European Online Journal of Natural and Social Sciences 2024;
Vol.13, No 3 pp.259-277
ISSN 1805-3602

Embarking on a Gamified Journey in Higher Education: A Meta-synthesis

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Received for publication: 27 June 2024.
Accepted for publication: 04 September 2024.

Abstract

This meta-synthesis study delved into the role of teachers and their experiences with their students in gamified learning environments in higher education. Twenty two (22) out of 241 research studies from the three open-access academic databases in Publish or Perish software were subjected to a systematic review through inclusion and exclusion criteria. The reviewed academic qualitative research papers were organized using the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 flow diagram. They were analyzed using Braun and Clarke's six-step thematic analysis, which generated ten themes and three meta-themes. This meta-synthesis revealed that teachers can develop gamified learning environments that inspire students and encourage in-depth learning. Moreover, while gamification has a great potential to empower both teachers and students in higher education, some limitations must be addressed to ensure success in learning. Higher education institutions must establish a viable ICT infrastructure to support gamification requirements maximally and for teachers to ensure that gamified activities are directly aligned with the targeted outcomes.

Keywords: Gamification in higher education, Meta-synthesis, Systematic review

Introduction

The superiority of digital technology characterizes the 21st century. The series of technological advancements that are ubiquitous have created a digital society that is constantly changing, with a labor market that seeks adaptable, creative individuals who can reinvent themselves and take the lead in their continuing learning (Longmore et al., 2018). In this regard, the universities set up a practice area to replicate this work environment using active learning techniques that allow for developing the abilities required by the workplace while fostering high-quality technical training (Mora et al., 2020). Learners must be encouraged to seek knowledge by themselves and take action to develop different skills and have positive attitudes towards lifelong learning. Teachers have to design learning environments that motivate learners to learn and exchange their knowledge with one another, giving them opportunities to think, analyze, and criticize what they have experienced. Accordingly, instructors must design the learning to facilitate self-learning, correspond to learners' interests, and comply with real life (Chatwattana, 2021; Boonphak, 2020). The learning designs must also enable learners to solve problems in different scenarios using analysis and synthesis. All of the above are considered the main principles that promote education for learners in the digital age.

Gamification uses game-based mechanisms, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems (Kapp, 2012, cited in Mese & Dursun, 2019). It is also defined as the use of design elements in a non-game context (Deterding et al., 2011) to cre-

ate a "gameful" experience (Hamari et al., 2014). It is a process of making activities more game-like to engage the students in learning (Werbach, 2014). Gamification has been shown to hold considerable potential in educational settings to enhance students' motivation and engagement in the learning task and enjoyment (Hamari et al., 2014). In many ways, the idea of gamifying educational activities chimes well with the writings of the pragmatist John Dewey (1938), who states that a motivation to learn fundamentally begins with the student's curiosity.

According to Seaborn and Fels (2015), gamification is a multidisciplinary concept spanning a range of theoretical and empirical knowledge, technological domains, and platforms. An array of practical motivations drives it. As an interdisciplinary concept, it aims to improve user engagement and motivation by incorporating features and principles of game design into non-gaming environments. It also tries comprehending human motivation and how challenges, incentives, and feedback affect learning and motivation. It takes pedagogical techniques from education to produce immersive, interactive learning environments that encourage deeper comprehension and active engagement. Gamification is a scalable and accessible technology that uses digital tools and platforms to add game features like leaderboards, medals, and points. Furthermore, it demonstrates its broad applicability across other disciplines by leveraging gamified tactics to boost the productivity and engagement of learners. Nevertheless, game technologies create opportunities for higher education institutions to redesign and innovate their e-learning models to support learning experiences among learners (Alhammad & Moreno, 2018).

On the other hand, the inclusion of gaming elements in education may have a different impact on students who dislike games and may experience unfavorable effects (Whitton, 2007). According to Jo et al. (2018), the competitive element that decides a game's winner or loser can hurt learning, and the game's high degree of enjoyment may conflict with the attention and inquiry processes needed for initial learning. Gamification may only sometimes be beneficial because students may eventually grow accustomed to the game elements or find leaderboards, badges, and points to be uninteresting and uncompetitive. Thus, the introduction and increasing expansion of gamification in education and learning contexts promote critical reflection on developing plans that transform students' learning experiences (Garone & Nesteriuk, 2019). While playing games is often seen as a trivial leisure activity, the underlying dynamics of games are the subject of growing interest in different fields and education domains to support student engagement better (Deterding et al., 2011; Hamari et al., 2014).

While several quantitative studies have been published on integrating gamification in teaching in higher education, more meta-synthesis studies are needed to unravel the role of teachers and their experiences with students in the gamified environment in higher education. This academic inquiry attempts to meta-synthesize the experiences of teachers and students in gamifying learning.

1. What are the roles of teachers in a gamified learning environment?
2. What are the positive experiences of teachers and students in gamification?
3. What are the challenges for students and teachers in gamification?
4. What recommendations can be proposed?

Methodology

Research Design

This meta-synthesis study delved into understanding and synthesizing qualitative analysis from different published research manuscripts relevant to gamification in higher education. Accord-

ing to Erwin et al. (2011), a meta-synthesis study is a purposeful and sound method for examining data from various qualitative investigations.

A meta-synthesis is a procedure that helps researchers formulate a precise research question and then locate, evaluate, synthesize, and integrate qualitative evidence to answer questions. This procedure synthesizes prior qualitative investigations using rigorous qualitative methods to create deeper meaning through an interpretive process. However, it is essential to note that meta-synthesis goes beyond summarizing conclusions and findings from qualitative studies. It is a process of reconceptualizing and interpreting to obtain fresh insights beyond those obtained from individual studies that can be created by rethinking the results and then analyzing them (Campbell et al., 2003; Ludvigsen et al., 2016). Nonetheless, meta-syntheses studies may result in theory generation, conceptual model creation, research gap determination, addition to existing knowledge, and provision of evidence to a present state of knowledge. Meta-synthesis facilitates the investigation, characterization, and comprehension of the intricate and diverse aspects of experiences (Atkins et al., 2008).

Search Strategy

This study utilized open-access academic databases such as Google Scholar, Crossref, and OpenAlex to mine the various research articles on gamification in higher education published from 2019-2024. The different data are collected through the Publish or Perish software (Harzing, 2024) using the keywords (a) gamification, (b) higher education, and (c) qualitative study). The relevant articles are downloaded and screened using the Critical Appraisal Skills Programme (CASP) for Qualitative Research for relevance based on the set inclusion and exclusion criteria. Moreover, a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram will organize the extracted data.

Inclusion and Exclusion Criteria

According to Patino and Ferriera (2018), establishing the inclusion and exclusion criteria is a standard and required process for achieving high-quality research. In this study, the research articles which are chosen for inclusion have met the following criteria: (a) the papers are published from 2019-2024; (b) the language used in the paper is English; (c) it should describe the experiences and challenges of teachers and students in gamifying the lessons in higher education (d) the paper is at least cited once. Research studies beyond these criteria were not included.

Data Analysis Procedure

As a qualitative design, this study used Braun & Clarke's (2013), as cited in Bryne's (2022) six-phase analytic process, to develop a solid and reliable synthesis of the research articles pertaining to gamification in higher education. The six phases of thematic analysis included (1) familiarization with the data, (2) generating initial codes, (3) generating themes, (4) reviewing potential themes, (5) defining and naming themes, and (6) producing the report.

Results and Discussion

A total of 2875 studies were identified as relevant based on preliminary identification from three open-access data sources: Google Scholar (N=1000), Open Alex (N=875), and Cross Ref (N=1000). After a thorough reading, 686 research studies were initially included for screening after several studies were removed due to duplication and methodological reasons. Of the 686 research studies subjected to intensive screening, 492 manuscripts were deleted, and around 194 studies were assessed for eligibility. After considering inaccessible papers (N= 93) and excluding studies with not at least one citation (N= 79), only 22 research studies were finally included in the systematic review.

Figure 1 presents the PRISMA flow diagram of the studies included for syntheses.

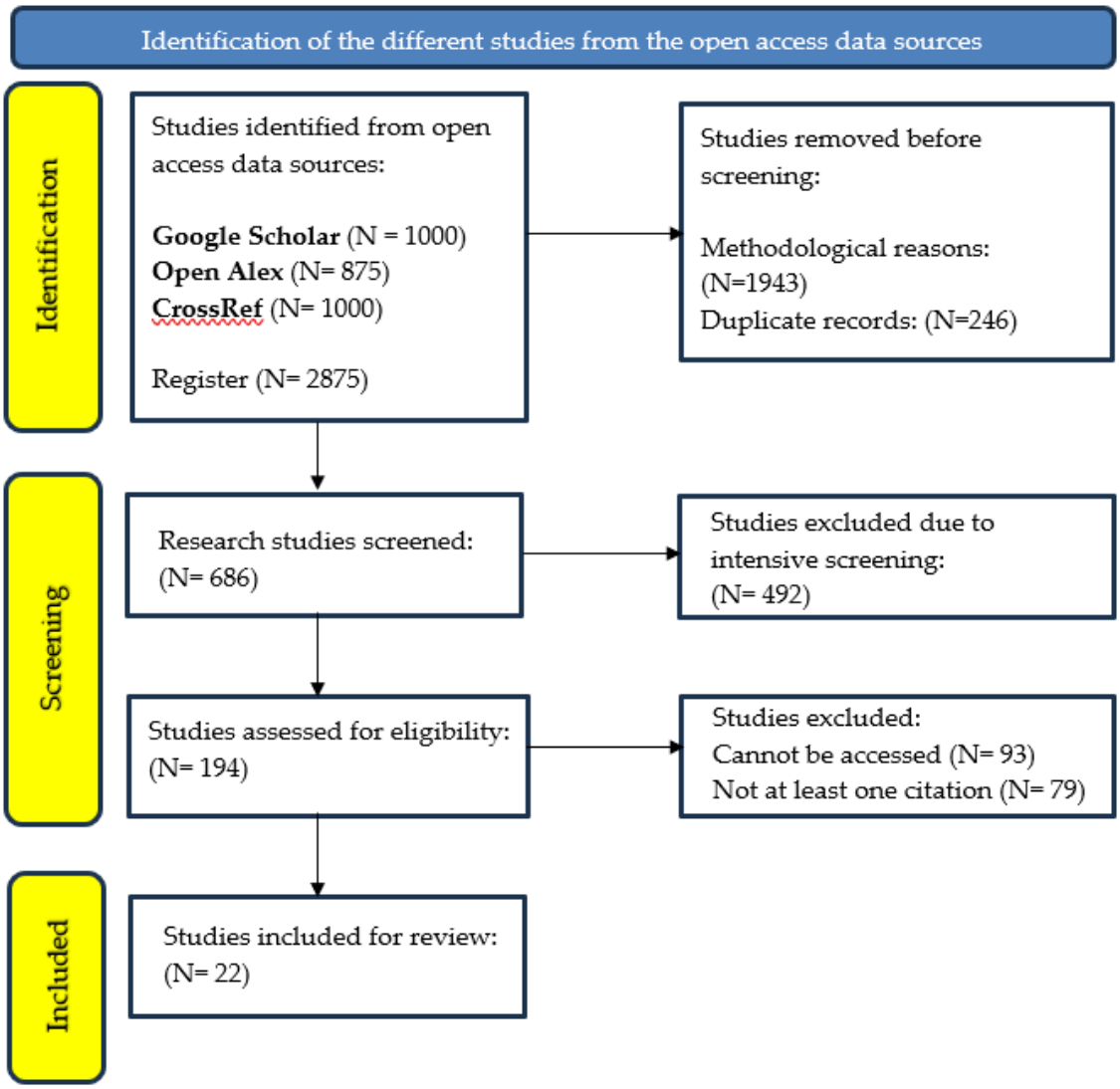

Figure 1. The PRISMA flow diagram of the studies included for syntheses.

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) is used in meta-analysis to ensure clarity, transparency, and completeness in reporting research findings. By providing a standardized checklist and flow diagram, PRISMA helps researchers systematically identify, select, and critically appraise relevant studies, minimizing bias and enhancing reproducibility (Moher et al., 2009). It facilitates the synthesis of evidence by ensuring that all relevant data are considered and the methodology is documented, which aids in the validation and replication of results (Page et al., 2021). Meanwhile, the Critical Appraisal Skills Programme (CASP) for Qualitative Research is used in concept analysis to systematically evaluate qualitative studies' quality and rigor, ensuring the findings' reliability and validity (Long et al., 2022). CASP provides a structured

framework to assess various aspects of qualitative research, including the clarity of the research question, the appropriateness of the methodology, and the robustness of the data analysis, which is essential for drawing accurate and meaningful conclusions in concept analysis (Aveyard & Bradbury-Jones, 2019). Using CASP, researchers can identify potential biases, strengths, and limitations in qualitative studies, thereby enhancing the overall credibility and trustworthiness of the concept analysis (Hannes et al., 2020).

Included Studies

Table 1. Descriptive data of the 22 research studies on teachers' experiences of gamification in higher education

No.	Author	Year	Setting	Experiences of teachers and students in gamification
1	Dehghanzadeh et al.	2019	Iran	• Gamified LESL environments were 'enjoyable,' 'fun,' 'attractive,' 'interactive,' and 'interesting.' • It provides them with an opportunity to get involved in the learning processes psychologically and have a sense of control over actions, progression, and pervasiveness • Teachers curate the learning environment
2	Bouchrika et al.	2019	Algeria	• The teacher checks and regularly monitors students' engagement in the learning process. • Achieves a remarkable level of engagement • Lecturers need to get involved, interact with their students, and start using e-learning technologies. • Older lecturers with high academic positions showed less interest.
3	Safapour et al.	2019	Texas, USA	• Instructor supports learners in in-class exercises and assignments • Instructor promotes critical thinking through designing gamified activities • Increases learning interests • Enhances engagement in the learning process • Increases intrinsic motivation • Improves learning attitudes • Enhances teamwork ability • Improves clear and effective speaking • Improves analytical and critical thinking ability

No.	Author	Year	Setting	Experiences of teachers and students in gamification
				• Enhances planning skills • Enhances creativity • Improves visualizing skills • Improves self-confidence • Improves imagining of real-life situations • Interaction and collaboration of teachers with students are evident in gamified learning setup
4	Jayawardene et al.	2021	Australia	• It is impossible to implement without the proper technological infrastructure in place • Gamification components could be exploited
5	Nurtanto et al.	2021	Indonesia	• Increases in the affective element • Motivates learners to attempt more challenging tasks and develop information literacy skills. • Teachers plan and develop gamification learning methods • Teachers and students collaboratively work through a gamification process to increase student achievement
6	Kalogiannakis et al.	2021	Greece	• Improves motivational outcomes and significant learning results • Provides teachers with immediate and helpful feedback • Allows students and teachers to gather user-specific data that are more thorough and multidimensional during a "non-invasive form" of assessment • Teachers select appropriate game mechanics suited to the gamified environment • Teachers heavily influence the process of gamification in science education • Short-term and immediate effects in terms of learning performance • Problems associated with internet speed and limited computer equipment
7	Sarker et al.	2021	Alberta, Canada	• improves patient outcomes and healthcare delivery by increasing hand hygiene compliance

No.	Author	Year	Setting	Experiences of teachers and students in gamification
				• develops extrinsic motivation in nurses • aides in creating a 'stimulus for learning' through the use of competition and personal challenge • creates uncertainty and doubt on the practical application of the game
8	Zineb et al.	2022	Morocco	• increases engagement, performance, efficiency, motivation
9	Zhang and Hasim	2023	Malaysia	• Improves students' English language skills and abilities • providing an authentic language learning environment • cultivating students' comprehensive competence • prone to technical problems • short-lived positive effect • the negative influence caused by the gamified competition
10	Rahayu et al.	2022	Indonesia	• induces excitement, curiosity, interest, and challenge • feels more enthusiastic • feeling unconfident and confused about using e-learning • triggers unpleasant feelings due to competition and eventually causes a loss of motivation to learn • discourages competent students when game elements become monotonous and repetitive
11	De La Cruz et al.	2022	Peru	• increased student attentiveness to achieving the highest possible score • increased student engagement in the resolution of text comprehension • increased the perception of grammatical learning • reinforces inductive learning,
12	Polat	2023	Turkey	• increased student achievement, goal attainment, and motivation • a helpful strategy for learning • promoted enthusiasm for the content and

No.	Author	Year	Setting	Experiences of teachers and students in gamification
				made students feel excited about the content. • Aroused positive emotions • Different effects of gamification elements on different types of groups or personalities • Little or no increase in scores or indirect impact on grades or outcomes • provides short-term engagement."
13	Gironella	2023	Canada	• made the class feel more relaxed, less stressful, • Periodic congratulatory emails from the course avatar reinforce and reward achievements. • enjoyed the graphics, found the colors exciting, • increased students' sense of autonomy and reduced anxiety by providing freedom to work at their own pace. • promoted a supportive learning environment with a manageable workload
14	Aciron	2022	Spain	• helps build skills by giving a zero-risk practice zone • favors learning by mistakes without embarrassment • transforms monotonous tasks into engaging ones • fosters the development of oral and written language skills • develops students' soft skills. • lacks teacher feedback
15	Regudon et al.	2022	Philippines	• Teachers offer tailor-made courses for the learner • developed relationships through games • Competition in games enhances student motivation and efficiency in the learning process • game experiences give students a sense of belonging • Students increase retention because activities are linked to joyful memories
16	Rahmatul et al.	2023	Indonesia	• lowers anxiety • encourages and motivates student competitiveness.

No.	Author	Year	Setting	Experiences of teachers and students in gamification
				• allow students to evaluate themselves and clarify performance from the instructor • makes learning enjoyable • might boost students' enthusiasm for • studying.
17	Martínez et al.	2023	Spain	• increases student awareness of the potential consequences of economic decisions on society • promotes innovation and the development of healthy teamwork skills • Assists students in better understanding the dynamics and complexities of the microfinance sector. • It helps students to understand better complex and multidimensional concepts such as poverty, inequality, and financial and social inclusion in a developing context. • Helpful in understanding the contents: • Promoting inclusive education
18	Jorge et al.	2022	Spain	• awakens students' interest in the subject. • Favors meaningful learning in students.
19	Yasin Ar	2021	Mexico	• development of innovative didactic experiences • increase students' information retention, motivation to learn, and revisit concepts at their own pace • supports deeper learning • support students' critical thinking development and competency in problem-solving. • advance • learning diagnoses
20	Flores et al.	2021	Mexico	• strategy motivated them to attend class, participate, and carry out the activities, • motivate students under stressful circumstances • leads to behavioral, cognitive, and emotional commitments in synchronous and asynchronous setups.

No.	Author	Year	Setting	Experiences of teachers and students in gamification
21	Sabornido et al.	2022	Philippines	• not all students were fully engaged. • participants find it difficult to follow the steps in the Kahoot quiz • game features impede socialization, generate anxiety, lead to poor learning habits, and impede course completion • some students were not performing well when activities were gamified • could not address the interests of students with different learning styles and levels. • students tend to cheat and procrastinate
22	Imran et al.	2023	Turkey	• develop their design thinking skills • attempt new things and allow them to engage in pleasurable learning experiences. • assists teachers in doing formative assessments to determine which subjects students are struggling with • provide students with a sense of autonomy, competence, and social inclusion • Some students prefer the physical part of learning to online lessons. • Increased anxiety due to time-limited activities • frequent interruption experiences, audio and video errors, a decreased rate of student engagement, student attention span, teacher-student interactions, • Inability to alter secured virtual spaces • gamified testing takes substantially longer than traditional testing • lacks ICT infrastructure, educational quality, digital literacy, and the expense and obsolescence of technology

Data Analysis

Table 1 shows that the 22 research studies under review came from various settings and parts of the world. This implies the universality of gamification since it was coined in 2003 (Cloake, 2023). He further stressed that gamification remains prominent as education grows and has been mainstreamed on different platforms, even in business. The intensive review of the 22 research articles identified 117 significant codes, which were clustered into three meta-themes and 11 sub-

themes. Reflective thematic analysis of Braune and Clarke (2012) was utilized to examine the data. This thematic analysis approach is a flexible interpretative analysis of qualitative data that facilitates the identification of patterns or themes.

The 117 codes were thematically analyzed under the six-step process, which includes (1) familiarization with the data; (2) generating initial codes; (3) generating themes; (4) reviewing potential themes; (5) defining and naming theme; and (6) producing the report *Braune & Clarke, 2013). There were three meta-themes used to cluster the themes. Three themes emerged for the teacher's role, four themes for the gains of using gamification, and another four themes that pertain to the drawbacks of gamification in higher education.

Meta-Theme 1: ***Teacher's roles in a gamified learning environment***

To achieve one of the Sustainable Development Goals (SDG), specifically on attaining quality and equality in higher education, teachers are at the forefront of ensuring transformative learning for the students (Flores-Aguilar et al., 2023). Teachers must adopt new methodological strategies that move the emphasis from the teacher to the students to give them successful experiences that meet their requirements and boost their motivation (Ntoumanis, 2001; Sok Mui, 2019). In addition, Dania (2023) asserted that to foster peer and social interaction; educators should design learning settings where decision-making and problem-solving techniques are applied. The ultimate objective is to develop a gaming environment that makes it more enjoyable for students to play, study, and interact and enables educators to use their careful and caring observational skills along with their emphasis on questioning to encourage players' cooperation and involvement to foster empathy, co-creation, and iteration (Light et al., 2014). Nevertheless, teachers, as gatekeepers of technology integration, must see to it that the gamified experience of the students involves being adaptive, empathetic, and innovative to make learning lasting and enduring (Wu et al., 2023).

Theme 1: Teacher as content curator and designer

According to Sarkar and Roy (2023), content gamification is a relatively new technique to boost student motivation and engagement. The teacher's job is to create a gamified environment that holds the learner's attention and allows for simultaneous instruction through role-playing and additional techniques that appeal to the learner's innate drive to learn. In the study of Sarkar and Roy (2023), they found that curated gamified learning packages significantly enhance achievement and develop the right attitude toward learning. Researchers Garris et al. (2002) also examined teachers' roles in creating gamified instruction. They discovered that student engagement and motivation rose when teachers actively created gamified learning experiences. Moreover, educators could customize the gamified components to match their pupils' unique requirements and learning goals. By using a hands-on approach, teachers could design more customized and compelling learning experiences, which improved student learning outcomes.

Theme 2: Teacher as assessor of progress

As knowledge assessors in a gamified learning environment, teachers are essential icons that propel learning and help learning achieve better outcomes. (Nurnigtias, 2023: Arifin & Setiawan, 2022: Valentová & Brečka, 2023). It has been demonstrated that gamification—integrating game aspects into non-gaming contexts—increases student motivation and engagement in learning assessments. Educational games are one example of a new tool with promising benefits as they may automate the assessment process and give students personalized feedback, saving teachers time.

According to Chaudy and Connolly (2019), although most educators concur that educational games improve student engagement, retention, and learning, only a few are prepared to rely entirely

on them as a tool for evaluation. This lack of trust is probably partly caused by educational games being released as "black boxes," meaning that teachers cannot alter them and that insufficient information is provided about how to play them. They then suggested that a framework be developed that allowed teachers to modify assessments after the evaluation was distributed and view gameplay statistics on a learning analytics dashboard.

Theme 3: Teacher as collaborator and co-creator

In a study by Sheldon (2011), significant findings revealed increased student engagement when educators actively worked with students to build gamified learning opportunities. Students felt a sense of ownership and involvement in the learning activities because of this collaborative process. To add, Sun and Wang (2013) supported this claim by saying that gamified learning experiences co-created by teachers and students have been found to promote better retention of learned material and transfer of knowledge to real-world contexts. By actively engaging in the design process, students develop a deeper understanding of the content and its applicability beyond the classroom.

Meanwhile, Gkogkidis and Dacre (2020) mentioned that it is noteworthy for teachers and students to work together on pedagogical dynamics and foster a sense of collaboration for the development of students' knowledge, skills, and attitudes. In general, this collaborative approach not only enhances the quality of gamified instruction but also ensures that teachers are actively involved in shaping students' learning experiences.

Meta-Theme 2: Gains of using gamification in higher education

Gamification is now widely used in many industries due to its enormous growth in popularity (Huseinović, 2024). Games in higher education have been demonstrated to improve students' speaking, listening, reading, and writing abilities (Zhang and Hasim, 2023).

Furthermore, gamification enhances students' motivation, improving their academic achievement. Moreover, it is anticipated that the use of games in the classroom will continue to develop and result in revolutionary adjustments to curricula, instructional strategies, and learning models (Deterding et al., 2011; Maratou et al., 2023; Limatara et al., 2023). In fact, according to research by Landers and Landers (2014), gamification encourages students to explore, experiment, and solve problems in a setting similar to a game, which, in turn, promotes active learning in higher education. Therefore, it develops soft skills (Aciron,2022) as part of the 21st-century skills. Seaborn and Fels (2015) indicated that gamification helps college students build 21st-century skills, including critical thinking, teamwork, and other abilities that will help them succeed in the workplace.

Theme 1: Enhanced motivation and engagement

According to research, gamification can boost student engagement at work by fostering relatedness, competence, and autonomy. Limantara et al. (2023) suggested that gamification frequently gives users a sense of independence by giving users options, control, and the flexibility to make decisions inside the game environment. People feel more empowered and in charge of their activities and advancement when they have greater independence. Gamification typically includes mechanisms for skill development, progression, and mastery. They incorporate social elements such as collaboration, competition, and community interaction (Safapour et al., 2019; Regudon et al., 2022)

Gamification techniques have a favorable effect on students' academic performance and motivation in educational environments. In a study by Alsadoon (2023), he found that gamification is a valuable tool for increasing student enthusiasm and engagement with the material. This suggests that educators use e-platforms and programs that facilitate gamification when instructing computer

courses. Additionally, because gamification strategies affect the development of motivation and engagement toward learning, it is advised that programs be built in compliance with the theories and principles of gamification design in education.

Theme 2: Improved Learning Outcomes

Through improved student performance and engagement, gamification has been demonstrated to improve learning outcomes (Vanacore, 2023). Integrating gamified features into educational platforms can increase learner engagement, cognitive load reduction, and knowledge acquisition. Research has indicated that when gamification fit is in line with task specifications, learning outcomes might be enhanced (Wang & Kartika Sari,2024: Liu et al., 2023).

On the other hand, this advantage of using gamification found a disagreement, as shown in the research findings of Jarvel et al. (2018). Their study stressed that it provides insights into elements that influence collaborative learning in technology-supported contexts, even if it may not explicitly refute the notion that gamification enhances learning outcomes. The study implies that if other parts of the learning environment, including social interaction dynamics, need to be appropriately handled, the mere presence of gamification elements may not ensure superior outcomes. This is because the study looks at how social regulation affects learning processes. This proved that diversity among students must be considered since learning is not linear, and gamification may have a varying effect on individual learners.

Theme 3: Increased collaboration

According to Sapafour et al. (2023), interaction and collaboration between teachers and students are evident in gamified learning setups. Educators and learners can work together to create gamified learning experiences. During this co-creation process, educators ask students for feedback, consider their interests and preferences, and modify the gamified components to better suit their needs. Teachers can improve student engagement, ownership, and relevance by including students in the planning process. This makes students feel more invested in the learning objectives and activities.

Additionally, research shows that adding gamification to e-learning platforms can enhance student participation in collaborative activities and have a beneficial impact on motivation and learning achievement. Putra et al. (2022) revealed in their study that a gamification system used in online collaborative learning could boost student participation in the collaborative process. Peer-to-peer interaction generally contributes to a rich and dynamic learning environment by improving social cohesion, communication skills, and cooperative learning.

Theme 3: Positive emotional impact

In the book of Werbach & Hunter (2012), gamification in various contexts, including business and education, was cited particularly on how gamification techniques can increase user pleasure and engagement by arousing positive feelings like excitement, curiosity, and accomplishment. It also increases intrinsic motivation and improves learning attitude (Sapafour et al., 2019), increases affective element (Nurtanto et al., 2019), and induces excitement, curiosity, interest, and challenge (Rahayu et al., 2022).

Furthermore, the study by Bais et al. (2020) shows that gamification has a favorable emotional impact on students by reducing anxiety and increasing enjoyment, both of which improve learning outcomes. Another survey by Dehghanzadeh et al. (2019) revealed that environments with gamification were described as fun, enjoyable, attractive, interactive, and engaging. Students can learn from mistakes without facing dire repercussions when gamification is implemented, as seen in

the use of stages and retries. Due to this, traditional exams are less stressful and cause less fear of failing. Also, several gamified settings promote cooperation and teamwork. Collaborating with peers can offer social support, lessening anxiety and loneliness.

Meta-Theme 3: Pitfalls of gamification in higher education

Even though gamification improved learning, educators faced numerous formidable obstacles and hurdles. In fact, during the gamified instruction, students experienced various delays and problems, such as frequent interruptions and video and audio errors. These have decreased students' attention and motivation (Imran et al., 2023), which also led to low performance of some students in gamified activities (Sabornido et al., 2022). Furthermore, Sabornido et al. (2022) revealed that some drawbacks of gamifying learning in higher education include several less engaged learners, incompletion of tasks, compromising academic performance, and persistence of problematic attitudes. These suggest that gamification may not benefit all students and may even have unexpected implications for some, while it can increase motivation and engagement for some. Teachers must carefully weigh these disadvantages and modify gamification techniques to accommodate students' varied requirements and learning preferences. To resolve problems that may emerge and guarantee effective educational outcomes, gamified learning environments also require constant evaluation and improvement.

Theme 1: Equity and accessibility

When implementing gamified training, equity and accessibility are important factors (Micheal et al., 2023). In Vandenbroeck's (2010) study, he mentioned that regardless of gender, gamification can significantly improve student engagement, achievement, and attitude toward learning. However, given that they can affect health risk factors and results, possible drawbacks such as social hardship, economic position, and educational attainment must be addressed.

Sanchez-Mena et al. (2020) study draws attention to the fact that only some students have access to the required technology, which might limit the benefits of gamification and lead to an uneven learning environment. Imran et al. (2022) opined that gamification is a disadvantage when the institution needs ICT infrastructure and obsolete technological support. These create a ripple effect towards educational quality and digital literacy. It adds up the research findings stating that gamification results in a digital divide, which can result in unequal educational opportunities and outcomes (Ng & Nguyen, 2021). Therefore, while gamified instruction offers benefits, ensuring equity and accessibility for all students remains critical to its implementation.

Theme 2: Potential for superficial learning

One of gamified instruction's drawbacks is its potential for superficial learning. Even though gamification has become more prevalent in education due to its beneficial effects, some have critiqued it for maybe only encouraging surface-level participation by trapping students in a reward loop (Misra et al., 2022). Furthermore, studies indicate that superficial gamification, exemplified by sites like Kahoot!, may eventually lower students' levels of intrinsic motivation (Yie, 2023).

Conversely, Greipl et al. (2020) revealed that extensive gamification raises learners' intrinsic motivation, as demonstrated by Classcraft and other platforms. However, there may be a trade-off between motivation and performance since students in shallow gamified contexts have shown higher performance levels than those in deep gamified settings. This emphasizes how crucial it is to comprehend the complex nature of gamification and how it affects students' learning outcomes.

Theme 3: Time and resource intensive

The general acceptance of gamified instruction is hampered by the perception that it requires a lot of time and resources. It is not easy to create very entertaining and instructive games and involves a lot of time, money, and effort (Silva et al., 2018). Furthermore, rigorous planning, development, and evaluation are required to create gamified solutions, which can be difficult for educators who need more tools and expertise (Dicheva et al., 2015).

The design and development process of gamification has been shown to be resource-demanding, resulting in the creation of more general approaches rather than customized ones, despite the potential benefits of gamification in improving student motivation and engagement. Because gamified instruction requires a lot of resources, its implementation may be difficult, particularly in settings with limited funding or experience (Haruna et al., 2021).

Figure 2. The meta-themes and sub-themes generated from the thematic analysis.

Conclusion

Teachers play a crucial part in the gamification of higher education as they create and facilitate engaging learning environments. They possess the power to develop gamified learning environments that motivate students and promote in-depth learning through their roles as content curators, collaborators, designers, and evaluators of students' learning progress. Gamification can improve student achievement and engagement, but drawbacks exist. Sure, Students could find it difficult to fully interact with gamified content, which could result in unfinished academic work and bet-

ter learning outcomes. Teachers may also find it challenging to strike a balance between including game features and learning objectives, which runs the danger of encouraging students to continue having negative attitudes. Despite these difficulties, gamification can transform higher education by empowering instructors and students with careful application and continual improvement.

Recommendations

With the prevalence of gamification in higher education, ensuring the gamified components directly contribute to the course's targeted learning objectives is essential. Teachers must create tasks, tests, and exercises that, rather than adding extraneous information or distracting from the academic material, reaffirm fundamental ideas and abilities. To make students understand the expectations, goals, and guidelines of gamified activities, learning facilitators must clarify instructions on using gamified platforms, accrue points or awards, and recognize how game components relate to their educational objectives. Transparency and clarity boost students' motivation and focus, enabling seamless collaboration and improved social interaction. Furthermore, the institution must ensure that appropriate ICT infrastructure is available to support maximum utilization of gamification requirements. Finally, as students work through gamified tasks and assignments, teachers must provide them with prompt feedback and assistance. Utilizing gamified platforms to monitor development, providing tailored feedback, and pinpointing areas needing improvement would assist learners in achieving success and sustaining motivation throughout the learning processes.

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