ORIGINAL RESEARCH

Gamification Applications in E-learning: A Literature Review

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Abstract

In recent years, there has been a lot of attention given to the trend of including game elements into non-gaming facilities. The usage of gamification in education is a massive benefit for motivation, user interaction, and social effects. The gamified elements such as points, badge, feedbacks, level, rewards, challenges, etc. have been used in e-learning. A systematic review of gamification in online education has not been found when the relevant literature examined. Therefore, this study aims to research the current literature using gamification and online education and highlight the reported benefits and challenges of gamification applications in online education. The present research followed the literature review method. The current study employed a qualitative approach for collected data. Thus, the term "gamification" was used as the primary research keyword. The results show that gamification has increasingly been accepted as a useful learning tool to generate more engaging educational environments. Additionally, elements support and motivate students to participate in a gamification system. The study showed that the most common gamification elements used in e-learning and have a powerful effect on the students are points, leaderboards, badge, and level. This study is thought to contribute significantly to studies on the use of gamification applications in online education. It reinforces previous studies and identifies many useful study topics that can be explored to advance the field. From these results, suggestions on gamification applications in e-learning for further research are given.

Keywords E-learning · Gamification · Gamification elements · Advantages of gamification · Challenges of gamification

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1 Introduction

The widespread usage of emerging technology, like the web, social media, and mobile phones, influences university educational processes. Facilitating improved collaboration and introducing new computer technologies are beneficial for teaching and training (Urh et al. 2015). Today, teaching in any sector is quite different from 20 years ago (Aloia and Vaporciyan 2019). Internet-based technologies are gaining importance day by day (Uzunboylu and Karagozlu 2017). The web is also a valuable resource for the complement or substitution of formal schooling by students and educators; This approach is e-learning or usage of Web resources to offer a large variety of methods to increase information and efficiency (Aloia and Vaporciyan 2019). E-learning frameworks and internet-based applications became common and enabled users directly to access data on private computers through the internet (Zamfiroiu and Sbora 2014). The e-learning idea has become more popular as the internet is expanding (Karagozlu 2018). Infrastructure is accessible, although typically, the schooling phase is done face to face (Yildirim 2017). Besides, the way professors build and pass on the information, and vice versa is increasingly evolving in technology. Using e-learning tools is ahead steam across almost all schooling (Doumanis et al. 2019).

E-learning has been increasingly common in learning such that a vast number of students access education at a low rate. The majority of learner experiences are rendered accessible online by contemplating previous articles' contents and hence the sharing of knowledge (Ding 2019). Online learning offers students a cultural and individually oriented learning experience without their physical appearance instead of the conventional school framework (Hassan et al. 2019). The main goal of learning and schooling is to enable students to enroll and be energetic in courses (Hanus and Fox 2015). This situation is an incentive to inspire students extraneously because they are not encouraged to learn (Hamari 2017). Incentive schemes are often commonly utilized in classrooms. They intended to promote learning for students (Kyewski and Krämer 2018) as commitment is a term with various meanings clarified by attendance, a desire to take part, or personal consideration. The outcomes are a variety of encounters (between students, teachers, and content). Still, several engagement-definition strategies are also possibly linked to various sides: social, cultural, and not mainly to straight suitable for electronic learning context (Pankiewicz 2016). To enhance the productivity of blended education and dynamic learning, gamification as a modern method will aid. The joining of the curriculum will improve educational processes (Yildirim 2017). In recent years, the quantity of these methods has been enhanced due to the acceptance of the word and its positive outcomes besides an increasing interest in games, particularly in education (Toda et al. 2019). Also, Robson et al. (2015) reported the rise of using gamify technology in different life sectors is for three reasons as follows:

The first reason is that computer games' development and industry have increased during the past years, which takes an enlarged number of studies on understanding, managing, and designing games and individuals' motivations to play. The second reason is the spread of social media, smartphones, websites, etc. It changed companies' participation through engagement, discussion, and re-creation of any experience and expertise. The third reason is that countries' and companies' investigation is exciting new ways to communicate effectively and learn from behavior and influence the users. So, the transfer of instructional materials from traditional to digital formats may create a problem

of lingering since the content component of learning is interactive. Individual students may not be confident or e-learning-friendly (Bachtiar et al. 2018).

Therefore, new teaching approaches implemented in numerous teaching systems worldwide have arisen to address students' educational wants and provide students in areas with distinct atmosphere features and living conditions educational opportunities (Dastjerdi 2016). For this reason, the use of gamification in the field of e-learning is growing and gaining in popularity (Urh et al. 2015). Gamification methods are strategies, procedures, and mechanisms that help consumers consistently determine how to incorporate game basics in an exact non-game setting. The number of gamification styles has risen in the previous years because of the term's prevalence, positive results, and the increasing interest in games, especially for educational purposes (Toda et al. 2019). Gamified is another technique that gains recognition in education (Rodríguez et al. 2018). The possible advantage of gamified learning and education methods has been recommended for a long time (Ding et al. 2018). There are a lot of studies devoted to gamification that studied about gamified elements. Therefore, this study aims to research the current literature using gamification and online education and highlight the reported benefits and challenges of gamification applications in online education. The study designed to find and answer the following questions:

1. What are the purposes of using gamification elements in e-learning?
2. What are the advantages of the gamified education process for students in e-learning?
3. What are the challenges facing the student and instructor in the gamified education in e-learning?
4. Which gamification elements do increase learner's motivation and engage them in e-learning?

1.1 Theoretical Background of Using Gamification in E-Learning

The adoption of innovation through our everyday lives has touched classrooms as teachers utilize modern technical teaching tools. Students may engage in collaborative programs, chat through online groups, view videos in course materials, or use various methods in social media network pages (Sanchez et al. 2020). In recent years, significant improvement has been made in information technology (IT), and school structures cannot overlook such enhancements. IT provides both exposure and flexibility to giant learning atmospheres, focusing on students' variability, promoting inclusive, autonomous, and adaptive learning (Llorens-Largo et al. 2016). But all this transition in education needs intellectual and technical development (Ge 2018). Theories emphasize the need to adjust this strategy to increase students' comprehension. The modern concept of student-centered learning appears central to active learning, known as an educational method that includes the learners' learning cycle (Freeman et al. 2014). In today's environment, many ICT materials are available to make and extend awareness materials cover the internet, radio, TV, smartphone, laptop, computer, and tablet software application and hardware; some ICT devices have educational repercussions (Agrawal and Mittal 2018). Most of this device can be used by each student and lecturer (Vezne 2020). Application software is used to inspire individuals and promote different personally and mutually helpful practices. Maybe the most common development in this field has been splitting with technology, which typically uses design characteristics to encourage motivations in different activities (Hamari et al. 2015; Gokbulut 2020).

Besides, games are increasingly relevant and fascinating as an education resource in various educational settings with the growth of smartphones and interactive technology (Ge 2018). Researchers stated the differences between "gamification" and "game-based learning" and explained that in "game-based learning," students reach their educational goals by playing games. In learning by playing, "playing" often plays an essential role in the learning process. Game-based learning is the use of games to improve the learning experience. However, gamification takes place entirely outside the game context and makes learning more active. Gamification is the process of adding game elements to a non-game situation. Students are rewarded for completing specific tasks (Kim et al. 2009; Al-Azawi et al. 2016; Ceker & Ozdamli 2017). For this reason, the research community has developed a greater interest over gamification (Nacke and Deterding 2017). Gamified is recognized and implemented in diverse areas such as marketing, politics, industry, IT, fitness exercise, and health (Rodríguez et al. 2018). Health researchers and providers have started using gamification apps to deliver medical education online and through mobile apps (Garett and Young 2019). In this sense, many people in the research community have encouraged game-building (Nacke and Deterding 2017). Gamification is structured to incorporate game features to improve human motivation and accomplish individual purposes (Lopez and Tucker 2019). In interactive gaming and digital selling, the concept of using game design features in non-game ways to inspire and improve user activity. And retention quickly; gained in intensity; this is through Gamify (El-Telbany and Elragal 2017; De-Marcos et al. 2014). Many studies defined the technical term "gamification". It is characterized as the mechanism by which game design components are implemented to non-game environments (Bai et al. 2020; Yildirim 2017; Hassan et al. 2019; Kyewski and Krämer 2018; Zainuddin Shujahat and Perera 2020a; Ding Er and Orey 2018; Sailer et al. 2017; El-Telbany and Elragal 2017; De-Marcos et al. 2014).

Moreover, the real world begins to enter game-like and game components to modifying an activity such as a breadboard, a handwriting recognition system, or gaming-like tools (Arnold 2014). The origin of the term gamification is back to the digital media industry. The word is a neologism from the world of new technology. In 2002, it was invented then in 2008, the first document that used gamification was published (Rodrigues et al. 2019). And since 2010, it has become widespread in many fields. Gamification becomes widely accepted in the community of scientific (Bai et al. 2020). Games provide simple goals that are more separated into temporarily easy targets that offer gamers a smooth sense of success by providing incentives that serve as external motivators (De-Marcos et al. 2014). As a result, gamification techniques are used in educational environments to inspire students and, generally, to utilize the competitive need that most people have to encourage successful actions (Rizzardini et al. 2016). In different research areas, the extreme standard game components are points, avatars, challenges, levels, leaderboards/rank, badges (Barata et al. 2017; Hamari and Koivisto 2015; Sailer et al. 2017). Also, feedback, achievements, clear goals, recitations, and pushing (Hamari and Koivisto 2015). Narrative, teams, and progress bar (Sailer et al. 2017). Numerous gamification structures are also possible, like unlocking content, combat, boss fights, gifting, social graph, quests, memes, and certificates (Zainuddin et al. 2020a). In all fields, gamification may encourage beginning or retaining goal-oriented behavior, motivational (Sailer et al. 2017). Furthermore, gamification, due to its impact on student learning, is a growing education phenomenon (da Rocha Seixas et al. 2016; Göksün and Gürsoy 2019). Besides, it is an instructional method to improve teaching, inspire and empower, increase student engagement and interactivity, and encourage learners to grow their skills (Zainuddin et al. 2020b). In the learning process, Ding (2019)

clarified that gamification components encourage learners to gain more goal-orientation through more remarkable patience, repetitive learning, teamwork, and pleasant rivalry with others.

Accordingly, the online learning productive environment may promote communication among faculty members and student, exchange and collaboration between students, time on task, feedback prompt, learning technics active, communicating strong standards, and honoring the variety and learning practices of any student (Urh et al. 2015). The gamification factor was seen with considerable interest in education and improved student engagement in classrooms (Hanus and Fox 2015). It tries to blend encouragement with outward inspiration to promote participation and inspiration (Kyewski and Krämer 2018). Then by encouraging them to take an active part in decision-making, gamification is especially ideal for active learning because it provides students with a healthy and enjoyable atmosphere to explore, create nuanced decisions and think about the consequences of their behavior (Despeisse 2018). Equally important, gamified seeks to incorporate more fun and participation in school, thus offering constructive input that motivates, inspires, and enables students to become more involved. Because encouragement is not a simple job, the gamification interface's effective creation and implementation need significant work (Aldemir et al. 2018). Therefore, the instructional game that is designed well present the continued chance for improvement players, enormous input challenges too challenging to tackle for any person, and communities that shift in reaction to learners' behavior (Urh et al. 2015). However, student involvement will be focused on educational purposes irrespective of whether it is promoted. The students' profile and accessible school facilities must be considered (da Rocha Seixas et al. 2016). As well, Urh et al. (2015) presented the most significant determinants in e-learning are pedagogy, technology, design, administration, people, learning material, finance. Due to technology patterns that encourage the required behavior to use game components and improve enterprise education results. This approach is focused on positive education that exposes the necessity to learn by social contact with the world and colleagues (York and Dehaan 2018). The increasing proof that gamified is widely recognized as a useful teaching tool to construct attractive learning environments (Zainuddin et al. 2020a). The findings of gamified in education focused on observational data from recent research aims at validating the benefits of splitting in favor of its ability to inspire, participate and affect socially while enabling students to immerse themselves in experimental learning (Lopez and Tucker 2019; Zainuddin et al. 2020a). It is necessary to seek to measure the impact of gamified on student education to explain the gamified of teaching. While gamification is common, little consensus exists about enhancing educational outcomes (Bai et al. 2020). Through the literature review, several studies discussed gamification elements. Table 1 summarizes related researches of gamified components in e-learning.

2 Methodology

The present research followed the literature review method to determine the advantages and challenges of gamification applications in e-learning. An analysis of scholarly references on a particular subject is a literature review. It provides an outline of current understanding, such that relevant study hypotheses, approaches, and holes may be established. A literature review includes selecting, assessing, and studying publications pertinent to the research problem like books, articles, and journals (Mccombes 2019). The literature review was a perfect way to present previous literature. It enabled the compilation of research results

Table 1 Recent studies on gamification elements in e-learning

Authors	Aim of the study	Results	Gamification elements	Prevalent themes
Zainuddin et al. (2020b)	Evaluate the effect of gamification on students' success and involvement in a formative evaluation context	To evaluate student output of learning, particularly after completing each subject, the use of creative gamified EQ applications (Quizizz, Socrative, and Spring Learn LMS) and paper quizzes was successful	Badges, points, progressions, memes, certificates, leaderboards, and competition	Perceived engagement and student's performance
Yildirim (2017)	Increasing students' attention and motivation and improve student achievement and attitudes toward lessons	Practices focused on gamification have substantial results on the student's success and attitudes towards learning	Leaderboards, points, levels, and badges	Academical performance
Aldemir et al. (2018)	Examine the overall opinions of students on the different elements of a game training course in the instructor education context	Positive outcomes of story creativity are essential in the positive creation of gamification instruction in the classroom	Narrative, challenge, reward, leaderboards, constrains, teams, points, win-state, and badge	Engagement and motivation, socialization and interaction
Bouchrika et al. (2019)	How Gamified may specifically affect student behavior and e-learning technology interactive content	Gamification may be regarded as a useful method to enable instructional programs to be implemented and improve its interactivity and involvement	Badges, leader boards, and Scores	Interactive and engagement in learning
da Rocha Seixas et al. (2016)	Assess the usefulness of gamification tools as a tool for student engagement in a primary school in 8th grade	The overall output of students earning more rewards from the instructor is significantly better average fulfilments	Badges	Engagement and motivation, socialization and interaction, academic performance
de-Marcos et al. (2016)	How well-developed education and social networking strategies compare with more innovative methods in terms of learning success in undergraduate school	All investigational environments have an essential effect on learning achievement. Social gamification has produced more significant outcomes in terms of learning output through different assessment products	Leaderboards, challenges, narrative, levels, trophies, points, badges	Academical performance

Table 1 (continued)

Authors	Aim of the study	Results	Gamification elements	Prevalent themes
Ding et al. (2018)	The aim is to investigate the effect on student participation in online conversations from the gamification methodology	They were inspired by the gamification method to spend further resources in online discussions. The four-play elements contributed to investment in an additional effort by the students	Experience, badges, points, progress bar, leaderboards rewards, and reaction	Engagement and motivation, socialization and interaction
Ding (2019)	Introduces a mixed gamified approach analysis that encourages the participation of students in online conversations	The gamified strategy has an only beneficial impact on the sum of learners who had more experience of the gamification method, feedback, and participation in online debates	Leaderboards, levels, points, experience, and badges	Engagement and motivation, socialization and interaction
Ge (2018)	Exploring the effect of three award approaches on the success of adolescent e-learners in a gamed education cycle	The findings revealed that the prize-winning model and the price-only model would significantly affect e-learner education than the non-winning method	Rewards prize and points	Learning (motivation, performance, and anxiety)
Gökşün and Gürsoy (2019)	Inspect gamified behavior's effect as an influential evaluation mechanism focused on universal performance and pupil involvement in the teaching environment	Mixed architecture criteria were implemented for the report. The findings of the study showed that academic performance, student participation, community contact model was valuable	Ranking, leaderboards, levels, and points	Motivation and engagement in learning, academic performance
Hassan et al. (2019)	The aim is to increase pupils' success, their inspiration, and their rate of completion using customized elements focused on the types of students' learning	Accordingly, adaptive gamified components and chosen tasks may dramatically increase influences such as encouragement, end of the course, participation, and engagement in the electronic learning program	Feedback, levels, leaderboards, points, badges, and goals	Completing course motivation and interaction

Table 1 (continued)

Authors	Aim of the study	Results	Gamification elements	Prevalent themes
Kyewski and Krämer (2018)	Check that badges awarded in an e-learning curriculum in higher education for good work success and different tasks affect the learner's encouragement and results	Markers have less effect than is generally thought on inspiration and outcomes. Irrespective of their situation, the morale of students declined through time	Badges	Motivation, academic fulfillment, and engagement
Lopez and Tucker (2019)	Explore the connection between the group of players and their game preferences	The category of player is associated with the interpretation and success of person viewpoints in the gamified program	Unlocking content, avatar, and points	Social cooperation, player type, motivation, and performance
Toda et al. (2019)	Recommend a method to support teachers and educators in preparing and applying social media gamification principles in educational contexts	Teachers should use the concept of principles for gamification inside social networks to enhance students' learning environments	Leaderboard, points, levels, badges, achievement progress	Social interaction and connection engagement and motivation
Hamari (2017)	Outcomes of Gamified badge on in a social economy business app operation	Users in the gamified condition were significantly more likely to post trade proposals, carry out transactions, comment on projects, and generally use the service in a new effective method	Badges	User engagement

that dealt with the researcher's topic and uncovering the gaps that have not been addressed and making them among the researcher's priorities for future studies. The current research employed a qualitative approach for collected data. Thus, the term "gamification" was used as the primary research keyword. The present study is limited to review between 2015 and 2020. The research was conducted using the following preferred electronic sources to obtain a global perspective: Google Scholar and IEEE Xplore, Web of Science, Science Direct, and Springer. To find related distributed paper in all databases, the data and information are collected by using the following keywords: Gamification, gamified, gamification element, gamification components, distance learning, distance education, e-learning, online learning. The following Boolean sentence is used in databases and google scholar to find similar studies about the current study subject. (("gamification" OR "gamified") AND ("gamification elements" OR "gamification components") AND ("distance learning" OR "distance education" OR " e-learning" OR "online learning")). Figure 1 illustrated the criteria that have been considered for selecting related articles.

3 Result

This literature review research aimed to find the effects of gamification in e-learning; the following subsection gives details information on review results.

3.1 The Purposes of Using Gamification Elements in E-learning

Integrated e-learning as a new learning form is structured to give students customized opportunities focused on their interests, existing abilities, and styles (Jianu and Vasilateanu 2017). Besides, Hubalovsky, Hubalovska, and Musilek (2019) clarified to motivate the student and supporting them, the online learning elements should respond with the following:

- E-learning content should promote full-time education, and e-learning content will be created to improve the curriculum.
- Online learning activities should stay entertaining, interactive, and should combine images, etc.
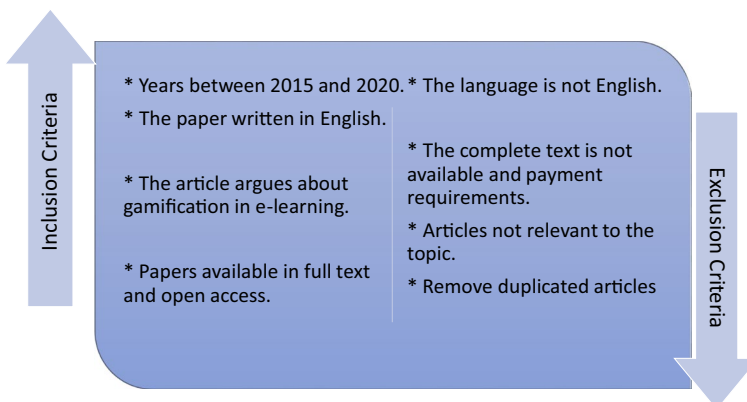

Fig. 1 Inclusion and exclusion criteria

- The activities for e-learning need not be boring but partially steps.
- The gamification components should be used in e-learning activities.
- The complexity of the e-learning activities should be in line with the updated Bloom's taxonomy should be increased from the easiest to the most challenging events.

On the other hand, Jianu and Vasilateanu (2017) reported various possible models for an integrated learning environment domain, group, and adaptive model. Plus, several specific guidelines apply in an adaptive system like receive attention from the user, set goals, remembrance of knowledge, Present learning material, guide the cycle of learning, elicit achievement, supply feedback, evaluate user performance, and improve transfer and retention. Similarly, da Rocha Seixas et al. (2016) noted that student participation in learning practices is attributed to improvements in the implemented framework. The encouragement of teachers, the interactions with peers, the school's arrangement, the fostering of flexibility, and the activities' features all relate to the communication between teachers and the actions proposed. Yet, education technologies will be adjusted and developed to deal faithfully with the growing environment of education and students' next generation (Sanmugam et al., 2016b). As a consequence of the interactive, gamification education framework, as Jianu and Vasilateanu (2017) said that utilizes the latest technology, which allows learning more productive, fun, and engaging.

Furthermore, e-learning has employed the games' mechanisms and features to engage and entertain e-learning (Hassan et al. 2019). Instant input utilizing elements including grades, certificates, ratings, and gamification awards contributes to student dedication to the research process. It enhances their actions towards meeting goals and offers them the ability to chart learning successes and review such accomplishments transparently (Ding 2019). Furthermore, through an instructional environment, the aim of a gamification program may be to enhance awareness by growing students' incentive to engage and revisit class content (Lopez and Tucker 2019; Hassan et al. 2019). Accordingly, in the educational environment, however, gamification is not a commodity in the form of a serious game but rather a mechanism through which game features are used to encourage learner behavior (Bai et al. 2020). Therefore, gamification critics powerfully claimed that the usage of game elements in classrooms or interactive e-learning experiences could improve learning outcomes by inspiring and engaging students (Bouchrika et al. 2019).

Well-designed gamification structures may give learners continuous incentives for random feedback to develop their skills as teaching activities are taught during play. However, a variety of recent research has shown that gamification is not always useful for e-learning (De-Marcos et al. 2014). Its purpose is to improve individuals' participation and encourage other behavior (Urh et al. 2015). Similarly, Pankiewicz (2016) reported putting gamification elements in the e-learning program and examine the impact on student interaction of this implementation. Consequently, the course layout has been revised. The scoring scheme is modified so that points can be obtained every period. Likewise, in educational conditions, gamification enables students to provide instant input and appreciation for their classroom success. It also provides incentives for enhanced student participation and inspiration (Kusuma et al. 2018; Tenório et al. 2016; da Rocha Seixas et al. 2016). An interactive tutorial framework was used to combine the gamification method with a college course. Simultaneously, the authors observed a significant influence on the students' approach's efficiency, encouragement, and information transfer (Ding 2019). Hanus and Fox (2015) discovered that learners in the gamification program showed less satisfaction, motivation, and empowerment than a non-gamified community. Sanchez et al. (2020) proposed using technologies by quizzes in an online learning program offered to students. Learners will

check their awareness of the respective learning module in such self-paced quizzes and provide input on their performances. Besides, Tenório et al. (2016), in the instructional framework of the MeuTutor, a smart tutoring program, has been implemented the gamified peer evaluation model introduced to track student learning in person, ensure consistency of teaching, and enhance their members' results. They were using MeuTutor knowledge from the gamification platform for online learning. Used provisional course details to include customized student assistance. MeuTutor utilizes artificially intelligent technologies to define the students' speed, enabling them to resolve and involve teaching and learning difficulties (Paiva et al. 2016).

3.2 The Advantages of the Gamified Education Process for Student and Instructor

Education is one field in which gamification interest is gaining thrust (Sánchez-Mena et al. 2016). The challenge of getting learners inspired to learn is now more challenging (Smiderle et al. 2020). Ribeiro et al. (2018) believe gamification is a good strategy due to students' relaxed atmosphere engrossed in electronic technology and apparatuses.

3.3 Advantages for Students

The researchers stated that integrating the game components into the online learning environment provides easier achievement of the determined goals, and encourages students and increases their motivation (Jayalath and Esichaikul 2020). Most teachers hope that employing gamification motivates students to learn and makes school participation more successful and positive (de-Marcos et al. 2017). Indeed, the instructor is the learning center, and students are expected to read the text, response questions, and do content assessments (Papp and Theresa 2017). Azmi et al. (2015) state that game elements in education improved student engagement in the conventional classroom and online learning. Incorporating games into the classes emerges from the belief that the games' essence and what allows them enjoyable increases the students' internal enthusiasm to be involved in learning activities. The international study findings on creative teaching and learning confirm that innovative education thrives in educational environments where there is a supportive and positive overall culture (Hamari and Nousiainen 2015). It also assumed that games' intrinsic engagement would increase student participation in the learning process, thus promoting constructive learning, problem-based learning, and experiential learning (Smiderle et al. 2020). The key objectives of gamification are to improve specific skills, set goals that give learning a reason, involve students, maximize learning, promote change in attitude and interact (Krause et al. 2015; Dichev and Dicheva 2017). Popular concepts for gameplay design include dynamic mode, social participation, freedom of choice, liberty to fail, and quick reactions (Dicheva et al. 2015). Thus, gamification is about much more than merely surface-level profits provided by points, badges, level of credibility as it can catalyze behavioral alteration, particularly when combined with the scientific concepts of cyclical learning and guaranteeing to retain (Furdu et al. 2017; Strmečki et al. 2015). Also, it increases the chances of group learning, as it informs the learner about his performance during a challenge or an end state that grows his social involvement. As well as allowing freedom of choice to fail is an incentive for students to re-submit assignments and revisit their homework without penalty; quick notes denote the context that helps students get feedback on their educational performance (Smiderle et al. 2020). Besides, increasing users' self-esteem and inspiration (Urh et al. 2015). According to the researchers' study,

gamification has been recognized as an effective way to improve student learning through several learning approaches (Ge and Ifenthaler 2018; Sánchez-Mena et al. 2016). For instance, Su (2017) used a gamification approach in a geometric arithmetic curriculum and noticed that the students' learning output was boosted. As well as, Ding et al. (2018) suggested that good-designed gamification has significant potential to inspire students to take part in online debate activities. Therefore, the online discussion provides more flexibility for learners and gives them more time to think and reflect to provide accurate content (Huang et al. 2019).

3.4 Advantages for Teachers

Gamification can be a valuable tool to gain knowledge and improve essential capabilities such as decision-making, cooperation, and communication (Dicheva et al. 2015). Also, learn the 21st-century skills and provide an effective and appropriate setting for evaluation, communicating, and engaging in the classroom with their colleagues. Gamification in an education environment improves the relationship between students and the instructor and increases their feeling of inventiveness (Briffa et al. 2020).

Thus, gamification in teaching is considered a thoughtful method to speed up learning, teaching intricate subjects, and systems thinking (Ding et al. 2018). However, gamification is flexible because using it will meet most learning needs, including product sales, client service, soft skills, awareness-building, etc., Which leads to performance gains for institutions (Furdu et al. 2017).

3.5 The Challenges Facing the Student and Instructor in the Gamified Education Process

Despite numerous studies conducted, gamification in education remains a subject of widespread controversy (Smiderle et al. 2020). After integrating gamification into the classroom to improve the results of teaching at various levels, there is still a different indication of the concept of gamification. This is perhaps because of the word (gamification), that is an equivalent game to play, entertaining, unproductive, and fun that is not usually associated with learning. On the other hand, it is wrong to consider gamification as an ideal solution for learners and educators (Papp and Theresa 2017).

3.6 The Challenges Facing the Students

Other studies have shown that employing the gamification elements has failed to improve students' sense of group and have not substantially enhanced students' talents, desire for achievement, and inner inspiration (Mekler et al. 2017; Kyewski and Krämer 2018). Besides, innovative learning through games requires a lot of effort from teachers and students as well. Digital learning in today's knowledge society is characterized by characteristics that are not controlled through time and place (Al-Azawi et al. 2016).

Therefore, it must be considered to find a way to meet each player's needs to ensure a particular game (Briffa et al. 2020). According to Gartner (2015), about 80 percent of all gaming applications will not succeed due to inappropriate design (Urh et al. 2015). In critics' opinion, gamification hinders education by distracting it, the pressure it imposes through unnecessary competition, and possibly a lack of educational needs for some

students (Sánchez-Mena and Martí-Parreño 2017). On the other hand, gamification in the education process does not always mean that students receive sponsorship or participate more than just external motivation, such as virtual rewards or achievement points (Zainuddin et al. 2020).

3.7 The Challenges Facing the Teachers

According to Zainuddin et al. (2020), the leading cause of why learning by the gamified application has been unsuccessful is the use of elements of the game, instructional design, and technical problems. Barriers such as classroom issues and technological infrastructure (for example, non-working computers or power outages and, most importantly, the internet). The faculty hesitated to adopt the gamification elements in their teaching plans because they were not convinced of the concept itself and its capabilities in improving the student's understanding. (Jong et al., 2015). Furthermore, educational designers need to gain an empirical understanding of each of the following: outcomes, learning goals, and content; when assessing individual play selection (Derfler-Rozin and Pitesa 2020).

3.8 Gamification Elements used in E-learning

The gamification principle is based on a self-determination theory that assumes three emotional human desires for social connection, autonomy, and competence (Hassan et al. 2019). These requirements give the learners an essential motivation to improve their capacity; these skills help them maintain further and increase their dedication to educational activities (Hanus and Fox 2015). Accordingly, gamification principles will be based primarily on generating intrinsic incentives in achieving these three criteria (Hassan et al. 2019). Efficient entertainment dynamics and competition features are more likely to bring in gamified as these factors may affect increasing psychological requirements (Aldemir et al. 2018). Years of motivating recreation studies demonstrate that managing individuals as a diverse collective is not ideal for design because tastes and expectations change at the individual (Lopez and Tucker 2019). Gamification game elements can be described as the application of digital game components to user actions in non-game environments; game features are the essential elements of gamification (Sailer et al. (2017). Accordingly, gamification components enhance learners' encouragement by fulfilling their social self-determination and competitiveness needs (Hassan et al. 2019). Besides, Kyewski and Krämer (2018) explain the most significant factors in learning that imaginable is motivation. Motivation is a deciding factor in students' learning that defines how much time and interest they have placed into studying a specific subject (Hassan et al. 2019). However, Denny (2014) proposed that intrinsic and extrinsic are two forms of motivation to humans. With the external motive of a person makes her or his act because of the attraction of a prize or rewards; besides intrinsic motivation, a person tends and prefers to do it for pleasure (Hassan et al. 2019). So, gaming technics are created using resources, strategies, and widgets to gamify an internet platform or device by the person or collaborative usage; motivating users' qualities may be promoted (da Rocha Seixas et al. 2016).

An enjoyable gaming experience involves a modern design for each game (Ding 2019). The idea of gamification allows preparation and studying more engaging and stimulates students to perform more effectively using interactive revenue like badges and achieve a leading location on the boarding (Barata et al. 2017). Additionally, the gamification element is considered to improve inspiration and teaching experience,

interaction, and efficiency among students; the addition of entertainment technicians (for example, leaderboards, levels, and badges) has a positive impact on the involvement of learners (Zainuddin et al. 2020a). Also, Buckley (2017) stated that gamified might be a good motivator. Still, only if employed as a reliable communication technique, the usage of game values as social benefits or bonuses challenges pupils' global encouragement effectively. Ding et al. (2017) determined that the gamification principle has effectively given students significant outward motivation but not internal motivation. All components play a role lead to students' engagement in learning, particularly leaderboard and badge. Several features were also described as desirable online and offline (Sanmugam et al. 2016b).

The concept elements help one discriminate between gamified and challenging games (Sailer et al. 2017). The following are the most common elements used in learning:

- *Points* Designed to award users across multiple measurements and divisions, they may be found within the platform or program to handle specific conducts. If aspects promote a competition, they should not be viewed as outcomes; on the other side, if the goal is to give feedback to a user, each achievement should not be demonstrated to other persons (da Rocha Seixas et al. 2016). Besides, Pankiewicz (2016) states that points allow us to award and punish the unwanted (negative and positive) acts. Points could be increased for individuals who owned points if they complete exercises in the e-learning that developed in gamification (Bachtiar et al. 2018).
- *Badge* Badges are the visual representation of individuals' improvement, e.g., show the degree of competence reached, immediate reviews, and represent one kind of extrinsic award Symbols of development may significantly affect an individual (Kyewski and Krämer 2018). Also, badges as the most frequent game component of the gamification strategy may not help student learning; skillfulness badge based on learners' knowledge of the skill was positively linked to the intrinsic motivation in education. Still, the involved symbol designed to complete the task has a small effect on learners' motivation (Ding 2019). The badges have been used as accomplishment identifiers (Hassan et al. 2019). Above and beyond, markers were identified as cultural symbols to provide social effectiveness in which the performance activities are essential (Hamari 2017). Badges are little signs or symbols given to students for their particular positive works, participation, skill, and achievement (Roosta et al. 2016). Besides, Aldemir et al. (2018), in his study, found that some students liked badge while some said they were not conscious of or interested in symbols. The badge has five codes confidence-booster, fun, self-estimate, feedback, systematic and continuous.
- *Leaderboard* The leaderboard could mention the best students with their prizes, such that their contributions are seen, measured, and recognized (Bouchrika et al. 2019). according to Aldemir et al. (2018). the elements used to show the students ranking and their score is a leaderboard, and it is valuable tools to create competition feeling between students (Roosta et al. 2016). A leaderboard is one of the most commonly used gamified elements; it is securely to say that the usage of leaderboards is a positive move in a gamified teaching setting. The related issues to the leaderboard shown below four symbols teams, competition, participant, and reputation. The leaderboard encouraged social contrast among members more than modularity comparison; the leaderboard may have an opposite effect on the students (Sanmugam et al. 2016b).
- *Level* Show the user performed an aim; levels are commonly known as threshold stages in a manner in which consumer members will automatically level up according to their

sharing (Kyewski and Krämer 2018). At the end of the school year, the next stage of the game is for all who played well (Pankiewicz 2016).

- *Rewards* After an activity, the award is given to replicate this activity; in gamified, the principle of the reward tool is a points system or related ideas (Kyewski and Krämer 2018). When students achieve something and get rewards, the student's motivation increases, and they will repeat the same thing to stay in the current situation and advance into a more suitable condition (Kusuma et al. 2018).

- *Feedback* Feedback as gamified components have different implementations; it may be used to encourage or prevent specific activities, such as CV upload, homework completion on schedule, and forum involvement (Roosta et al. 2016). Also, continuous feedback helps students offer insight into their objectives and follow their success (Hassan et al. 2019).

- *Challenges* Challenges reflect tasks for people to take out and then offer awards for completion, awards, medals/badges, and achievements. The secret to successful responsibilities and expectations is to provide users with a position to show their successes (Kyewski and Krämer 2018). In the gamification, the challenge is essential. Aldemir et al. (2018) stated that symbols are challenging engagement, emotion-arousal, distraction, competitive collaboration, team skills, feedback, reinforcement, self-assessment, collective intelligence, timing, challenge type repetitiveness, and frequency.

As a result, gamified as an essential developmental technique helps teachers get fundamental knowledge of individuals' learning processes (Göksün and Gürsoy 2019). Moreover, utilizing of gamified for evaluation shows the benefits and weaknesses of game design. Gamification applications can be an alternative tool in the assessment process of students (Zainuddin et al. 2020b). As a result, components will support and encourage students who engage in a gamification learning context (Paiva et al. 2016). On the other hand, gamified has been recognized progressively, like an efficient educational procedure utilized to produce attractive learning understandings (Zainuddin et al. 2020a).

4 Discussion

in our future

The results indicate that gamification has positive effects on e-learning processes. The study showed the most-used items in e-learning are points, pages, leaderboard, reward, level, feedback, and challenge, and the finding supports each of the studies (Bachtiar et al. 2018; Ding 2019; Sanmugam et al. 2016b). As well, the study demonstrates the purpose of using gamification in e-learning was to enhance awareness by increasing student motivation to participate and review classroom content (Hassan et al. 2019; Lopez and Tucker 2019) Likewise, to advance learning outcomes by inspiring and engaging students (Bouchrika et al. 2019). The results might suggest that the advantages of gamification in e-learning were to increase communication and give a fun spirit to academic activities (Dicheva et al. 2015). The gamification technique includes challenges and difficulties for both instructors and students. The instructor faces multiple problems when introducing gamified applications in their curriculum, such as classroom issues, infrastructure in the educational process (Jong et al., 2015).

However, based on similar studies' findings, a more reasonable explanation of the elements adopted in e-learning is leaderboard, points, levels, badges, and achievement

progress (Toda et al. 2019). While previous studies focused on the badge feature (Kyewski & Krämer 2018; da Rocha Seixas et al. 2016; Hamari 2017), the study results showed that the purpose of using gamification in e-learning is to include interactive game elements in the learning process (Bouchrika et al. 2019). Simultaneously, Hanus and Fox (2015) discovered that learners in the gamification program showed less satisfaction, motivation, and empowerment than a non-gamified community. In contrast, with provides incentives for enhanced student participation and inspiration in the school. (Kusuma et al. 2018; da Rocha Seixas et al. 2016; Tenório et al. 2016). The researcher mentioned that the advantages of gamification were also improved student engagement and participation in the learning process (Azmi et al. 2015). The researcher explained that the challenge in implementing gamification in the electronic learning environment is.

5 Conclusion and Recommendation

The development of technology and the spread of the internet and smart devices have positively reflected all areas. Especially in education, in this context, many modern technology tools, platforms, and advanced concepts have been harnessed in the curriculum to give education value across the web (distance, synchronize, blended, electronic, or online learning) is a unified concept for web-based learning. As studies have shown, e-learning platforms are advancing actively in almost all stages of the research. Several educational curricula appeared to accompany the technological development. They thus were implemented in many teaching systems to meet students' educational needs and make education available to all. Result of developing computer devices and the web; the principle of gamification has been formed to improve the transforming information and teachers' ideas to the educational curriculum, instead of traditional programming in the classroom. The gameplay elements used to teach learning are points, levels, stages, badges, leaderboards, awards, rewards, progress bars, stories, and comments. Recently, because of its popularity and encouraging outcomes, including growth in media participation, gamification has been embraced. According to studies, gamification can be a valuable tool for gaining knowledge and can improve necessary capabilities such as decision-making, cooperation, and communication. Besides, gamification in education is an additional technique to keep learning entertaining, interactive, and useful. Also, learning the skills of the twenty-first century provides an effective and appropriate environment for assessment. Through the review of studies, gamification's primary goals are indicated in improving specific skills, identifying objectives that motivate learning, engaging students, maximizing learning, and promoting change in attitudes. There is still a different indication of the concept of gamification. According to the studies, gamification in educational activities faces multiple difficulties such as technological infrastructure, Internet service provision, and the intention of both students and teachers to use this tool.

Instructive designers need to develop an innovative idea for each of the educational content, the different student requirements, and the use of appropriate gamification elements. Through the studies that were addressed, the purpose of using gamification in the field of e-learning was to encourage teachers and introduce the playing environment, interact with colleagues, enhance flexibility, and inspire students. Using gamification in the field of e-learning also improves the educational process as well as meet the requirements of the current generation. Consequently, many platforms have been used to carry out gamification activities for students and teachers, such as (Socrative, Edmodo, Kahoot Quizizz,

Mentimeter, Padlet, Flubaroo, Google forms, Edpuzzle). The current study recommends that designers should pay more attention to the scientific content and caution in using the elements of play in the educational process to give the desired result. Also, they should make sure that students understand the rules of the game, the game should be reasonably familiar to most learners, the short duration and simplicity of the game, and the clarity of its laws. As well, encouraging both students and teachers in different levels of education to be familiar with the concept of gamification.

The limitations of this study were to review the literature conducted between 2014 and 2020. Therefore, this study recommended further research to establish an empirical investigation of the most useful elements that are used in gamified online learning. Then the results can be more easily compared and strengthened. In other words; Further research is needed to establish. We also notice that the number of papers published about gamification is somehow focused on explanation and theoretical information. This study is thought to contribute significantly to studies on the use of gamification applications in online education. It reinforces previous studies and identifies many useful study topics that can be explored to advance the field. Also, it contributes to future directions on strategies for gamification in online education for researchers and practitioners.

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