creating more engaging and effective learning experiences for students in the digital age.

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Several limitations should be considered when interpreting the findings of this study. Firstly, the small sample size and single-site study design limit the generalizability of the results. Additionally, the reliance on self-report data may introduce bias, and the study's focus on undergraduate students may not capture the perspectives of other educational stakeholders, such as educators and administrators. Furthermore, the study's cross-sectional design precludes causal inferences about the relationship between gamification and academic achievement.

Future research should seek to address the limitations of this study by employing larger, more diverse samples and longitudinal designs to explore the long-term effects of gamification on student outcomes. Additionally, qualitative studies exploring the perspectives of educators and administrators on the implementation and effectiveness of gamified learning approaches could provide valuable insights into the facilitators and barriers to adoption. Furthermore, experimental research investigating the differential effects of specific gamification elements on motivation and learning outcomes could inform the design of evidence-based gamified learning interventions.

Overall, the findings of this study highlight the potential of gamified learning environments to enhance student engagement and motivation in higher education, while also underscoring the need for further research to elucidate their impact on academic achievement and address associated challenges.

Conflict of Interest: The authors declare no conflict of interest.

Ethical Approval: The study adheres to the ethical guidelines for conducting research.

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