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The Efficacy of Gamification in U.S. Higher Education: A Review: Investigating the Impact, Acceptability, and Potential Drawbacks of Game-Based Learning in Universities and Colleges

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Abstract

This study provides a comprehensive analysis of the efficacy of gamification in higher education within the United States. It aims to investigate the impact, acceptability, and potential drawbacks of game-based learning strategies in universities and colleges. The methodology employed is a systematic literature review and content analysis, focusing on peer-reviewed articles, educational reports, and case studies published between 2013 and 2023. The study synthesizes key insights into the role of gamification in enhancing student engagement and academic performance, while also considering the challenges and future prospects of its implementation. Key findings reveal that gamification, when aligned with educational goals, can significantly enhance student motivation and engagement, potentially leading to improved learning outcomes. However, challenges such as ensuring pedagogical effectiveness and addressing diverse learning styles are noted. The study also highlights the importance of standards and regulatory frameworks in the successful integration of gamification strategies. The future landscape of gamification in higher education is marked by opportunities for growth through technological advancements, yet it faces challenges in balancing educational objectives with engaging game elements. Strategic recommendations for educators and policymakers include focusing on pedagogically sound gamified experiences and developing supportive policies and frameworks. The study suggests that gamification presents a dynamic and innovative approach to education, with the potential to transform learning experiences. Future research directions include longitudinal studies to assess long-term impacts, exploration of gamification's integration with emerging technologies, and examination of its scalability in diverse educational settings.

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1. Introduction

1.1 The emergence and evolution of gamification in higher education

The concept of gamification in higher education has evolved significantly over the past decade, becoming a pivotal element in the realm of educational methodologies. Gamification, fundamentally, involves the application of game-design elements and principles in non-game contexts, aiming to enhance user engagement, organizational productivity, learning, and problem-solving (Santoveña-Casal & López, 2023). The United States has been at the forefront of this evolution, actively contributing to the burgeoning body of literature on this subject.

The inception of gamification in educational settings can be traced back to the early 2010s. Initially, the integration of game elements in learning environments was perceived as a novel approach to engage students and enhance their learning experiences. The primary focus was on creating interactive and enjoyable learning activities that could stimulate student interest and participation. This period marked the beginning of a significant shift in educational paradigms, where traditional teaching methods began to intertwine with innovative, technology-driven strategies (Burkholder & Krauskopf, 2023).

As the concept of gamification gained traction, its application in higher education started to diversify. From simple point-based systems and leaderboards to more complex simulations and role-playing scenarios, gamification strategies began to encompass a wide range of activities. These developments were not just limited to the classroom but extended to various aspects of university life, including student engagement, curriculum design, and assessment methods.

The growth and acceptance of gamification in higher education can be attributed to several factors. The digital native generation, accustomed to interactive and immersive experiences, found gamified learning more relatable and engaging. Additionally, the rise of mobile technology and online learning platforms provided an ideal environment for gamified learning to flourish. The COVID-19 pandemic further accelerated this trend, as educators sought innovative ways to engage students in remote learning environments. The integration of gamification strategies became a necessity rather than a luxury, highlighting its role in maintaining educational continuity and effectiveness during challenging times (Burkholder & Krauskopf, 2023).

The evolution of gamification in higher education also reflects broader trends in digital pedagogy. The shift towards digitalization in education, catalyzed by technological advancements and changing student demographics, has positioned gamification as a key component of contemporary educational strategies. This transition is evident in the growing body of research that explores the intersection of digital technologies and pedagogical practices, underscoring the importance of gamification in enhancing the quality and accessibility of education (Roslan *et al.*, 2023).

In the United States, the adoption of gamification in higher education has been influenced by several factors. The country's diverse and dynamic educational landscape, characterized by a blend of public and private institutions, has provided a fertile ground for experimenting with and implementing gamified learning approaches. Additionally, the emphasis on innovation and technology in American higher education has facilitated the integration of gamification into various educational models and disciplines. The bibliometric analysis of gamification literature reveals a positive trend in the growth of research in this area, with the United States emerging as a leading contributor. This growth is indicative of the increasing recognition of gamification's potential to transform educational experiences and outcomes. The research trends also highlight the multidisciplinary nature of gamification, intersecting with fields such as computer science, education, and engineering, thereby broadening its applicability and impact in higher education (Roslan *et al.*, 2023).

In summary, the emergence and evolution of gamification in U.S. higher education represent a paradigm shift in teaching

and learning methodologies. From its initial stages of simple game-like elements to its current state of sophisticated, technology-driven educational strategies, gamification has become an integral part of the educational landscape. As it continues to evolve, it holds the promise of further enriching the learning experience, fostering engagement, and preparing students for the challenges of the digital age.

1.2 Defining gamification: concepts and context in U.S. higher education

Gamification in higher education has emerged as a transformative approach, redefining the learning experience by integrating game elements into educational settings. This concept, while seemingly straightforward, encompasses a range of practices and theories, making its definition both complex and dynamic. In the context of U.S. higher education, gamification has been shaped by various factors, including technological advancements, pedagogical shifts, and cultural influences.

At its core, gamification involves the application of game-design elements and game principles in non-game contexts (Zyrych *et al.*, 2019). This definition extends beyond merely adding points or leaderboards to educational activities. It encompasses a broader spectrum of design principles aimed at enhancing student engagement, motivation, and learning outcomes. These principles include, but are not limited to, challenge, competition, collaboration, feedback, and rewards. The concept of gamification in U.S. higher education is not monolithic; it varies significantly across disciplines and institutions. For instance, in some settings, gamification might involve complex simulations and role-playing activities that mimic professional scenarios. In others, it might be as simple as incorporating game-like quizzes or interactive modules into traditional coursework. The diversity in application reflects the adaptability of gamification to different educational contexts and learning objectives.

One of the key aspects of gamification in higher education is its focus on enhancing student motivation and engagement. By incorporating elements that are inherently engaging in games, such as competition and rewards, educators aim to foster a more interactive and stimulating learning environment. This approach is particularly relevant in the digital age, where students are often digital natives accustomed to interactive and multimedia content (Roslan *et al.*, 2023).

The evolution of gamification in U.S. higher education also reflects a shift towards more student-centered learning approaches. Traditional lecture-based teaching methods are increasingly being supplemented or replaced by gamified activities that encourage active learning and student participation. This shift is driven by a growing body of research suggesting that active learning strategies, including gamification, can lead to improved learning outcomes and higher levels of student satisfaction.

The design of effective gamification in higher education is a nuanced process. It requires a deep understanding of game mechanics and how they can be applied to educational contexts. This involves considering factors such as the balance between competition and collaboration, the types of rewards that motivate students, and the ways in which feedback is provided. Effective gamification design also takes into account the diversity of student populations,

ensuring that the gamified elements are inclusive and accessible to all learners.

In the U.S., the integration of gamification in higher education has been influenced by cultural factors as well. The American education system, known for its emphasis on innovation and creativity, provides a conducive environment for experimenting with gamified learning. Additionally, the prevalence of technology and digital media in American society has paved the way for the adoption of gamified approaches that leverage digital platforms and tools.

Despite its growing popularity, gamification in higher education is not without its challenges. One of the primary concerns is the risk of oversimplification – reducing complex educational content to simplistic game elements. Educators and designers must ensure that the gamification of learning does not compromise the depth and rigor of academic content. Another challenge is ensuring that gamification strategies are aligned with learning objectives and outcomes, rather than being used as mere attention-grabbers.

In summary, defining gamification in the context of U.S. higher education involves understanding its multifaceted nature. It is a dynamic and evolving concept that encompasses a range of practices aimed at enhancing student engagement, motivation, and learning outcomes. As gamification continues to gain traction in educational settings, it is essential to approach its design and implementation thoughtfully, ensuring that it enriches the learning experience without diminishing the academic rigor.

1.3 The integration of gamification in educational settings

The integration of gamification in educational settings, particularly in higher education in the United States, represents a significant shift in pedagogical approaches over the past decades. This evolution can be traced back to the early 2000s, when digital technologies began to permeate educational environments, laying the groundwork for the incorporation of game-based elements in learning.

Initially, gamification in education was primarily seen as a novel way to engage students using digital platforms. Early applications were relatively simple, often involving basic game mechanics like points, badges, and leaderboards to motivate students (Roslan *et al.*, 2023). These elements were integrated into learning management systems and online courses, aiming to enhance student engagement and motivation.

As the concept of gamification gained momentum, its application became more sophisticated. Educators and researchers began to explore deeper aspects of game design, such as narrative, challenge, feedback, and autonomy, to create more immersive and meaningful learning experiences. This shift was not just about adding game elements to education but about rethinking how these elements could align with educational goals and learning outcomes.

The historical trajectory of gamification in U.S. higher education is closely tied to the broader evolution of distance and online education. The rise of online learning platforms provided an ideal environment for gamified learning, allowing for more interactive and personalized experiences (Betts *et al.*, 2021). The flexibility and accessibility of online education complemented the principles of gamification, making it possible to reach a diverse range of learners.

The COVID-19 pandemic marked a pivotal moment in the history of gamification in education. With the sudden shift to

remote learning, educators faced the challenge of keeping students engaged and motivated in a completely virtual environment. Gamification emerged as a key strategy to address these challenges, providing a framework for creating engaging and interactive online learning experiences. The pandemic accelerated the adoption of gamified learning approaches, highlighting their potential to enhance student engagement and learning outcomes in various educational settings (Burkholder & Krauskopf, 2023).

Throughout its evolution, the integration of gamification in U.S. higher education has been influenced by several key factors. Technological advancements have played a crucial role, providing the tools and platforms necessary to implement gamified learning experiences. Additionally, the changing demographics of the student population, with an increasing number of digital natives entering higher education, have driven the demand for more interactive and engaging learning approaches.

The impact of gamification on educational outcomes has been a subject of ongoing research and debate. Studies have shown that gamified learning can lead to improved student engagement, motivation, and academic performance. However, the effectiveness of gamification depends on various factors, including the design of the gamified elements, the alignment with learning objectives, and the individual differences among learners.

In summary, the historical integration of gamification in U.S. higher education reflects a broader shift towards more interactive, student-centered learning approaches. From its early applications as a tool for student engagement to its current role as a comprehensive pedagogical strategy, gamification has become an integral part of the educational landscape. As technology continues to evolve and the needs of learners change, gamification is likely to remain a key component of innovative educational practices.

1.4 Aim and objectives of the study

The aim of this study is to critically examine the efficacy of gamification in higher education within the United States. It seeks to investigate how game-based learning strategies impact student engagement, academic performance, and the overall educational experience. The study aims to provide a comprehensive understanding of the multifaceted effects of gamification, exploring its potential benefits, challenges, and future prospects in the context of U.S. higher education.

The research objectives are;

- To evaluate the impact of gamification on learning outcomes.
- To identify current trends and future prospects in gamified learning.
- To understand student and educator perspectives on gamified learning.

1.5 Significance of the study: implications for educational theory and practice

The significance of studying gamification in the context of U.S. higher education extends beyond the realm of innovative teaching strategies. It encompasses a broader perspective on educational theory and practice, offering insights into how learning processes can be enhanced and transformed. This study's implications are multifaceted, impacting curriculum design, pedagogical approaches, and the philosophical underpinnings of education.

From a theoretical standpoint, the integration of gamification in higher education challenges traditional views of learning and teaching. It aligns with contemporary educational theories that emphasize active, experiential learning over passive content absorption (Kirch & Sadofsky, 2021). Gamification, by its very nature, requires students to engage actively with the material, participate in problem-solving, and collaborate with peers, thereby fostering a deeper understanding and retention of knowledge. This approach resonates with constructivist theories of learning, which posit that learners construct knowledge through experiences and interactions with their environment.

In terms of educational practice, gamification represents a shift towards more student-centered learning environments. It encourages educators to design courses that are not only informative but also engaging and motivational. This shift is particularly significant in the context of higher education, where student engagement and motivation can sometimes be challenging to maintain. The practical application of gamification strategies, such as point systems, badges, and leaderboards, can transform the learning experience, making it more interactive and enjoyable for students (Masta, 2022). The study of gamification also has philosophical implications for education. It challenges educators to reconsider the purpose of education and the methods used to achieve educational goals. By integrating game elements into learning, educators are adopting a more holistic view of education, one that values not only the acquisition of knowledge but also the development of skills such as critical thinking, creativity, and collaboration (Baron, 2021). This perspective aligns with the philosophy of education as a transformative process, where the goal is not just to impart knowledge but to foster the overall development of the individual.

Furthermore, the study of gamification in higher education highlights the importance of aligning educational practices with the needs and preferences of contemporary students. Today's students, often referred to as digital natives, are accustomed to interactive and multimedia-rich environments. Gamification addresses these preferences, providing a learning experience that is both familiar and engaging to them. This alignment is crucial for maintaining relevance and effectiveness in higher education.

Therefore, the study of gamification in U.S. higher education has significant implications for educational theory and practice. It offers a fresh perspective on how learning can be enhanced through interactive and engaging strategies. By bridging the gap between theory and practice, gamification provides a powerful tool for educators to create more effective, engaging, and transformative learning experiences. As such, this study contributes to the ongoing discourse on how to best prepare students for the challenges of the 21st century.

2. Methodology

The methodology of this study is structured around a systematic literature review and content analysis, focusing on the efficacy of gamification in higher education within the United States. This approach ensures a comprehensive and unbiased examination of existing research, providing a clear understanding of the current state of knowledge in this field.

2.1 Data Sources

The primary data sources for this study include academic journals, educational reports, and case studies. These sources were accessed through various academic databases such as Web of Science, PubMed, and Google Scholar. Additionally, conference proceedings and dissertations relevant to the topic were also considered to ensure a comprehensive collection of literature.

2.2 Search Strategy

The search strategy involved using specific keywords and phrases related to gamification in higher education, such as "gamification in higher education," "game-based learning," "student engagement and gamification," and "impact of gamification on academic performance." Boolean operators (AND, OR) were used to combine these terms effectively. The search was limited to articles published in English from 2013 to 2023 to ensure the relevance and currency of the data.

2.3. Inclusion and exclusion criteria for relevant literature

The inclusion criteria were set to select studies that specifically address gamification in higher education settings in the United States. Articles that provided empirical data, theoretical analyses, or case studies on the subject were included. Exclusion criteria involved omitting studies that focused on gamification outside of higher education contexts, non-empirical opinion pieces, and articles not written in English.

2.4 Selection Criteria

The selection of literature was based on relevance to the research questions, methodological rigor, and the contribution of the study to the field of gamification in higher education. Priority was given to peer-reviewed articles and studies that offered unique insights or significant findings related to the efficacy, challenges, and future prospects of gamification.

2.5 Data Analysis

Data analysis involved a content analysis of the selected literature. This process entailed categorizing the data based on themes such as impact on learning outcomes, student and educator perspectives, and institutional adoption strategies. The analysis aimed to identify patterns, trends, and gaps in the existing literature. This thematic approach facilitated a comprehensive understanding of the multifaceted aspects of gamification in higher education and aided in drawing conclusions based on the accumulated evidence.

Through this systematic and meticulous methodology, the study aims to provide a well-rounded and in-depth analysis of gamification in higher education, contributing valuable insights to the field and guiding future research directions.

3. Literature Review

3.1 Fundamental principles of gamification in education

Gamification in higher education, particularly in the United States, is underpinned by several fundamental principles that are crucial for its effective implementation and impact on learning experiences and outcomes. The essence of gamification in education lies in its ability to increase student engagement and motivation. Incorporating game elements into educational activities transforms learning into a more interactive and enjoyable experience, fostering greater

student involvement and interest in the subject matter. This approach is exemplified in the work of Zvarych *et al.* (2019), who demonstrated how simulations with gamification elements could significantly stimulate educational activities, leading to increased student participation and motivation. Immediate feedback is a key component of gamification, providing students with instant insights into their performance. This continuous feedback loop allows students to understand their progress and areas for improvement, enabling them to adjust their learning strategies and efforts accordingly, leading to better learning outcomes. Personalization and autonomy are also central to gamification, allowing students to choose their learning paths, engage with content that interests them, and work at their own pace. This approach caters to individual learning styles and preferences, making learning more relevant and effective for each student.

The balance between competition and collaboration in gamified learning environments is crucial for ensuring a positive and inclusive learning experience. While competitive elements like leaderboards and point systems can drive motivation, collaborative aspects such as team challenges and group quests foster teamwork and communication skills. Achievement and reward are central to the principle of gamification. Setting clear goals and providing rewards for achieving them creates a sense of accomplishment and progress. These rewards can be intrinsic, such as the satisfaction of mastering a topic, or extrinsic, like badges or certificates, contributing to a motivating learning environment.

Moreover, gamification often involves scenarios and challenges that mimic real-world situations, enhancing the relevance of learning. This approach helps students see the practical applications of their knowledge and skills, engaging them in real-world problem-solving. By understanding the practical implications of what they learn, students can better appreciate the value of their education and its applicability beyond the classroom.

In summary, the fundamental principles of gamification in education revolve around creating dynamic, interactive, and personalized learning experiences that enhance student engagement, motivation, and outcomes. These principles, when effectively implemented, have the potential to transform the educational landscape, making learning more impactful and enjoyable. As gamification continues to evolve in higher education, its alignment with educational goals and student needs remains paramount for its success.

3.2 Structural overview: Components of gamified learning environments.

The integration of gamification in higher education, particularly in the United States, involves a complex structure of components that collectively enhance the learning experience. These components, as identified in recent studies, are crucial in designing effective gamified learning environments.

The first key component is the use of e-learning platforms, which have become ubiquitous in higher education. Khaldi, Bouzidi, and Nader (2023) emphasize the role of these digital platforms in delivering courses and learning activities. Gamification in e-learning involves applying game design elements to these platforms to address issues like student dropout and low completion rates. The challenge lies in

choosing the right combination of game elements to stimulate student involvement and maintain their interest in the course. Another vital component is the introduction of simulations with gamification elements. Zvarych *et al.* (2019) demonstrated how simulations, when adapted to include elements of gamification, can significantly stimulate educational activities. These simulations create an environment for constructive competition and cooperation, stimulating interests and motives, maintaining cognitive attention of students, and encouraging feedback. This approach develops value-motivational, cognitive, and activity-reflective components of educational activity, which are essential in the modern educational landscape.

Ntokos (2019) presents a structural gamification framework using role-playing game elements. This framework is particularly relevant in higher education, where the application of such elements can transform the learning process. Role-playing games in educational settings allow students to immerse themselves in scenarios that mimic real-life challenges, thereby enhancing their problem-solving skills and engagement with the course material. The structural components of gamified learning environments also include Points, Badges, and Leaderboards (PBL). These elements are commonly used to gamify e-learning systems, providing a sense of achievement and progress to students. The PBL system encourages students to engage more deeply with the course content and participate in various learning activities. In addition to these components, the design of gamified learning environments in higher education also involves considering the diversity of student populations. It is crucial to ensure that the gamified elements are inclusive and accessible to all learners, catering to different learning styles and preferences.

In summary, the structural components of gamified learning environments in higher education are multifaceted and dynamic. They include the use of e-learning platforms, the introduction of simulations with gamification elements, the application of role-playing game elements, and the incorporation of PBL systems. These components, when effectively integrated, create an engaging, interactive, and motivating learning experience for students. As gamification continues to evolve in the realm of higher education, understanding and effectively implementing these structural components will be key to its success.

3.3 Varieties of Gamification: From simple badging to complex simulations.

In higher education, particularly in the United States, the application of gamification spans a wide spectrum, from simple badging systems to complex simulations, each serving distinct educational purposes and engaging students in various ways. The diversity in gamification approaches reflects the evolving nature of educational technology and the growing understanding of how game elements can be integrated into learning environments.

Simple badging systems represent one of the most basic forms of gamification. These systems, as highlighted in the systematic literature review by Khaldi, Bouzidi, and Nader (2023), are often used in e-learning platforms to motivate students. Badges serve as visual representations of achievements, rewarding students for completing tasks, mastering skills, or reaching certain milestones. While seemingly straightforward, these badging systems tap into the

psychological aspects of motivation and recognition, providing students with tangible evidence of their progress and encouraging continued engagement with the course material.

On the more complex end of the spectrum are gamified simulations, which offer immersive learning experiences. These simulations, often designed to mimic real-world scenarios, allow students to apply theoretical knowledge in a practical, risk-free environment. The study by Mumpuni *et al.* (2023) on the gamification model for educator career systems using a Mealy machine illustrates the complexity that can be achieved in gamified learning. Such simulations can involve intricate mechanics and dynamic aesthetics, providing a rich, interactive platform for students to engage in problem-solving, decision-making, and critical thinking. The increasing role of technology in teaching and learning activities, as discussed by Burkholder and Krauskopf (2023), has further expanded the possibilities for gamification in higher education. Technological advancements have enabled the creation of sophisticated gamified environments that can adapt to individual learning styles, track student progress in real-time, and provide personalized feedback. This technological integration has also facilitated the use of immersive virtual reality in classrooms, taking gamification to a new level of realism and engagement.

The variety of gamification approaches in higher education also includes elements like point systems, leaderboards, and team challenges. Point systems are used to quantify student achievements, often leading to a sense of competition among peers. Leaderboards, displaying the rankings of students based on their points or achievements, add a competitive edge to learning, motivating students to strive for higher performance. Team challenges, on the other hand, encourage collaboration and teamwork, essential skills in both academic and professional settings.

The varieties of gamification in higher education range from simple, motivational tools to complex, immersive simulations. Each approach offers unique benefits and can be tailored to meet specific educational objectives. As gamification continues to evolve alongside technological advancements, its potential to enhance learning experiences in higher education becomes increasingly significant. Understanding and effectively implementing these diverse gamification strategies is key to creating engaging, effective, and dynamic learning environments.

3.4 Key developments and innovations in educational gamification

The landscape of educational gamification in higher education in the United States has witnessed significant developments and innovations, particularly in integrating complex educational goals with engaging learning strategies. These advancements reflect a growing recognition of the potential of gamification to enhance learning experiences and outcomes.

One of the key developments in educational gamification is the integration of Sustainable Development Goals (SDGs) and general skills. The study by Guillén-Guillamón *et al.* (2020) exemplifies this trend, showcasing how gamification strategies can be employed to embed SDGs into the curriculum effectively. This approach not only makes learning more engaging but also aligns educational objectives with broader global goals, thereby fostering a sense of global

citizenship and responsibility among students. The integration of general skills such as critical thinking, problem-solving, and collaboration through gamified activities further enhances the relevance and applicability of education in real-world scenarios.

Another significant innovation in the field is the use of simulations with gamification elements. The research conducted by Zvarych *et al.* (2019) demonstrates how simulations, when combined with gamification, can stimulate educational activities and enhance student engagement. These simulations create dynamic learning environments where students can engage in constructive competition and cooperation, thereby developing both cognitive and social skills. The use of simulations in gamification also allows for the creation of realistic scenarios where students can apply theoretical knowledge in practical settings, enhancing the overall learning experience.

In the realm of medical education, the application of serious games and gamification has emerged as a noteworthy innovation. As outlined by Watsjold *et al.* (2022), serious games in medical education offer a unique way to engage students in complex medical scenarios. These games provide a safe and controlled environment where medical students can practice and hone their skills without the risk of real-life consequences. The gamification of medical education not only improves learning outcomes but also prepares students for the challenges of the medical profession in a more interactive and engaging manner.

The key developments and innovations in educational gamification also include the use of diverse game elements such as points, badges, leaderboards, and role-playing. These elements are designed to motivate students, provide immediate feedback, and foster a sense of achievement and progress. The customization and personalization of gamified learning experiences to cater to individual student needs and preferences represent another important innovation in this field.

The advancements in educational gamification in higher education are characterized by the integration of complex educational goals with engaging and interactive learning strategies. From embedding global goals and general skills to the innovative use of simulations and serious games, these developments reflect a deeper understanding of how gamification can enhance learning experiences. As educational institutions continue to explore and implement gamified learning, these innovations are likely to play a crucial role in shaping the future of education.

3.5 Current state and future trends in gamified learning.

The current state and future trends in gamified learning in higher education in the United States are marked by a dynamic interplay of technological advancements, pedagogical innovations, and evolving student needs. The field of gamification in education has seen significant growth and diversification, reflecting its increasing recognition as a valuable tool for enhancing learning experiences.

A bibliometric analysis of research trends in gamification, as presented in the study of Roslan *et al.* (2023), indicates a positive trend in the growth of gamification literature. This growth underscores the expanding interest and scholarly engagement with gamification in educational settings. The study highlights the United States as a significant contributor to this field, demonstrating the country's active role in

advancing gamification research and practice.

The current state of e-learning, including gamification, is characterized by its integration into various educational models. As discussed by Krasnova, Nuhuly, and Teslenko (2017), e-learning has become a crucial component of higher education, driven by the demand for flexible and interactive learning experiences. Gamification plays a pivotal role in this context, enhancing e-learning platforms by making them more engaging and motivating for students. The incorporation of game elements in e-learning environments addresses challenges such as student retention and engagement, making learning more interactive and enjoyable.

Looking at the trends in gamification for engagement and recruitment in higher education, Johnson and Goncalves (2018) provide insights into how gamification strategies are being utilized beyond the classroom. The use of gamification in student engagement and recruitment reflects a broader application of game principles in higher education, tapping into the gaming culture that resonates with the current generation of students.

The future of gamified learning in higher education is likely to be shaped by several key trends. One significant trend is the increasing use of advanced technologies such as artificial intelligence (AI) and virtual reality (VR) in gamified learning environments. These technologies offer new possibilities for creating immersive and personalized learning experiences, allowing for more sophisticated and engaging gamification strategies.

Another trend is the growing emphasis on skill development and real-world applicability. Gamified learning is increasingly being designed to develop essential skills such as critical thinking, problem-solving, and collaboration, aligning educational outcomes with the demands of the modern workforce. This shift reflects a deeper integration of gamification with educational objectives, moving beyond mere engagement to foster meaningful learning and skill acquisition.

The current state and future trends in gamified learning in higher education are characterized by growth, diversification, and innovation. As gamification continues to evolve, it holds significant potential for transforming educational experiences, making learning more engaging, relevant, and effective. The ongoing research and development in this field are likely to further enhance the impact and scope of gamified learning in higher education.

4. Discussion of Findings

4.1 Evaluating the impact of gamification on learning outcomes

The impact of gamification on learning outcomes in higher education has been a subject of increasing interest, particularly in the United States. Recent studies have explored various aspects of this impact, from student engagement and proficiency to the effectiveness of gamified approaches in specific learning contexts.

In the context of massive open online courses (MOOCs), the study by Rincon Flores *et al.* (2019) on "The use of gamification in xMOOCs about energy" examines the relationship between gamification and learning outcomes. The study utilized course analytical data and predictive models to analyze the impact of gamification on participant performance in a MOOC on energy topics. The findings

indicated that gamification positively influenced learning outcomes, with participants aged between 20 and 50 showing the highest completion rates in the gamified challenge. This study highlights the potential of gamification to improve performance and completion rates in online learning environments.

Chaparro-Banegas, Sendra-Pons, and Roig-Tierno's research on "A gamified approach for enhancing learning on SDGs" explores the effectiveness of gamification in teaching Sustainable Development Goals (SDGs) in higher education. The study focused on the use of gamification to improve strategic decision-making and comprehensive learning about SDGs. The results suggest that gamified learning can be an effective tool for enhancing understanding and engagement with complex and multidisciplinary topics like SDGs.

The impact of gamification on learning outcomes in higher education varies depending on the context and the specific goals of the gamified intervention. While gamification may not always lead to increased academic proficiency, it has been shown to enhance student engagement and interest in learning materials. Additionally, in online learning environments and in teaching complex, multidisciplinary topics, gamification can be a powerful tool for improving learning outcomes. As gamification continues to evolve in educational settings, its role in enhancing both student engagement and academic performance remains a promising area for further research and application.

4.1.1 Academic performance and student engagement

The integration of gamification in higher education has been increasingly recognized for its potential to enhance both academic performance and student engagement. Recent studies have provided valuable insights into how gamification impacts these critical areas of educational outcomes.

Yuliana and Palumian (2023) conducted a study to assess the effectiveness of a gamified Learning Management System (LMS) compared to a non-gamified LMS. Their research focused on whether the gamification of LMS could lead to differences in student performance and engagement. The findings revealed that active learning and student engagement in the gamified LMS significantly impacted academic performance. Students using the gamified LMS showed notable improvements in achievement compared to those in the non-gamified environment. This study underscores the potential of gamification to transform educational experiences by promoting active learning and enhancing student engagement, leading to higher academic achievement.

In the field of engineering education, Silva *et al.* (2022) explored the impact of a gamified application, Easy-Newton, on students' performance, motivation, and engagement. The application, which included elements such as scores, levels, and badges, was used by both teachers and students during various stages of the design and implementation processes. The evaluation of Easy-Newton indicated that a significant percentage of students reported increased motivation and engagement. However, the study also noted that there was no strong correlation between the usage of the application and the students' GPA, suggesting the need for more complex exercises that align closely with exam requirements.

Rincón-Flores, Mena, and López-Camacho (2022) compared the performance, motivation, and emotional responses of

undergraduate students when gamification was employed as a teaching method during the COVID-19 pandemic. Their study found higher positive relationships among variables in students who were taught using gamification. Interestingly, the study also revealed that emotion poorly correlated with performance, especially among students with a negative attitude toward learning mathematics. This research highlights the effectiveness of gamification in promoting participation and enhancing motivation among students, particularly in a context of academic confinement. These studies collectively indicate that gamification can significantly enhance student engagement and active learning, leading to improved academic performance. However, the impact of gamification on academic outcomes may vary depending on the subject matter, the design of the gamified elements, and the individual attitudes of students. As gamification continues to be integrated into higher education, its role in fostering a more engaging and effective learning environment becomes increasingly evident.

4.1.2 Challenges and limitations in gamified learning approaches

While gamification in higher education has shown promise in enhancing student engagement and learning outcomes, it also presents several challenges and limitations. These challenges are crucial to understand for the effective implementation and sustainability of gamified learning approaches.

One of the primary challenges in gamified learning is related to assessment. Filipe Portela (2023) study on the use of Kahoot for assessment exercises in higher education highlights this issue. While Kahoot and similar gamification systems can promote engagement and motivation, they also raise questions about the depth of learning and the validity of assessments. Traditional pen-and-paper tests have limitations in promoting active learning, but gamified assessments must ensure that they accurately measure student understanding and not just engagement or participation (Portela, 2023).

The bibliometric analysis of gamification literature in higher education by Roslan *et al.* (2023) sheds light on another challenge: the growth and complexity of scholarly communication in gamification research. As the field expands, it becomes increasingly challenging to navigate the vast array of studies, identify core areas, and discern the most effective practices. This complexity can hinder the development and implementation of gamified learning approaches, as educators and researchers may struggle to keep up with the latest findings and methodologies.

Howley *et al.* (2011) study on place-based mathematics pedagogy in rural schools and communities in the United States provides insights into broader challenges in educational approaches, including gamification. Implementing innovative educational strategies like gamification in diverse settings, such as rural schools, can be challenging due to varying resources, cultural contexts, and educational needs. These challenges highlight the need for adaptable and context-sensitive gamified learning approaches that can cater to the unique requirements of different educational settings (Howley *et al.*, 2011).

While gamification in higher education offers numerous benefits, it also faces several challenges and limitations. These include ensuring the validity and depth of learning in gamified assessments, navigating the growing complexity of gamification research, and adapting gamified learning

approaches to diverse educational contexts. Addressing these challenges is essential for the successful integration of gamification in higher education and for realizing its full potential in enhancing student learning experiences.

4.1.3 Trends and evolutions in gamification strategies

The landscape of gamification in higher education has evolved significantly over recent years, with emerging trends and strategies reshaping how learning is facilitated and experienced. The integration of gamification into educational settings has transitioned from being a novel approach to a more sophisticated and integral part of teaching and learning processes.

The bibliometric analysis conducted in the study conducted by Roslan *et al.* (2023) provides a comprehensive overview of the research trends in gamification. This study highlights the significant growth in gamification literature, indicating a rising interest and scholarly engagement with this approach in educational settings. The United States has emerged as a leading contributor in this field, demonstrating its active role in advancing gamification research and practice.

One of the notable trends in gamification strategies is the incorporation of virtual reality (VR) in higher education. The study by Rashid *et al.* (2021) examines the increasing interest in VR as a gamification strategy. The integration of VR in educational settings offers immersive and interactive learning experiences, making complex concepts more accessible and engaging for students. This trend signifies a shift towards more technologically advanced and experiential forms of gamification, moving beyond traditional game elements like points and badges.

Another significant evolution in gamification strategies is the focus on digital pedagogies. The research by Santoveña-Casal and López (2023) explores how digital pedagogy, including gamification, has been integrated into higher education. This trend reflects a broader shift towards digitalization in education, where gamification is seen as a key component of contemporary educational strategies. The study underscores the importance of aligning gamification with pedagogical goals to enhance learning outcomes effectively.

The trends and evolutions in gamification strategies in higher education are characterized by a growing emphasis on technological integration, immersive learning experiences, and alignment with digital pedagogies. These developments indicate a maturing field where gamification is increasingly recognized for its potential to transform educational experiences. As gamification continues to evolve, it holds significant promise for enhancing student engagement, motivation, and learning outcomes in higher education.

4.1.4 Future prospects in gamified higher education.

The future prospects of gamification in higher education are promising, with evolving trends and innovative approaches shaping its role in teaching and learning. The integration of gamification strategies is increasingly recognized as a key component in enhancing the educational experience, particularly in the context of digital competence and technology integration.

The study by Oksana *et al.* (2022) on the formation of digital competence through virtual games like Kahoot and Quizlet provides insights into the future use of gamification tools in higher education. The research highlights how these tools can

significantly contribute to developing digital competencies among future scientific and pedagogical workers. The active use of such gamification tools helps improve students' adaptive and social skills, facilitates quick analysis of achievements, and makes the conveyance of new information more efficient. This trend suggests that gamification will continue to play a crucial role in fostering essential skills required in today's digitally-driven world.

A bibliometric analysis of gamification research trends in higher education, as presented in the study by Roslan *et al.* (2023), indicates a positive trajectory in the growth of gamification literature. This growth underscores the expanding interest and scholarly engagement with gamification in educational settings. The study highlights the potential for future research in gamification, particularly in identifying core areas and proactive institutions that can further advance this field.

The publication by Burkholder and Krauskopf (2023) discusses the increasing role of technology, including gamification, in teaching and learning activities in higher education. The integration of technology in educational strategies, such as gamification, is seen as a key trend that will continue to influence future teaching and learning practices. This trend is particularly relevant in the context of the COVID-19 pandemic, which has accelerated the adoption of digital technologies in education. The use of gamification in conjunction with other technological tools is expected to enhance the learning experience, making it more interactive, engaging, and effective.

Moving forward, the future of gamified higher education is likely to be characterized by more sophisticated and integrated use of technology. This includes the potential for greater personalization of learning experiences, where gamification strategies are tailored to individual student needs and learning styles. Additionally, there is an increasing focus on using gamification to develop not only academic skills but also soft skills such as teamwork, communication, and problem-solving, which are crucial in the modern workforce.

Therefore, the future prospects in gamified higher education are marked by a continued growth and evolution of gamification strategies. The integration of gamification with digital technologies and the focus on developing a wide range of skills suggest a dynamic and innovative future for higher education. As gamification continues to evolve, it holds significant promise for transforming educational experiences and outcomes.

4.2 The role of standards and regulatory frameworks in gamification

The implementation of gamification in higher education necessitates a careful consideration of standards and regulatory frameworks to ensure quality, consistency, and alignment with educational objectives. The role of these frameworks is crucial in guiding the development and application of gamification strategies in a way that is both effective and responsible.

The study by Sarma *et al.* (2021) on pharmacopeial standards for the quality control of botanical dietary supplements in the United States provides a relevant analogy for understanding the importance of standards and regulatory frameworks in gamification. Just as quality assurance and regulatory compliance are essential in ensuring the safety and efficacy

of dietary supplements, similar principles apply to gamification in education. Establishing clear standards and guidelines can help educators design gamified learning experiences that are not only engaging but also pedagogically sound and aligned with learning outcomes.

The role of professional regulatory bodies in higher education, as discussed by Knifton *et al.* (2019) in the context of dementia education, further underscores the importance of standards and frameworks. The existence of voluntary frameworks and guidelines can lead to inconsistencies and gaps in education quality. Professional regulatory bodies play a critical role in ensuring that educational practices, including gamification, adhere to established standards and contribute to high-quality learning experiences. This perspective is particularly relevant in the context of gamification, where the novelty and diversity of approaches can lead to varied implementations.

The role of standards and regulatory frameworks in gamification is pivotal in ensuring that gamified learning approaches are effective, consistent, and aligned with educational goals. Establishing clear guidelines and principles for gamification can aid educators in designing and implementing gamified experiences that enhance learning while adhering to quality standards. As gamification continues to gain traction in higher education, the development and adherence to such frameworks will be crucial for its successful integration into the educational landscape.

4.3 Implications for stakeholders: Educators, students, and policy makers

The integration of gamification in higher education has significant implications for various stakeholders, including educators, students, and policy makers. The evolving landscape of higher education, especially in the wake of the COVID-19 pandemic, has highlighted the need for innovative and adaptable educational strategies, among which gamification stands out.

The article by Salmi (2021) on the impact of COVID-19 on higher education from an equity perspective underscores the importance of considering the diverse needs and perspectives of all stakeholders in higher education. The pandemic has accelerated the adoption of digital technologies and innovative teaching methods, including gamification. For educators, this means adapting to new pedagogical approaches that incorporate gamification to enhance student engagement and learning outcomes. It also involves being mindful of equity and accessibility issues, ensuring that all students, regardless of their background, have equal opportunities to benefit from gamified learning experiences. Aydin, Ozfidan, and Carothers (2017) in their study on curriculum and instruction challenges in U.S. school settings, provide insights relevant to higher education. They emphasize the role of educators and policy makers in addressing the challenges posed by policy changes and emerging technologies. In the context of gamification, this translates to developing and implementing policies and practices that support the effective integration of gamification in educational settings. Educators are tasked with designing gamified experiences that align with curriculum goals and learning outcomes, while policy makers are responsible for creating an environment that fosters innovation and supports the adoption of new teaching methods.

Navarro-Espinosa *et al.* (2022) highlights the importance of collaboration and mutual understanding among different stakeholder groups in higher education. The pandemic has not only presented challenges but also opened opportunities for new approaches to educational delivery, including gamification. This situation calls for collaborative efforts among educators, students, and policy makers to develop and implement gamified learning strategies that are effective, equitable, and responsive to the changing educational landscape. Stakeholders must work together to ensure that gamification is used as a tool to enhance learning experiences while addressing the diverse needs of students.

The implications of gamification for stakeholders in higher education are multifaceted. Educators must embrace new pedagogical approaches, students need to adapt to different learning environments, and policy makers should facilitate the integration of innovative teaching methods. The collaborative efforts of all these groups are essential in realizing the full potential of gamification in enhancing the quality and effectiveness of higher education.

4.3.1 The role of educators in implementing gamification

The role of educators in implementing gamification in higher education is pivotal, as they are the primary drivers of integrating innovative teaching strategies into the curriculum. The effectiveness of gamification in enhancing learning outcomes largely depends on how educators design, implement, and manage these gamified elements in their teaching practices.

In the study by Do *et al.* (2023), the comparison between gamified and non-gamified online educational modules for teaching laboratory medicine to medical students underscores the importance of educator involvement in gamification. The study highlights that the success of gamified modules depends not only on the gamification elements themselves but also on how educators incorporate these elements into the learning content. Educators play a crucial role in ensuring that gamification aligns with the learning objectives and enhances the educational experience without overshadowing the core academic content.

The increasing role of technology in teaching and learning activities, as discussed by Burkholder and Krauskopf (2023), further highlights the role of educators in gamification. With the growing integration of technology in education, educators are tasked with incorporating these digital tools, including gamification, into their teaching methods. This integration requires educators to be adept at using technology and understanding how it can be used to enhance learning outcomes effectively.

Educators play a critical role in the successful implementation of gamification in higher education. Their responsibilities include designing gamified learning experiences that align with educational goals, understanding the impact of gaming behaviors on student learning, and integrating technology effectively into their teaching practices. As gamification continues to evolve as a pedagogical tool, the role of educators in navigating this landscape will be crucial for its effective integration into higher education.

4.3.2 Student perspectives and acceptability of gamified learning.

Understanding student perspectives on gamified learning is

essential for its effective implementation in higher education. Recent studies have provided insights into how students perceive gamification and its impact on their learning experience. Stok (2022) delves into the motivational aspects of gamification from a student's perspective. The study compares the pragmatic nature of students, who are often focused on obtaining better grades and improving the organization of their learning process, with the experience-oriented approach of game players. Skok (2022) suggests that to make the learning experience more engaging and effective, educational gamification should incorporate elements that resonate with students' intrinsic motivations, such as fun and engagement. This approach can bridge the gap between the goal-oriented nature of students and the process-oriented nature of games.

The study by Hartline, Conklin, and Dikkers (2022) examines student perceptions in various learning modalities during the COVID-19 pandemic. The findings highlight the importance of instructor connectedness in online learning environments, including those that employ gamification. Students reported lower anxiety levels and a more positive learning experience when they felt a strong connection with their instructors, even in asynchronous classes. This underscores the significance of considering student perspectives in the design and implementation of gamified learning, ensuring that such strategies do not only focus on technological aspects but also foster a sense of connection and support.

From the foregoing, student perspectives and acceptability are key factors in the successful implementation of gamification in higher education. Educators need to consider students' intrinsic motivations, gaming behaviors, and the need for connectedness when designing gamified learning experiences. By aligning gamification strategies with student preferences and ensuring a supportive learning environment, educators can enhance the effectiveness and acceptance of gamified learning approaches. As gamification continues to evolve in educational settings, understanding and responding to student perspectives will be crucial for its continued success and impact.

4.3.3 Policy implications and institutional adoption strategies

The integration of gamification into higher education has significant policy implications and requires strategic institutional adoption to be effective. Recent studies have shed light on how educational institutions can navigate this integration, considering the impact on teaching practices, student learning, and overall institutional policies. Matheos and Cleveland-Innes (2018) mentioned that the role of blended learning, which often includes gamification elements, is highlighted as a catalyst for institutional change. The study suggests that for successful adoption, institutions must develop policies that support the integration of digital pedagogies. This includes providing adequate resources, training for educators, and infrastructure that supports blended learning environments. The study emphasizes that institutional policies should not only focus on the technological aspects but also consider pedagogical innovations to foster a more engaging and effective learning experience.

Skiba (2015) discussed the broader implications of technology trends in higher education, including gamification. The article suggests that educational

institutions need to anticipate and adapt to these emerging technologies by revising their policies and strategies. This includes rethinking traditional teaching methods, investing in new technologies, and preparing educators to integrate these tools into their teaching. The article underscores the need for institutional leadership to be proactive in understanding and implementing these trends to stay relevant and effective in the educational landscape.

Hattie, Sahlberg, & Comer (2023) highlights the shift from conventional learning methodologies to more technologically driven approaches, including gamification. The study points out that institutional policies need to accommodate this shift by providing support for mobile learning applications and other digital tools. This includes developing strategies to ensure that these tools are used effectively to enhance student learning and performance. The study also suggests that institutions should consider the broader implications of these technologies on student study habits and overall academic performance.

The policy implications and institutional adoption strategies of gamification in higher education are multifaceted. Institutions need to develop comprehensive policies that support the integration of gamification and other digital pedagogies. This includes providing resources, training, and infrastructure, as well as revising traditional teaching methods to incorporate these new technologies. Institutional leadership plays a crucial role in understanding and implementing these changes to ensure that gamification and related technologies are used effectively to enhance the quality of education.

5. Conclusions

The study has synthesized key insights into the role and impact of gamification in higher education in the United States. It has highlighted that gamification, when effectively implemented, can significantly enhance student engagement and motivation, leading to improved learning outcomes. The integration of game elements into educational settings has been shown to foster a more interactive and dynamic learning environment. However, the study also underscores the importance of aligning gamification strategies with educational goals and ensuring that they cater to diverse student needs.

Looking ahead, the future landscape of gamification in higher education is poised for growth, marked by technological advancements and evolving pedagogical approaches. The potential for gamification to further integrate with emerging technologies like virtual reality and artificial intelligence presents exciting opportunities for enhancing the educational experience. However, challenges such as ensuring pedagogical effectiveness, addressing diverse learning styles, and maintaining academic rigor amidst engaging game elements remain. The balance between gamification and educational objectives will be crucial in navigating this future landscape.

For educators, the study recommends a focus on designing gamified experiences that are pedagogically sound and aligned with learning outcomes. Educators should also consider continuous professional development to stay abreast of the latest gamification strategies and technologies. For policymakers, the study suggests the development of frameworks and guidelines that support the integration of gamification in educational settings. Policies should

encourage innovation in gamification while ensuring quality and equity in educational practices.

Lastly, gamification in higher education offers a promising avenue for enhancing teaching and learning experiences. However, its successful implementation requires a nuanced understanding of both its potential and limitations. Future research should focus on longitudinal studies to assess the long-term impact of gamification, explore the integration of gamification with emerging technologies, and examine the scalability of gamified learning approaches in diverse educational settings. As the educational landscape continues to evolve, gamification stands as a dynamic and innovative pedagogical tool with the potential to transform learning experiences in higher education.

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