
A Review on Gamification in e-learning: Effects and Challenges

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Abstract: Information technology has brought us a great deal of technological advancement, opening up endless possibilities for distance education. E-Learning platforms make it possible to connect people around the globe. Using the available various technologies, Gamification enhances the performance of e-learning platforms. Gamification of e-learning platforms helps in providing an engaging learning experience for users of all ages. Applying gamification in a non-gaming environment motivates students and also keeps them engaged in learning. This paper summarizes various game elements such as points, leader boards, badges, provided to the users for better e-learning experience by gamifying the environment and discussing the impact of gamification.

Keywords: *e-learning, game dynamics, game mechanics, gamification.*

INTRODUCTION

At present, the concept of child and technology is more like child and digital games. The active and energetic game is now substituted by computer-based technological virtual games. Social games are becoming more popular day by day and with an equal rise in the number of users, which also increased the interest factors in creative teaching tools (Simões et al., 2013). Research conducted by Hazar, Z. (2019) with 177 female and 240 male students suggests that children tend to get more involved in learning through games finishing level by level. The sound and graphical effects present in digital games makes the player get involved and shape their playing motivations.

Gamified Learning platforms keep users engaged by providing them with a well-developed User Experience (UX) and including various game elements like storylines, awards, leaderboards, levels, and experience points. An interesting storyline invokes creativity and decision-making abilities as well as to build a strong personal morale among the learners. Awards, points, and a leaderboard make users competitive and improve themselves in the meantime.

One of the most difficult challenges is to make the student concentrate and have a

non-distracting learning environment. Unlike the student-teacher environment where the teachers are available to monitor them, it is challenging in such online learning platforms. The US Air Force Academy experimented with a software gamification tool with a pleasing environment that offers game rewards to motivate the students to participate. Students also responded positively to the gamified tool (De Freitas et al., 2013).

Game elements can further be improved by creating a personalized environment for every user according to their taste, needs, and values. This can be achieved by using Artificial Intelligence to analyze and classify learners based on their personality and learning style (Zaric and Scepanovic, 2018). Every student has a different personality, and their learning pace and style may vary from person to person. The gamified environments are designed keeping the learners in mind. The major challenge of the gamification of e-learning platforms is to analyze every learner's progress and alter the environment accordingly.

A gamified e-learning platform should keep users from getting disinterested after some time by updating the storyline, adding features and introducing challenges. It should also prove to be better than traditional learning methods. Various game elements have been studied and analyzed here based on E-learning platforms, along with their pros and cons of those.

RESEARCH METHODS

This review paper aims to evaluate the effects and challenges of gamification in e-learning. The paper will examine existing literature on the subject to identify the benefits and limitations of using gamification in e-learning, and the challenges educators and learners face in implementing it. The review will focus on literature reviews that have investigated the use of gamification in e-learning, to provide a comprehensive understanding of its effects.

A comprehensive literature review is crucial to identify relevant sources and extract important data for the review paper. A literature search was conducted using various databases such as Google Scholar, Web of Science, and Scopus. Keywords such as "Gamification," "e-learning," "Effectiveness," "Challenges," "Education," "Learning," etc., were used in the search process. The inclusion criteria for this study is that they are published in peer-reviewed journals, written in English, and conducted empirical studies on the use of gamification in e-learning. Studies that did not meet these criteria were excluded from the review.

This review paper will provide a comprehensive analysis of the effects and challenges of gamification in e-learning. The review will identify the benefits and limitations of gamification, as well as the challenges faced by educators and learners in implementing it. The paper will provide insights into the effectiveness of gamification in e-learning and identify areas for further research.

DISCUSSION

Game Mechanics and Game Dynamics

Game mechanics refers to how learners engage in gamification, their achievements, progression, and future goals. It gives the user interest and motivates them. Game mechanics are a diverse set of mechanisms, actions and controls used to gamify the activities (Bunchball, 2010). Game mechanics are points, levels, challenges, leaderboard.

Game dynamics are observed to be the behavioral patterns that are found in game

mechanics (Liu & Tanaka, 2020). Game elements such as points, quests, levels, badges, and leader boards concerned with the interaction between the concrete game mechanics and the users at a more abstract level are termed as game dynamics. For instance, different challenges might be set up for the users based on their levels namely beginner, intermediate, expert and the points will also vary accordingly. In this case, game dynamics and game mechanics motivate the e-learners.

Game Design and Game Elements

Game Design

The main aim of gamifying is to motivate the users to learn and provide them with the necessary content simultaneously. The game design should focus on providing goal-based activities, points/rewards mechanisms, interesting challenges and progress tracking. The Gamification process can be divided into five phases: Content creation, design, development, deployment and post-deployment (Strmecki, Bernik & Radosevic, 2015).

Content creation is the skeleton of the learning platform. It requires expert knowledge of the subject. Necessary videos, audio, study materials and questions related to the subject are collected from the experts. The collected content is then presented to the users in a personalized format.

The design phase involves drafting the platform with an engaging user interface and user experience. Attractive graphics and animations are bait to lure new users and provide them with engaging learning experiences. The platform can be designed to include storylines and various game elements. The design should also be flexible so that some game elements are optional and also provide a facility for users to customize their environment. The game elements should be designed so that it is not too competitive (Strmecki, Bernik and Radosevic, 2015) as that would prevent the user from achieving their true goal, learning.

After designing process, the platform is developed using various programming languages and every process is documented. The visual and sound effects are added. Artificial intelligence and machine learning models are implemented to create an interactive environment as well as to analyze user behavior. Then the platform is put to the test and bugs are fixed. After testing, the platform is deployed and distributed among the public.

Once the platform is deployed, it is a good practice to release fresh content/challenges frequently and update the platform with new features occasionally. It is important to provide customer service which helps in identify and fix bugs.

Game elements

E-Learning environment design provides optimal support for different users to improve an engaging learning experience. Dichev's gamification study mainly aims at the use of game elements and at how all game elements are linked to the behavior, motivation and education of the learner (Dichev et al., 2017). There are some important aspects which can be used as game design elements.

- **Points:** The point system in e-learning is defined as the measure of learning achievement or simply the success rate of the user. These points are to be used as a reward and a motivation for the user's learning progress (O'Donovan et al., 2013). The points earned by the user may vary, or it can be said that the user would be awarded points for various reasons. For instance, a user might be awarded certain points for passing a particular level (Level-up score) or bonus points can be rewarded for clearing the recap test or any code challenge in the very first attempt

(bonus score) (Chapman et al., 2017).

- Badges: Badges are awarded to mark the user's accomplishment. For instance, a digital badge system was implemented in which students gain badges through afterschool programs and it was observed that it showed one's credibility to earn badges (Davis, K., and Singh, S., 2015). It can be considered as a mark of appreciation for finishing his or her tasks. Regarding the review provided by (Gibson et al., 2015; Kumar & Khurana 2012; Nah et al., 2014), explains the necessity of badges in the gamification of E-learning platforms. Badges used in such platforms can motivate learners to improve their performance and achieve their goals on time. It was also considered as a way to create competitiveness among users. Similarly, Kumar & Kharuna (2012) figured out that students showed less interest towards traditional classroom learning methods, this was eradicated with the help of gamification brought in those platforms where students were motivated because of the scaling points and badges awarded after completion of one's tasks.
- Leader boards: Gamers always like to break any challenge put in front of them. One such idea in gamified e-learning platforms is leaderboards. It enables the learners to see where they stand on the basis of their learning or the tasks finished by them. The urge to compete motivates the user to try harder until he/she ranks high in the leaderboards and is a means of signalling goal attainment. The leader board displays the top score and the individual user scores as well. Generally, it is used to display only the top scorers, and does not demotivate those who scored less. From the survey conducted by O'Donovon et al., (2013) leader boards are considered as the highest level of motivation for e-learners. Another experiment on gamifying an ICT course (Çakıroğlu et al., 2017) in which only the best five students were assigned to the leaderboard and it improved the competitiveness among the learners.
- Peer Groups: When we lack motivation, peer support is much needed in that case. Peer groups and peer support can be experienced easily in a real classroom compared to an e-learning platform. This can be achieved using various text channels where chat groups can be created in order to solve someone's doubts or let's say there are users with similar interests and ideas, then they can have a separate discussion channel in order to support each other's goals and motivate them. One such interactive community is Stack Overflow (Armstrong, 2013) where programmers interact with different communities. The users who answer queries posted by other programmers will be given certain rewards to appreciate their answers and the most appropriate answers would be voted up.
- Challenges and Hidden Test Cases: The challenges put forward to the user bring a sense of achievement after the fulfillment of the challenge. In an E-learning platform, a short review test or level-up test can be conducted (in order to move on to the next level), the user might have to undergo a test which can be termed as "End Level Challenge". In case of an e-learning platform that teaches programming, there can be several hidden test cases and suppose certain hidden test cases did not pass, then we deduct a set of points from the user in order to reveal the hidden test case. This motivates the user to try it several times instead of losing the points earned. Time restrictions can also be included in the challenges, countdown clocks can be used so that the user needs to finish a certain task within the stipulated time and the points maybe awarded for those who finished ahead of time (Rutkauskiene et al., 2016).
- Progress Bars: Researchers have utilized progress bars in the gamification of e-learning platforms. Badges in gamification are used to demonstrate the attainment

of a particular level or the goal set by the user whereas progress bars are used to measure the overall goal of the user. The user can also set a target, like the time limit to finish learning a particular section or topics, similar to deadlines. Progress bars are really useful as they encourage the user if they are behind deadlines.

- **Storyline:** Storyline is the story in the game. A good storyline helps the learners to achieve an ideal interest curve and helps them to stay motivated throughout the learning process. For instance, Anatomy classes can be taught as a story with the help of Augmented Reality where the users will get a live experience of the demonstrations. AR gamification can increase the use and adoption of learning management tools, it enhances the learner's engagement and ensures dedicated learning (Liu & Tanaka, 2020).
- **Levels:** The learner might have to finish a set of tasks in order to level-up. Multiple stages are set to motivate the learner. Sometimes levels can be named as beginner, intermediate, expert. The tasks or the challenges in each level may vary depending on the difficulty level. Levels are used to show the progress of the learner.
- **Avatars:** Avatars are reflective of users in which they reflect their goals, weaknesses, and various roles in life. As expressions of their autonomous demands, players must choose or build avatars.

Gamification and Its Effects

Gamification is applied to almost all learning platforms in order to grab the user's attention. It is presented as the most efficient strategy to user engagement and it is also important to understand the various effects caused by the gamified platforms on the user. It is important to understand that the requirement of employers has changed. Companies today want more flexible people with various skills. A study was conducted based on how gamification affects the student's thought of self-directed learning (Pacheco et al., 2020). It is also important for the people to develop the capability to learn new skills which drastically results in self-development.

Adaptive Gamification in E-Learning

Gamified platforms are booming but the real question is if the users are really adapting themselves into such platforms. According to the experiments conducted by Lavoué et al., (2018); it was assumed that only those who adapt to the gamified platforms will spend a lot of time. The volunteers for this experiment were between the ages of 18 and 75, who were divided into three groups namely AF - volunteers adapted gaming features; CF - Counter Adapted gaming features; NF - volunteers had no gaming features. This experiment had promising results and it was concluded that the group members of Counter adapted (CF) features have the least motivation.

At times, several dropouts can be found in e-learning because of the lack of motivation among the students. Students have different learning styles, gamified elements need to be more personalized and this helps in developing self-motivation among the users (Hassan et al., 2021). To address this issue, different models have been developed which identify the learning styles of the user based on their interaction with the gamified platform. The result concluded that the motivation of learners increased by 25% (Hassan et al., 2021) and they also seemed to be engaged and active participants. Different environments have come up with different gamification elements to motivate and engage students (Tomé Klock, et al., 2015). It can also be seen that the platforms with most game elements have the most active users.

Gamification vs Dropout in E-Learning

The high dropout rates in e-learning platforms could be a very big problem. It can be prevented if we know the reason behind these dropouts. The research based on understanding the e-dropouts (Aydin et al., 2019) identified various factors like extrinsic motivation, short classes, problems with technology, attraction, lack of learner control of content, poorly designed courses and so on. Clearly motivation is an important factor and also learner's satisfaction with e-learning. Studies show that student's satisfaction is closely related to student's decision to dropouts in e-learning (Levy, 2007).

Sometimes the older e-learning students tend to be more comfortable with the environment than the beginners, it mainly depends on the visual treat. It can also be observed that the student dropout rates are higher in e-learning than the traditional classroom education (Lykourantzou et al., 2009). The various reasons behind this can be the higher educational cost in classrooms than e-learning platforms, learn anytime feature in online learning which makes the learners procrastinate their daily goal.

Effects of Gamification in Collaborative Learning and Engagement

Collaborative learning and peer group support has attracted students and resulted in motivating students to be more active in online learning platforms. Experiments were conducted by Cen Li, Dong, to observe the effects of collaborative learning and engagement in e-learning (Li et al., 2013). The platform created for this experiment had various features like peer code review, self-quiz, group exercises, built in discussion forums and chat systems. When compared to the traditional learning and this platform, the results were remarkable. Students were engaged in e-learning whereas, students seemed to be diverted in traditional learning. Students who got more rewards or points from the teacher had better average performance (da Rocha Seixas et al., 2016). Another research by Ahmad on the learning outcomes of computer science majors (Ahmad Zeshan et al., 2020) examines the various effects of gamification on higher educational level. The experiment mainly focuses on different control groups in which students were divided into group of 7 students, 24 students and no group. The result showed that the satisfaction in the group of 24 students is correlated to student's individual performance.

Effects of Gamification in Students' Motivation

Elevating motivation is one of the main principles for efficient learning. Intrinsic motivation reveals the learner's interest, capabilities, and knowledge. The study conducted by Harandi, (2015) shows the relationship between student motivation and e-learning. If students are motivated, then they are engaged in learning. The learner's motivation and the applications need to match. The E-learning website needs to consider learner's perspective and also make the learners as a part of the development process (Abou El-Seoud et al., 2014). One of the key points is to capture the learner's attention and this can be achieved through various ideas like, using interesting images or animation, concentrating on the main content instead and using up to date contents. These ideas could easily boost the confidence of the learner along with the various game elements (Abou El-Seoud et al., 2014) like leaderboards, points or levels.

By providing feedback or using badges to reward learners and we can recognize their achievements which brings satisfaction in them. Similarly, peer groups can also improve the learner's motivation. We must have a keen attention on the environment and frequent change in the design will generate a greater impact on motivation (Apostol et al., 2013). The sub split analysis shows that the efforts of competition along with collaboration might also be valid for motivational learning outcomes (Sailer et al., 2020). Motivation was examined from Self-Determination Theory (SDT), as gamified approaches rely on external

motivation. Experiment conducted by Pilkington shows that a playful approach might have positive motivational effects (Pilkington, C., 2018).

Effects of Gamification in Students' Success and Competence

Gamifying a learning environment has proven to have positive effects on student learning as well as helping them succeed. Gamifying platforms serves as a place where students can work on their mistakes by restarting/replaying the game. This helps students to learn without the fear of failure. Gamified platform integrated with social networks provides competitive e-learning experience which fuels student's motivation to learn and succeed (Domínguez et al., 2013). A meta-analysis of 46 experimental studies showed that gamified learning improved learner's achievement compared to traditional learning as it provides flexible learning for learners based on their capabilities. This study also shows that serious games integrated with social networking improves learner's social interaction leading to academic success of the learner (Karakoç et al., 2020). Another Study based on challenge-based gamification on learning also shows that groups who had challenge-based gamification had higher performance and their success rates were high compared to the groups who followed traditional or lecture based learning or reading papers (Legaki et al., 2020). Another promising result shows that the gamified framework in student's curriculum improves student's motivation, academic achievement and attitudes towards lessons (Yildirim et al., 2017).

Effects of Gamification in Student's Learning Style and Culture

To make a successful e-learning platform, we need to provide personalized learning experience to the learners to help them learn from their mistakes and also feel a sense of ownership. This is a challenge because each learner has a different learning style and behavior.

A study was conducted at Faculty of Information Technology, University "Mediterranean" Podgorica to analyze the effects of different game elements on students with different learning styles. In this study Felder-Silverman Learning Style Model (FSLSM) (Felder & Silverman, 1988) identifies different learning style of the students and the students are split into two groups A (Experimental) and B (Control Group) with equal number of students of different learning styles. The e-learning course was developed with different game elements such as badges, levels and experience points, progress track, leaderboards and mystery. The data for the test were collected for each group of students which included their scores from questionnaire, results of pre-knowledge test and results of e-learning and self-examination knowledge tests. The result of the study given after the comparative analysis between both the group shows that various game elements have negligible impact on students with different learning styles (Zaric and Scepanovic, 2018)

Gamification in STEM

The demand for students studying STEM subjects (Science, Technology, Engineering, and Mathematics) is seen to be increasing in the 21st century. This raises the necessity to provide strong education to students pursuing STEM. Students are driven away from studying STEM due to misconceptions that STEM is hard to study and has low employability (Playfoot, 2016). Gamified STEM learning platforms can be used to attract students and increase the effectiveness of teaching the STEM subjects. The Newton Project, funded by the Horizon 2020 program, focuses in developing technology-enhanced teaching and learning methods using gamification across Europe.

The Newton project shows us that gamification provides a great opportunity to create an e-learning platform to attract students into STEM and enhance teaching and

learning of STEM subjects (Playfoot, 2016).

Gamification in Assessment of Programming Assignments

In learning Computer Science, it is important to enhance one's programming and problem-solving skills. Students need to overcome their learning difficulties from entry-level to advanced computer programming and prepare for real-world work environment (Pedrosa et al., 2016). Automated assessment of the programs helps in evaluating a student's programming skills and also teach students to upgrade their algorithmic problem-solving skills. Integrating the automated assessment of programs with game elements such as badges, experience points, leaderboards etc. promotes student engagement and peer competition. To provide personalized response to a student, various factors such as learning style, cognitive skills, etc. are to be considered. One such study that targeted at learning C-programming language. The results show positive effects on the engagement of students towards gamified learning activities and a reasonable improvement in their courses (Ibanez et al., 2014). Another article based on having medals as a part of a peer rating system - study group on Python programming language, suggests that the peer rating system helps the participants rate what is important or more valuable and it's a form of recognition. (Ponti, M. 2015).

Automated assessment and gamified platform, 2TSW, proposed by Polito, G., & Temperini, M. (2018) aims to provide a responsive, personalized and dynamic interactive environment. The platform was simulated to be tested with artificial students modeled by attitude and competence. This simulation showed that the platform was able to analyze student behavior and change its model accordingly (Polito and Temperini, 2018).

Gamification in MOOCs

Table 1. MOOC platform and game elements used

WEBSITE NAME	LINK	GAME ELEMENTS
Khan Academy (Morrison, and DiSalvo, 2014)	https://www.khanacademy.org/	Avatars, Badges
Coursera (Vaibhav and Gupta, 2014)	https://www.coursera.org/	Timeline, quick tests, Scores, deadlines
W3schools	https://www.w3schools.com/	Certificates, tasks
TedEd (Frانيا, 2014)	https://ed.ted.com/	Video learning
Code academy	https://www.codecademy.com/	Visual Ui, Focus timers, progress bars
Udemy (Kučak et al., 2021)	https://www.udemy.com/	Progress bars
Stack overflow (Armstrong, 2013)	https://www.stackoverflow.com	Peer groups, points
Leet code	https://leetcode.com/	Points, ranking, social discussion forum, challenges

MOOCs (Massive Open Online Course) are online courses which have active participants and have a significant contribution to individual delegation of power as they help people learn a variety of topics (Aparicio et al., 2019). Online learning has become everyone's priority, from researching on how it works to currently in action and is already

changing the global education (Loeckz, J. 2016). Some learning websites still follow the traditional method of teaching, which has a typical classroom set up and the lecture is blindly recorded. It has been several years since the outburst of video games in both kids and adults (Oriol et al., 2014). Let us also take a look at the various Massive Open Online Courses (MOOC) platforms available and its effect on the user. Taking this as an advantage, various developers have implemented the Gamified MOOC websites. Table 1 shows MOOC platform and game elements used.

Social Gamified Network in E-Learning

The experiment conducted with 379 students in Spain (de-Marcos et al., 2016), in which students were divided into five groups - Control groups, educational games, Gamification plugin, Social Networking website, Social Gamified networking website. This experiment shows that gamified and social gamified network modules increase student learning performance. The social network and social gamified network act as a platform for students to connect with their peer group and collaborate with each other.

Recently, flipped learning has attracted a lot of educators. It is proven that students learn more effectively during the class by doing small group activities and providing lecture materials that could be seen after class hours. The results show that students in gamification-enhanced flipped learning groups complete the activities on time more than those in non-gamified flipped learning. This shows that combining gamified plugin with social network-based learning boosts learning motivation and student performance.

Limitations Of Gamification

- **Decreased Student Attention Span:** The fast speed and immediate feedback cause an issue with student attention span. Students would automatically expect the same kind of reaction from all sections of their education and will not receive it, leading to frustration. Another study focuses on how a gamified Information System (IS) in the workplace engages users and encourages them to continue using the system. Flow experience (FE) and Aesthetic Experience (AE) are two concerning topics. AE is more salient than FE in explaining continuance intention (Suh et al 2017).
- **High Cost of Development:** The cost of gamified learning changes depending on your chosen system. Certain equipment, software, and instructor training will have a specific expense. These costs are sometimes passed on to students in the form of registration fees, raising the entry blockade to the classroom. Support and maintenance expenditures are also associated with technologies offered online or hosted at the campus.
- **Diminished Value over Time:** The development and maintenance of games can be costly. Even if the material is not outdated, games that seemed complex when they were first launched may look old a few years later. In the workplace, this might give the employees the impression that the content is outdated, even if it is not. A second disadvantage, which is also connected to the game's long-term worth, is that learners who want to revise a small portion of the content may not want to play the full game after already investing time and effort in finishing it once. They may want to instantly have the content available outside the game for easier access. We can figure this out using metrics such as the number of access (logins), the number of activities performed (Tenório et al., 2017).
- **Student Assessment:** It is not always visible how the results of a gamified learning activity will relate to your course assessment when choosing a game. While most games have a built-in progress tracker, which translates the student's gaming progress into meeting objectives. It is difficult to find a relation between the games on the market and the course contents so this can be a time-consuming procedure.

Privacy issues also need to be considered. Gamification offers surveillance and publication of the collected data could have some negative consequences. For instance, data concerning challenges – slow progress or failures, can lead to a decrease in motivation (Thiebes et al., 2014).

- Game Logistics: Setting up a game for your course often necessitates much planning and logistics. We need to address various factors like, if the students would play the game at classroom or at home, if there are enough electronic equipment such as computers, smart phones for the students to use. If the students are allowed to play it during class hours or as an interactive session, how much time each student must spend on the games. Repeatedly recalling information across multiple classes and past learning sessions is one of the effective strategies for improving knowledge retention but it is not a preferred learning method for most of the students. (Petrovic-Dziedz, M. 2019).
- Sudden Change from Traditional Methods: The survey conducted by Berkling and Thomas shows that many students were not interested in gamified platforms (Berkling and Thomas, 2013). Especially those who were put under traditional learning methods for a long period of time, felt it difficult to adapt to the gamified environment.

Challenges Faced by Stakeholders

In traditional learning methods, a teacher cannot provide individual attention to every student. Every student is made to take up the same challenges without identifying their unique talents. The biggest challenge E-learning platforms face is identifying each individual's interest based on their capability and learning style and providing quality education. Research also showed that study satisfaction combined with self-perception is an essential mechanism for improving students' academic performance and overall education (Kostagiolas et al., 2019). This way, the Gamification of e-learning platforms can ease the work of teachers by providing a personalized experiences for the students. Providing personalized content helps students identify their strengths and weaknesses and work their way toward success. It is also the core responsibility or the task of the provider to engage the user and provide them with quality learning. The user, on the other hand, also faces certain difficulties. At present, we have a lot of gamified platforms, and the user has to choose the right E-learning platform which interests him/her. In contrast, the gamified platforms also face the same problem of making their platform better than the other platforms grab more users. Content language learning, engagement, motivation, and satisfaction need to be the targeted outcomes of the gamified platforms (Dehghanzadeh et al., 2021). Gender imbalance in computer science has also grabbed researchers' attention, under the representation of women in science, technology and engineering increasingly demands the need to find and improve the current learning approaches (Zahedi et al., 2021).

CONCLUSION

We reviewed the various gamification designs and elements used to motivate and encourage students throughout the learning process. The research conducted on 379 students of an undergraduate course in Spain proves that a social and gamified way of learning will make the learner determined compared to traditional learning methods. Almost every learning platform is gamified with various game elements that keep the learners engaged and motivated.

To improve gamified learning platforms, the attention span of learners can be monitored and minimized from the factors that distract them. The cost of developing a

gamified environment should be reduced to increase the availability of the platforms to everyone. The platforms can be developed so that everyone can share their learning content and have a mutual learning experience. In this way, the cost of the course can be reduced further, or it might be of no cost.

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