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The Effects of Gamification in Education: A Systematic Literature Review

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Abstract: *Gamification has recently been touted as an effective user engagement method with the ability to enhance online education. Even though there has been more research on gamification in recent decades, however, there is still no taxonomy of its concrete impacts. The aim of this study was to fill this gap by identifying the effects that gamification has on both students and teachers engagement in online learning. This study combined a systematic literature review methodology and PRISMA processes to analyze high-quality articles on gamification in education from the last ten years (2012-2022) as extracted from three databases like Scopus, ScienceDirect, and Web of Science. The evaluation and analysis of the 40 articles included in the study summarized and categorized the benefits that the deployment of gamification offered to student engagement, motivation, creativity, and overall performance as well as to teachers as motivation, engagement, or feedback and evaluation. The result of the systematic literature review found that the educational levels that frequently incorporate gaming into their curricula are higher education, but it also shed light on the challenges that come with implementing gamification in the classroom. We hope the study's findings assist educators and students in using gamification as a successful intervention technique by providing them with pertinent information that can influence outcomes and knowledge of the educational content and establish the right conditions for an effective learning process.*

Keywords: *Gamification; e-learning; higher education; platform; student engagement.*

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1. Introduction

There are many good reasons to spend a lot of time playing video games. Games are a part of our daily lives, whether they are played for fun, leisure, or to satiate our competitive urges. These days, game principles are increasingly being used outside of the typical playing setting (Scepanovic et al., 2015). The increased use of technology, including the internet, social media, mobile devices, cellphones, and other tools, has had an impact on higher education institutions' pedagogical procedures (Alzahrani & Alhalafawy, 2022). Gamification is the process of applying game dynamics, psychology, and mechanics to situations and applications that are not games (Rozman & Donath, 2019). Gamification uses behavioural economics, loyalty program design, and game design to create the ideal environment for behavior change and positive results (Rozman & Donath, 2019). E-learning and gamification can be successfully combined. It has one major issue: Due to non-compliance and ignorance of procedures and techniques for the construction of online information systems, many of its implementations fail to meet the desired objectives (Rajsp et al., 2017). Gamification is frequently used in university settings, university students choose the required courses and address student issues (Toimah et al., 2021). Gamification in e-learning refers to a set of techniques and tools that raise interest in and incentive for using and finishing a course in the e-learning environment (Rozman & Donath, 2019).

Keeping students motivated and focused during class had frequently been a challenge for teachers. For this reason, a lot of academic institutions and colleges are looking for ways to keep students engaged, motivated, and interested (Scepanovic et al., 2015). Various techniques have been employed to address this problem including adding elements of games to courses. In order to address educational needs and give students enrolled in these systems incentive chances, the gamification method has been used in numerous teaching systems throughout the world. Because of this, gamification is being used more and more frequently in the world of online learning (Alzahrani & Alhalafawy, 2022). Due to lack of discipline and knowledge of the strategies and procedures for developing online/e-learning data frameworks, many e-learning frameworks fail to meet the ideal objectives (Toimah et al., 2021). Therefore, the purpose of this study is to navigate through prior literature on the effects of gamification in education. Through a systematic literature review, following a thorough review of the literature, efforts are being made to address the following research questions:

RQ1: What are the advantages of gamification in education?

RQ2: What levels of education utilize gamification?

RQ3: What are the difficulties faced in implementing gamification in education?

RQ4: What gamification platforms or tools have been used?

2. Methodology

2.1 Research Design

A Systematic Literature Review (SLR) was conducted in accordance with the recommendations made by Kitchenham and Charters (2007). This recommendation offers a stringent pre-established procedure that directs a researcher through the study process. This thorough procedure detects the biases, errors, and knowledge gaps in the research as well as suggesting the areas where additional study may be advantageous. Researchers find, assess and synthesize all available research related to a specific research question, topic area, or phenomenon of interest through systematic literature reviews (Kitchenham and Charters, 2007). Lamé (2019) summarized the approach to creating a systematic literature review as follows: Formulating a precise review topic, defining the inclusion and exclusion criteria, identifying pertinent research, choosing which studies to add or omit from the study, evaluating the studies' quality, extracting pertinent data, compiling and analyzing the data, and interpreting the findings.

2.2 Search Strategy

A thorough literature search was carried out using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow in three databases, as indicated in Figure 1: Scopus, ScienceDirect, and Web of Science. Only English-language publications over the past ten years between January 2012 and October 2022 were taken into account in this search. ("gamification" OR "gamification" OR "gamifying") AND ("online education" OR "e-learning") AND ("higher education") were the search key terms and search operators utilized.

2.3 Inclusion and exclusion criteria

The inclusion and exclusion criteria were taken into account during the study selection process in order to find pertinent studies that fit the study's scope (Kitchenham & Charters, 2007). Papers have to be published in English and completely accessible in the listed databases, as shown in Table 1, in order to assure a stringent screening procedure. Published research that did not adhere to these requirements were disqualified.

Table 1. Inclusion and exclusion criteria of the study

No.	Inclusion Criterion
1	Articles written in English
2	Articles released between 2012 and 2022
3	Articles that concentrated on gamification with online education or e-learning.
4	Articles examining how gamification is used in online education.
5	Accessible full-text articles.
No.	**Exclusion Criterion**
1	Books, book reviews, editorial materials, conference proceedings, and theses
2	Duplicated studies.
3	It is not possible to download the article's entire text.
4	Articles that do not address the specified research question.
5	Lack of sufficient detail in some articles to address the study's questions.

Source: Author's own conception

2.4 Selection Criteria

500 records were found after searching the databases: 226 from ScienceDirect, 92 from Web of Science, and 182 from Scopus. To ensure that no duplicate records were pulled from the databases prior to screening, the records were examined, and eleven duplicates were discovered and removed. 338 records were removed from the study since it was restricted to open-access records. Records that were not released between 2012 and 2022 were also removed. Another record was removed since its full text was not accessible. Using the inclusion and exclusion criteria, 146 articles were produced; 78 of them were dropped since they had no bearing on the subject. Another 33 papers were excluded because they did not exactly suit the study's parameters. The 34 articles that were left over were kept for additional evaluation and analysis in the results section. The main components of the inclusion and exclusion criteria utilized in the study are listed in Table 1 above. Although a careful process was used to choose the papers that were examined, it is illogical to assume that every aspect of gamification in e-learning was adequately explored. It is also feasible that a search in different databases might have turned up more research in these areas.

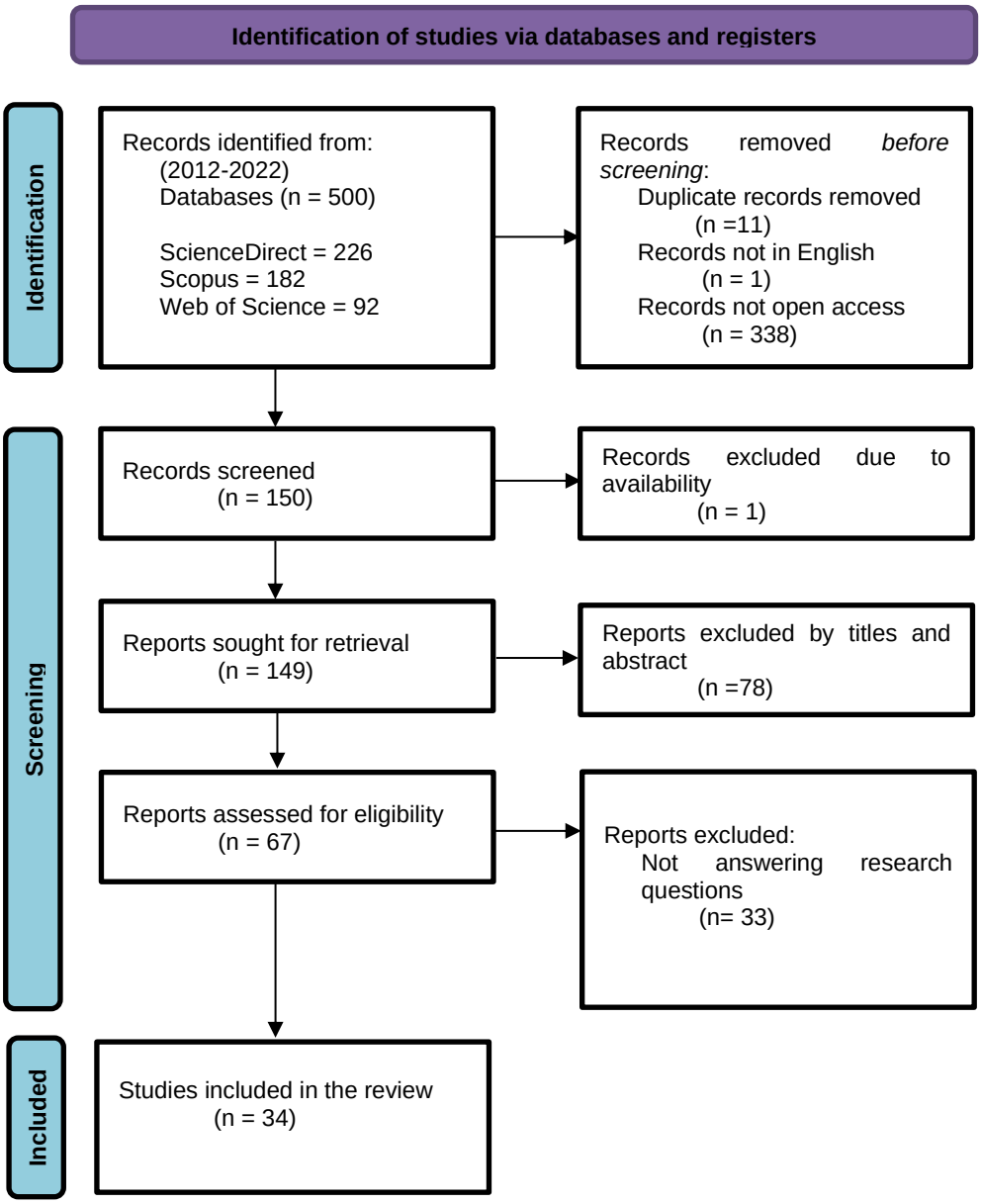


Figure 1: PRISMA flow diagram of the study
Source: Author's own conception

2.5 Data Extraction

The PRISMA methodology data extraction stage, which is the last phase, considered 34 studies. And the following information was taken from the studies:

- Reference
- Study Objectives
- Research Methodology
- Country
- Advantages
- Education Levels
- Challenges
- Gamification Platforms
- Key Findings

3. Results

3.1 Advantages of gamification in higher education

Gamification in e-learning has grown over time, and it has numerous advantages for students at all educational levels. This section of the essay will emphasize the categories of academic improvement, motivation, engagement, control, creativity, and academic performance that result from the adoption of gamification.

3.1.1 Advantages for students

Improvement: One of a student's main objectives is to learn as much as they can in the most convenient way possible, therefore gamification uses ICT to improve student learning and make learning possible anytime, anywhere (Urh et al., 2015). Legaki et al. (2021) noted that levels aid in categorization of information schematically because it is provided in great detail which helps pupils in remembering concepts, while points and challenges provide a sense of accomplishment and growth.

Motivation: For students to learn effectively, they should be motivated to get involved in the education process. Gordon and Brayshaw (2017) pointed out that captivating education, the self-autonomy and flexibility that come with gamification promote self-motivation that is not only about having fun but may also increase engagement. Moreover, using various survey techniques, the gamified application aids researchers in determining how game design components impact learners' motivation, performance, and learning experience (Torio et al., 2020). Furthermore Luis de Marcos-Ortega et al. (2020) described that adopting gamification can lead to social

learning experiences that are more motivating from a motivational standpoint, which can also increase participation as indicated by contributions to the social network, leading to more social engagement and communication that affects individual motivation, facilitates daily activities and makes a user more productive.

Engagement: Effective learning requires student engagement and participation which can be raised by deploying a gamifying teaching process; Bernik et al. (2019) stated that raising student interest and engagement in learning activities offered within a gamified system is the goal of e-learning gamification which leads to provision of superior knowledge assessment results. Hasan et al. (2019) found that students' engagement and learning processes are supported by the utilization of the gamification environment. Moreover, Tavares (2022) stated that studies utilizing a variety of teaching techniques, including quizzes, escape rooms, and serious games, were generally well-liked by students, who supported their extensive use within their curriculum. Finally, Portela (2022) demonstrated that a classroom can be a stimulating setting where students can learn and have fun whether or not it is physically active, and that gamification can be used to encourage student activities, boost engagement, and evaluate their success.

Student-Control: It is very important for students to learn at their own pace; Zafar et al. (2018) said that students can monitor their own comprehension via formative tests, and they can modify their study methods to improve learning. Zafar et al. (2018) indicated that gamifying learning experiences may increase student motivation in addition to formative assessments. Furthermore, Alsulaimani (2022) stated gamification in e-learning helps students become an observer and has control over everything students obtains due to his eagerness to complete each subtask in order to receive its own incentives. It can be said that the design of e-learning activities based on digital inducement encourages tutees to set goals and insight to beginning certain academic assessments and aids them in creating different plans to deal with obstacles. Because obtaining rewards requires careful planning, this is also true. According to research, gamification fosters pupils' creativity, imagination, and enjoyment (Nousiainen et al., 2021). Furthermore, by tackling real-world issues, it enables students to develop their design thinking skills, Additionally, Su and Cheng (2013) claimed that the inclusion of gaming in e-learning platforms motivates students to attempt new things and allows them to engage in pleasurable learning experiences.

3.1.2 Advantages to teachers

Student's evaluation: Gamification assists teachers in doing formative assessments to determine which subject's students are struggling with (Topirceanu, 2017). They can correct learners' misconceptions or strengthen understanding by doing this. Also, focuses on how much a person is self-driven and autonomous, which provides a substantial theoretical foundation for gamification. In order to maintain and encourage users, a gamified system should eventually try to provide them a sense of autonomy, competence, and social inclusion. Tsay et al. (2018) stated that enhancing the effectiveness, strength, and motivation of e-learning, gamification can offer a fun learning environment that can replace the time-consuming learning approach. Students are attracted by games and compensated with knowledge and skill. Gamification in e-learning engages, inspires, motivates, and educates students so they voluntarily accomplish more challenging goals.

Engagement/feedback: Gamification in online learning aids teachers in utilizing personalized and adaptive techniques like testing for estimating student performance, which can be used to customize feedback and content (Gilyazova & Zamoshchanskii, 2020). Through pre- and post-game talks, teachers can assist students and fully engage in the game, appropriately engaging with other gamified teaching and learning environments to reality, helping people understand the information and use their talents in the actual world. Tasks were created to allow students to exhibit individuality and co-create knowledge in order to provide students a sense of relatedness and social involvement. Tsay et al. (2018) argued that a gamification learning system will improve student engagement, motivation, and performance through the successful integration of design principles and student-centered learning. The fundamental goal of e-learning is to increase student-teacher interactions, quick feedback, assignment completion on time, etc. This goal can be achieved by effectively utilizing aspects of gamification, which in turn improve the usefulness of e-learning. Gaining awards and points encourages competition and increases interest. It might be a way to provide a flexible, user-centered learning environment that encourages users to pursue their personal objectives.

Control/Workload reduction: The primary responsibility of the teacher is to facilitate learning, which entails engaging students in the process, providing them the freedom to work at their individual pace, refraining from offering lengthy explanations, and enabling them to participate, communicate, interact, and complete assignments. The most involved party in this process is the student (Topırceanu, 2017). The teacher's role is to support, encourage, and assist students in exploring, attempting, and making

learning enjoyable for themselves rather than teaching. It lessens teachers' workload because they are no longer solely responsible for instructing students; instead, they now behave more like instructors who just direct them on how to study, increasing their interest and drive for learning.

3.2 The educational levels that utilized gamification for e-learning

Figure 2 below shows the distribution of the educational levels in the literature, with 88.89% utilization of gamification for e-learning in higher education. This is because most of the studies focused on university and college students, who are as viewed the main users or beneficiaries of e-learning.

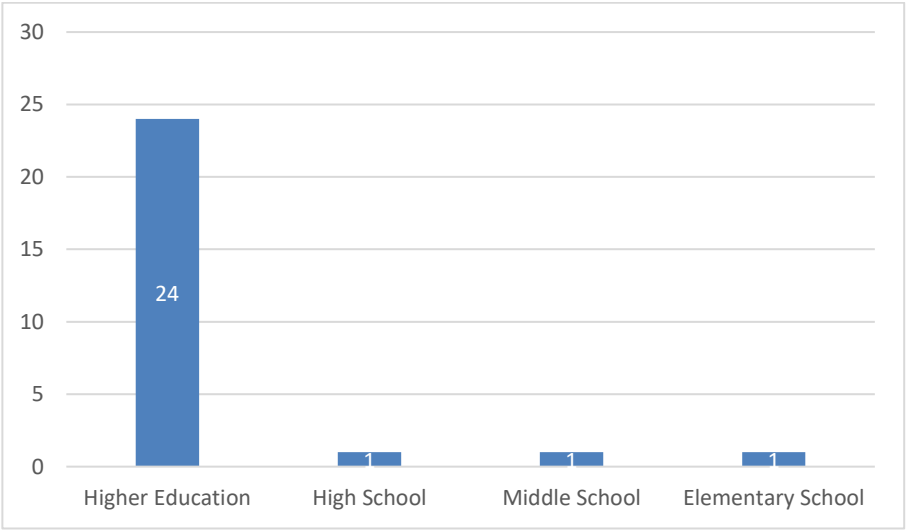


Figure 2: Educational levels utilization of gamification
Source: Author's own conception

3.3 Difficulties faced in implementing gamification for education

3.3.1 Difficulties for students

Motivation: Sumer and Aydin (2022) reported that the length of the course can lead to a decline in motivation of students. In the study by Szabo et.al. (2021), the study found that some students preferred the physical part of learning rather than online lessons.

Engagement: Students that use online learning frequently experience interruptions, audio and video errors, a decreased rate of student engagement, student attention span, teacher-student interactions, and

downloading errors (Aguilos & Fuchs, 2022). Another difficulty faced by students is increased anxiety, Tavares (2022) observed that time-limited activities frequently made students anxious. The improper use of motivational strategies as well as a poorly developed technical and technological e-learning implementation (Urh et al., 2015).

3.3.2 Difficulties for teachers

Failure to achieve teaching goal: The study by Tsay et al. (2018) revealed that all rewards eventually undermine intrinsic motivation. Teaching staff in the educational sector are limited in the ability to utilize new teaching techniques and technological advancements because of the following factors, which can be seen among them: Insufficient time for preparing high-quality materials; Inability to alter secured virtual spaces; unawareness of the benefits of continuing education and career training; teachers failed to consider the factors and benefits that affect motivation of participants in e-courses.

Increased workload: The studies looked at teaching strategies and subjects with higher levels of complexity that demanded greater levels of information skills and critical reasoning, like nursing theory and sophisticated clinical abilities (Tavares, 2022). Due to the additional gamifying aspects, gamified testing takes substantially longer than traditional testing, which is one of the challenges teachers encounter. Integrating games for learning to simulate a real-life learning environment (Severengiz et al., 2020). The Differential Game will result in significant improvements right away, but it will also require some effort to transfer and connect with the other teaching approaches (Pedersen et al., 2016).

Motivation: Portela (2022) expressed that creating an interesting environment and inspiring students are the two biggest challenges in teaching. E-learning technologies for future teachers are on scientists' minds, as pedagogy requires a specialist to constantly adjust to rapidly changing conditions, process new information, introduce pedagogical innovations, etc. Various technologies are being developed to make e-learning more effective (Lytvynov et al., 2022).

Lack of IT infrastructure: Challenges institutions may encounter include ICT infrastructure, educational quality, digital literacy, and the expense and obsolescence of technology (Aguilos & Fuchs, 2022). Bernik et al. (2020) showed that implementing new teaching techniques and technical advancements in the educational sector are limited by the following factors, which can be seen among teaching staff: Lack of time to prepare high-quality materials; inability to alter secured virtual spaces; ignorance of the benefits of continuing education and career training; and lack of authority to

alter secured virtual spaces. Neglecting the benefits and factors that affect e-course participants' motivation When determining the course learning objectives, the teacher's intentions were unclear.

3.4 The gamification tools or platforms

Some of the studies made use of Moodle (Aguilos & Fuchs, 2022; Bernik et.al, 2020; Bernik et.al., 2017; Szegedine Lengyel, 2020), other gamification tools or platforms highlighted in the literature are Coursera, EDX. TechTeach can adjust to various situations, it seeks to improve student participation and use gamification to create a more engaging, enjoyable, and digital learning environment (Portela, 2022). EUR gamified mobile application is a learning tool that students can use to assess their own comprehension and track their academic progress (Zafar et al., 2018). Diffgame is used as a tool for the students to investigate formalistic rules of differentiation, to recognize the patterns of the derivative of functions, it is essential to be able to classify a function from its visual or analytical form (Pedersen et al., 2016). Q learn is a platform that provides assistance to students in creating quiz questions for quizzes, solving quizzes of varying and increasing difficulty that cover topics from the course syllabus, receiving feedback on their answers, monitoring their learning progress, learning from other students who have had similar experiences, and debating particular issues (Şerban & Ioan, 2020). HEgameApp is a tool that aims to help users share knowledge that supports their learning practices. With the use of a Bayesian Markov Model, this tool enables you to determine a student's or a group of students' level of motivation throughout the course of an academic year (Aguiar-Castillo et al., 2022). LogIO is a gamification tool for teaching and understanding the principles of digital logic gates (Torio et al., 2020). MILS (Mobile Insect Learning System) was created and applied in an elementary school scientific curriculum to improve learning outcomes in comparison to non-gamified mobile learning and conventional education by integrating mobile and gamification technology into the botanical learning process (Su & Cheng, 2013).

Table 2: Data extraction table

S/N	Reference	Advantages of gamification in higher Education	The Educational levels that utilized gamification for e-learning	Difficulties faced in implementing gamification for education	The gamification tools or platforms
1	Sumer & Aydin (2022)	Improvement in students' achievement.	Undergraduate	Length of the course, Lack of new tasks, lack of instant feedback. Video detectors, or other sensors.	
2	Bernik et al. (2019)	Raising student interest and engagement in learning activities offered within a gamified system is the goal of e-learning gamification which leads to provision of superior knowledge assessment results.	Higher education		Points, levels, leaderboards, badges, beginner-friendly explanations, social networks, and progressive content disclosure

3	Aguilos & Fuchs (2022)	The direction, speed, timing, and environment of their learning are all more in the students' hands and also allows teachers the chance to conduct tailored courses.		The issues that frequently plague students using online learning include distractions, audio and video errors, a decreased rate of student involvement, student attention span, teacher-student interactions, and downloading errors.	Moodle and plugins like H5P and Level Up are installed
4	Aguiar-Castillo et al. (2022)	Increase in motivation, it optimizes the performance of online lessons.	Higher education	Decrease in motivation.	HEgameApp
5	Torio et al. (2020)	Engrossing instruction, the self-autonomy and adaptability that come with gamification encourage self-motivation that isn't only	Higher Education		LogIO

		about having fun but may also boost engagement.			
6	Bernik et al. (2020)	It affects individual motivation, facilitates daily activities and makes a user more productive.		Lack of time to develop excellent content; incapacity to adjust secured virtual spaces; ignorance of the advantages of ongoing education and career training; and lack of authority to alter secured virtual spaces. ignoring the advantages and elements that have an impact on e-course participants' motivation. The teacher's aims were not obvious while deciding on the course's learning objectives.	Moodle

7	Legaki et al., (2021)	Because the content is presented in great detail, levels assist students recall topics, while points and challenges give them a sense of accomplishment and growth.			
8	Hasan et al. (2019)	Students' engagement and learning processes are supported by the utilization of the gamification environment			
9	Şerban & Ioan, (2020)		Higher Education		Q Learning
10	Alsadoon et al., (2022)	By competing with one another and with each other for points and badges that showed their desire to learn and their happiness with the course, students	Middle School		

		learned while having fun. The instructor saw that the students in the gamification group engaged more, talked to their peers, and used e-learning tools more frequently.			
11	Tsay et al. (2018)	Gamification can assist teachers in creating narratives that involve both formative and summative evaluations of the assessment regime as obstacles to be overcome. It enables students to study in a more adaptable and independent manner.	Higher Education	The research showed that all rewards eventually undermine intrinsic motivation.	Moodle
12	Abdul Wahab & Joy (2017)		Higher Education		E-portfolio

13	Bernik et al. (2017)		Higher Education		
14	Su & Cheng (2013)	Students were able to participate in enjoyable learning experiences, which encourages them to try new things.	Elementary School		MILS (Mobile Insect Learning System)
15	Tavares (2022)	The literature revealed three key themes: game-based learning methodologies, student involvement and experience, and the effects of game-based learning on student learning and knowledge retention.	Higher Education	The majority of research found that game-based learning improved student engagement and learning, while time-limited games frequently make students more anxious.	
16	Portela (2022)	Gamification activities are encouraged to raise student involvement and evaluate their performance.	Higher Education	Motivating pupils in the classroom and establishing an engaging environment are the main challenges of teaching.	TechTeach

17	Reise et al. (2014)	It enhances teamwork, decision-making, and self-confidence.	Higher Education		Moodle
18	Giessen (2015)		Higher Education		
19	Schöbel et al. (2021)	First, it promotes behavior that will lead to learning, and second, include users in learning by using the tools and resources (tutorials, tests, videos, or other digital documents) provided in digital learning.	Higher Education		
20	Tsalapatas et al. (2019)	It enables students to practice design thinking by tackling issues in the actual world.	Higher Education		DesignIT
21	Legaki et al. (2020)		Higher Education		

22	Urh et al. (2015)	It includes information and communication technology that help kids learn better. It makes it possible to learn at any time and from anyplace.	Higher Education	A poorly managed project that ignored the key e-learning development stages (analysis, planning, development, implementation, and evaluation), used the wrong motivational strategies, and did not apply the right technical and technological e-learning implementation.	
23	Szabó et al. (2021)	Using the resources at their disposal, the students study at their own speed.	Higher Education	The students favored the hands-on component of learning.	
24	Topırceanu (2017)		Higher Education		
25	Zafar et al. (2018)	Students are more likely to spend more time learning, learning is more likely to be retained, and learning	Undergraduate		edx and coursera

		is made to look enjoyable.			
26	Nousiainen,et al. (2020)	Understanding the participants' perspectives on the use of game features and looking at this group's user type profile will help us investigate the possibilities of using user types when developing gamification strategies for teachers and students.	Higher education		
27	Luis de Marcos-Ortega et al. (2020)	It helps encourage involvement and promote action	Undergraduate	One of the difficulties faced is that gamified testing takes longer than conventional testing because of the additional gamifying elements.	points, badges, leaderboard

28	Ghai & Tandon (2022)	Gamification can improve the learning environment. This study will motivate instructors and course designers to carefully evaluate an online course's instructional design and gamification.	Higher education		points, badges and awards.
29	Lytvynov et al. (2022)		Tertiary instituiton	Since pedagogy requires an expert to continually adapt to quickly changing situations, process new information, offer pedagogical innovations, etc., future teachers are on scientists' thoughts. To increase the effectiveness of e-learning, numerous technologies are being created.	Moodle and plugins like H5P and Level Up are installed

30	Szegedine & Lengyel (2020)	Due to their experiences, students will feel fulfilled and motivated to learn more.	University		
31	Pedersen et al., (2016)	The training effect might favor students with some modicum of intuition about the math	High School	It stifled those who had to deal with both a new learning format and a task that would have been difficult for them. The DiffGame will yield large immediate gains, but it would also take some work to transfer and align with the other modes of learning.	Diffgame
32	Severengiz et al. (2018)			One of the difficulties teachers have is that gamified testing takes a great deal longer than conventional testing because of the additional gamifying elements.	

33	Gilyazova & Zamoshchanskii, (2020)	It increases interest in learning. It also encourages pupils to actively participate in their learning			
34	Gordon & Brayshaw (2017)	Gamification's self-autonomy and adaptability encourage self-motivation that goes beyond just having fun and might even boost engagement.	Higher Education		

Source: Author's own conception

4. Discussion

This systematic review focused on the effect gamification has in education; gamification is the use of various gaming features and experiences throughout learning processes in the educational setting. In education, student engagement, motivation, creativity, and academic performance are very important, and many researchers use many new technologies and strategies to affect all these positively in which gamification is one of them. Several studies (Topirceanu, 2017; Bernik et al., 2019; Hasan et al., 2019; Portela et al., 2022) highlighted that gamification improves student involvement in learning activities by utilizing a variety of teaching techniques, including tests, escape rooms, and serious games integrated gamification. Furthermore, gamification education platforms help students in terms of motivation to participate in the learning process. As mentioned in the prior literature review researchers (Gordon & Brayshaw, 2017; Torio et al., 2020; Bernik et al., 2020) narrated that for students to learn effectively

when they are motivated which immensely increased with the use of gamification in educational settings. Moreover, the result of this systematic literature review also showed students' creativity should be encouraged in designing an education platform. However, several studies (Su and Cheng, 2013; Topirceanu, 2017; Alsulaimani, 2022; Nousiainen et al., 2021; Gilyazova & Zamoshchanskii, 2020) have highlighted how gamification aids student creativity by developing and implementing several activities that enhance students social behaviors, logical reasoning, critical thinking abilities, the development of cognitive abilities, the improvement of concentration and attention levels, the development of complex thinking and strategic planning abilities, the support of multidisciplinary learning, and the enhancement of motivation for learning. Additionally, Zafar et al. (2018) and Alsulaimani et al. (2022) explained that the overall academic performance of students improved in gamified learning systems because gamification allows students to learn at one's personal momentum, observe, and control learning activities owning it to the fact that they are eager to complete each subtask in order to receive digital incentives. This encourages students to set goals before beginning any educational task and helps them come up with different plans to deal with obstacles. This is also true because achieving rewards necessitates meticulous planning.

Teachers must complete a variety of tasks in order to achieve learning objectives, and this study has been able to pinpoint areas where gamified learning systems have been extremely helpful to teachers, including evaluation, student engagement, workload reduction, control over the learning process, and receiving feedback from the students. One of the main responsibilities of teachers is evaluating their students. Several researchers (Tsaya et al. 2018; Alsadoon et al. 2022) have shown how teachers have been able to use gamified educational systems to do formative assessments and identify which subjects their students are having trouble with. This allows them to correct their students' misconceptions or strengthen their understanding, and because students are drawn in by the fun and rewarded with data and abilities that allow teachers to assess student performance.

Previous researches (Gilyazova & Zamoshchanskii, 2020; Tsay et al., 2018; Topirceanu et al., 2017) have shown how teachers are able to use fixtures that gamification offers such as pre-and post-game talks, ability to relate and measure a game based learning atmosphere to the actual life or reality, ability co-create acquire knowledge and express individuality gamification to increase student engagement and enable them to take part more actively in nearly all learning activities in which teachers are able to accomplish their educational objectives. However, over time, gamification

has been able to lessen teachers' workloads and provide them more control over the Instructional and learning method, enabling them to fulfill the primary responsibility of a teacher, which is to facilitate learning. Topirceanu et al. (2017) have shown how teachers have been able to avoid giving lengthy explanations in favor of using game fixtures that allow students to learn at one's personal momentum and promote engagement, conversation, interaction, and task completion.

Furthermore, Nousiainen et al. (2020) and Gilyazova and Zamoschanskii (2020) have found that gamification in online learning helps teachers use personalized gaming content and adaptive techniques to accomplish teaching goals and allows them to receive feedback by monitoring student progress in the classroom. It also enables teachers to monitor all teamwork and cooperation and see through a thirst for knowledge.

This study has pinpointed a variety of obstacles that students and teachers confront, including technical issues, a lack of infrastructure, the duration of the course, human errors, and time constraints, which frequently prevent teaching and learning goals from being met. Several studies (Sumer & Aydin, 2022; Szabo et al. 2021) have identified a number of technical issues when using gamified educational systems in online learning, including power outages, which are frequent in developing nations, poor internet, audio, video, and downloading errors, which frequently result in a decreased rate of student engagement, a reduction in the amount of time students are able to pay attention, and poor teacher-student interactions. However, lack of infrastructure is another challenge that teachers and students encounter. Aguilos and Fuchs (2022) highlighted that many institutions lack high-quality ICT infrastructure and gamification systems or platforms to effectively carry out the educational process, challenges the institution may face include ICT infrastructure and technological obsolescence. Moreover, since the gamified learning process still requires human intervention, human factors cannot be eliminated. Another challenge observed was the lack of digital literacy among teaching staff, inability to prepare high-quality materials due to lack of time, inability to alter secured virtual spaces due to lack of authority to do so, and ignorance of the advantages of continued education and career training as factors that can all be classified as human error and one of the most challenging aspects of gamified learning. However, due to the fact that most lessons have set or limited times allotted for them, time limits are another obstacle to the deployment of gamified educational systems. According to Bernik et al. (2020) gamification has shown significant improvements when implemented but it also required some effort to

transfer to and align with the other modalities of learning. The added reward features meant that gamified testing took longer than regular testing, and creation of high-quality course material for gamified learning systems exerted more effort.

In future studies, the focus can be turned to finding out how to create e-learning systems that are more successful in accordance with the components and techniques of gamification. Also, further studies can be done on educational methods that can improve students' experience and engagement. Another area that can be studied is the type of teaching methods that can ensure the best learning outcomes for students.

This research, however, is subject to some limitations, the first limitation was the limitation period established by the identified studies. Second, only papers that satisfied the selected inclusion criteria of the authors were included in this evaluation. In this review, the focus was on peer-reviewed studies. Not to mention, the search was restricted to the three selected databases. Expanding the search criteria to cover all scientific databases should be on the future agenda in order to get more comparison results and other types of papers such as conference proceedings, and book chapters can be considered.

5. Conclusion

This article aimed to contribute to the understanding of how gamification affects participants, motivation, and engagement differently depending on their individual personalities. Gamification is applied to educational activities to achieve specific learning objectives, increase students' enthusiasm for completing them, and incorporate them in a fun setting of friendly competition with other students. It can attract learners' interest and help them improve their skills. Therefore, it is essential to prioritize teacher and student feedback in order to maximize gamification's effectiveness. After conducting a literature review on gamification, numerous game-based components which have been employed to create an engaging education have been identified by the studies. However, scientific evaluation of the effects of gamification on learning is still in its infancy, despite the fact that it has grown in popularity. It should be emphasized that gamification has a number of design challenges, and for it to be successful, designers must place special emphasis on the interface of game elements and content relational structure. Globally, there is a significant digital divide in the acceptance of gamification in education, with developing countries not using it compared to the United States, England, Spain, Netherlands, and Germany. Researchers have a good opportunity to focus on figuring out the

primary causes of the gap and the best ways to close it. This systematic literature review demonstrates clearly that there are some limitations that set developing countries apart from developed ones in terms of capabilities. The results of this study help educators and students to use gamification as a successful intervention strategy by giving them relevant information that can impress learning outcomes, increase understanding of learning materials and foster an enabling learning environment.

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