

The Effect of Gamification on Student's Learning Motivation: A Mini Review

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Abstract

Background: Motivation is a psychological process that describes the activation of an individual to perform a behaviour by unobservable internal or external stimuli. Voluntary effort, which is closely related to motivation, is required for success in all types of work, not just education. A student's motivation is high if he or she is enthusiastic about learning the material presented in a lesson and acts accordingly. Despite the fact that teachers are constantly looking for new teaching methods and approaches, it is widely acknowledged that motivation and participation are major issues in today's schools.

Objectives: In this article, a literature review focuses on the to identify a novel technique for increasing student learning motivation.

Methods: A literature review was conducted in order to identify a novel technique for increasing student learning motivation.

Results: According to the findings, gamification is one of the most promising methods for engaging students in learning. The use of educational games as a learning tool reinforces not only knowledge but also important skills like problem-solving, collaboration, and communication. Gamification also makes learning more active and enjoyable for both teachers and students. Educational games have recently become more affordable and diverse.

Conclusions: Gamification applications are gaining popularity among students from kindergarten to college. They become more engaged in complex challenges and challenging tasks by using gamification software and simple strategies.

Keywords: Students, Motivation, Educational games, Gamification, Joyful learning, Teacher

1. Introduction

Education and technology are inextricably linked in the twenty-first century [1]. Schools, teachers, and students must be able to use and understand the technology that has evolved at this time. According to the Partnership for 21st Century Learning, students must have skills, knowledge, and

abilities in information technology and media [2], [3]. As a result of these demands, teachers must be able to assist students in developing the ability and skills in the field of technology by creating learning media for students. As a result, teachers created various types of learning media in order to create a good and interactive learning environment [4]. Good learning media are created in accordance with learning objectives and are practical in their application so that they do not impede students' learning [5].

Furthermore, teachers must create a variety of interactive and enjoyable learning models in order to increase students' interest in learning. According to several studies, fun learning, such as games for learning, can increase motivation and interest in the education field [6], [7]. Game-based learning (GBL) is one of the exciting new learning methods and models being developed [8]. As time passed, various other alternatives emerged as a form of game-based learning (GBL) development, such as the emergence of educational games as learning media and gamification in education. Gamification is being developed not only in the field of education, but also in the fields of politics, economics, and others. Because of the positive outcomes and growing student interest in games, particularly in education, gamification styles have received a lot of attention in recent years [9].

Many people are perplexed by the terms "game-based learning," "gamification," and "educational games" [10]. Despite the fact that they are all game-based, the terms "game-based learning," "gamification," and "educational games" have different meanings. There are various concepts associated with "game-based learning," "gamification," and "educational games" [11]. Game-based learning is the use of games to improve students' learning experiences, whereas gamification is the addition of game elements to non-game situations [12]. Making games to help people learn about a subject and develop a concept of the subject is the concept of educational games.

In terms of economics, gamification can be used to replace traditional marketing methods and increase user engagement in the twenty-first century. Feedback, leaderboards, points, and levels are common gamification elements used in general [13]. The benefit of using gamification is that the development costs are low, and it allows you to create more and more interesting learning content by incorporating game elements [14].

Gamification in education assists teachers and students in determining how to incorporate game fundamentals in a specific non-game setting [15]. Gamification was created to combine game elements in order to improve human motivation and achieve individual goals [16]. Gamification can make learning more active, which can lead to higher levels of motivation [17], increased user interaction, and increased loyalty [11].

In this paper, we discuss the use of gamification in education, understanding the various types of gamification in previous research, and the future use of gamification. The literature review method was used in this study to dissect the definition of the gamification concept, the difference between "gamification," "game-based learning," and "educational games" [18], the use of gamification in education, and the discovery of successful gamification applications. This literature review method was carried out by collecting studies on gamification and then conducting an analysis on the results of studies that were found to answer the goals of this paper.

2. Objectives

This paper discusses the use of gamification in education, the types of gamification identified in prior research, and the future applications of gamification.

3. Methods

This study used the literature review method to dissect the definition of the gamification concept, the distinction between "gamification," "game-based learning," and "educational games", the use of gamification in education, and the identification of effective gamification applications. This literature review was conducted by collecting studies on gamification and then analysing the results of studies that were found to be relevant to this paper's objectives.

4. Results

GAMIFICATION: "What is Gamification?"

Gamification is a popular and in-demand method for developing learning [19]. Gamification is well-known as a technique for incorporating game elements into an unpleasant environment in order to make it more alive [20]. Gamification is commonly defined as the incorporation of game elements into non-game situations [12], [16], [21]. Another definition from the perspective of process is that gamification transforms process into a more game-like activity [20].

Gamification is the incorporation of game elements into non-gaming software applications in order to improve user experience and engagement [22], [23]. Gamification is a product design exercise that incorporates gaming elements to increase creative value and generate beneficial behaviour, either individually or collectively [24]. Gamification also refers to the use of game design elements (such as points, levels, badges, and so on) and game characteristics (such as assessment, and challenge) [25]. Gamification incorporates game elements into a context rather than as a form of entertainment. Gamification's goal does not have to be to improve the playing experience, but it can

be interpreted as an increase in the motivational component [21]. According to [26], gamification was most commonly used in the domain of education or learning, followed by health and exercise. Positive reinforcement, step-by-step tasks, direct feedback, and progressive challenge are some of the elements of gamification that relate to learning behavior [14], [22], [25]. The user's role as a social entrepreneur who is developing his social business is incorporated into the gamification-based learning experience [9], [20]. According to research conducted by [27], the majority of gamification has a positive impact on user cognition and behaviour. Gamification is becoming increasingly popular among students in an effort to increase motivation and learning activities [23], [28].

The two types [19] of gamification are structural gamification and content gamification. Structural gamification does not develop learning materials such as a game's structure, but rather adds game elements to the structure of the learning. In the meantime, content gamification develops educational materials by incorporating games. Badges, rewards, levels, points, and leaderboards are frequently used game elements in the gamification approach to education [19], [25], [27], [29]. Gamification in the context of education is not a game product, but rather the application of game elements [30] in learning to increase student motivation [31], [32].

The majority of individuals frequently misunderstand game-based learning, gamification, and educational games. Conceptually, economically, monetarily, and in terms of content, all three have distinct characteristics [11], [33]. The differences between game-based learning (GBL), gamification, and educational games are presented in Table 1. The use of gamification in education can be beneficial for teachers and students because the cost of game-based learning (GBL) and educational games is lower [34]. In addition, gamification can be implemented in learning media such as learning management systems (LMS) and other systems to increase student interest in learning [35], [36].

TABLE 1. Difference between game-based learning (GBL), gamification, and educational game

Comparison	Game-based Learning	Gamification	Educational game
Concept	Use game for increase learning experience	Gamification is an idea to adding game elements into non-game situation	Designed for help user learning about some subject and develop concept
Level	Difficult	Easy	Difficult and easy
Reward	Intrinsic reward	Collecting points and levels up	Score points

Cost	Expensive	Cheap	Expensive
Content	Metamorphosed to fit the scene in the game	Can be applied in LMS or other system	Structured, game played without story context.

Benefits of gamification in education [32], [33], [37] as in the following:

- It provides opportunities for overcoming cognitive process problems;
- It develops students' communication skills;
- It teaches students how to control the action of their skills during team activities;
- It helps students find solutions to problems;
- It makes students more active in the learning process;
- It prevents students from becoming bored with the learning process; and
- It can increase students' socialisation and interaction with one another.

According to previous research, gamification is the use of game elements in non-game contexts [32]. Gamification has the potential to increase an individual's intrinsic motivation and have a positive effect on its users' attitudes and behaviours [38], [39]. Motivation is one of the essential components of a successful learning process, and education is considered effective if students find it enjoyable. According to research, the presence and integration of diverse forms of motivation, such as intrinsic motivation, are required to maintain and enhance academic performance [40].

Motivation is divided into two categories in the academic world: extrinsic motivation and intrinsic motivation. Extrinsic motivation applies behavioural conditioning by increasing or decreasing the frequency of behaviour in response to external stimuli [36]. Extrinsic motivation [41], [42] motivates people to complete tasks by emphasising outcomes over processes. In contrast, intrinsic motivation develops an individual's internal drive to engage in activities based on his or her own motives, values, and interests.


APPLICATION: Gamification in Education


There are numerous learning media that use gamification today [43]. These media were created to aid educators in the implementation of instructional materials. Table 2 lists several gamification-based educational support applications [29], [33], [44].



TABLE 2. Gamification Application as Learning Media in Education


Ref.	Application	Characteristic	Superiority	Weakness
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[33]	ClassDojo	ClassDojo is software that helps improve student behavior quickly and easily. This software also motivates student to cultivate a positive attitude	<ul style="list-style-type: none"> • Provide positive and negative attitude assessments for student • Share student data can be arranged by the teacher. • Parents can monitor through the website because teachers can share data through the website • Teacher can design question or exercises using save timer • Easy to use and access • It doesn't cost much. 	<ul style="list-style-type: none"> • Teacher must write down the students name one by one • Teachers cannot send file • Teachers cannot check the result of students assignments, can only give grades • There is no time limit/deadline in submitting assignments
[33], [45]	Quizizz	Quizizz is a fun, multiplayer, free formative	<ul style="list-style-type: none"> • Teachers can give assignments in a fun way 	<ul style="list-style-type: none"> • Students can open a new tab, so students can go log in

assessment application that works on all Ios, Android, Windows devices.		<ul style="list-style-type: none"> • Accessible via all browser • Displays performance analysis data of each student and can be downloaded as an Excel Spreadsheet • Teachers can set the test according to his/her goals • Students need a code, so that just anyone can't access • Can display students ratings after finishing answer the questions 	<ul style="list-style-type: none"> • with another account • Difficult to control students opening new tabs • Students may drop in rank even though they have finished answering all the questions. • It will be a problem if students are late to join
[46]– [49]	Kahoot! 	<p>Kahoot! It is a learning game platform that can be used to create interactive quizzes, discussions,</p>	<ul style="list-style-type: none"> • Can be accessed via smartphone, laptop, or computer • Teachers can give homework • Requires a stable internet connection • Students can open new tabs, so they can trick students from accessing

	surveys, and free of charge	<ul style="list-style-type: none"> • assignments • User friendly • No application installation required • There is a time allocation feature to answer questions • There is an analysis feature of the assessment result • Varied game content 	<ul style="list-style-type: none"> • other things on the internet • Tracking student progress is complex 	
[33]	<p>Knowre</p>  knowre	<p>Knowre is an online platform for learning mathematics. Knowre helps teachers structure lessons with students personally</p>	<ul style="list-style-type: none"> • Provides step-by-step problem solving instructions via video • Provide online mathematics curriculum for each students • Fun math learning experience • Provide a chatbox so that there is 	<ul style="list-style-type: none"> • Requires an internet network device, laptop, computer, or smartphone.

			interaction between teachers and students	
[50], [51]	Socrative 	<p>Socrative is an application that facilitates teachers to create quizzes and run them online. In addition, Socrative helps teachers assess student's abilities in real-time</p>	<ul style="list-style-type: none"> • User-friendly • Easily accessible by teachers and students • Teachers can make various forms of quiz • Teachers can access the question bank • Provide analysis of assessment result • Provide interactive features between teachers and students 	<ul style="list-style-type: none"> • Requires an internet network device, laptop, computer, or smartphone.
[52]	Duolingo 	<p>Duolingo is a language learning application. Duolingo contains questions about language on</p>	<ul style="list-style-type: none"> • Free and easily accessible • Fun learning like playing games • The materials provided is complete from 	<ul style="list-style-type: none"> • Using sentences that are rarely used for communication • Does not provide communication features between users

		certain themes that must be solved	the basic level to the highest level	<ul style="list-style-type: none"> • There are advertisements so if you want to get rid of them, you have to pay • Requires an internet network device, laptop, computer, or smartphone.
[33]	Ribbon Hero	 <p>Ribbon Hero is a video game developed by Microsoft Office Labs. The game is available as free download and serves to educate Microsoft Office 2007 and 2010 users.</p>	<ul style="list-style-type: none"> • Use of the application according to capabilities • User can define weekly target • The material is packaged in the form of text, visual, and audio 	<ul style="list-style-type: none"> • Requires an internet network device, laptop, computer, or smartphone.
[29], [44]	HEgameApp	HEgameApp is a gamification-	<ul style="list-style-type: none"> • Integrated with Facebook so users can post achievements to their Facebook wall • Each challenge on Ribbon Hero is designed to teach users Microsoft features • Challenges can be done in any order and will earn points 	<ul style="list-style-type: none"> • Requires an internet network device, laptop, computer, or smartphone.
			<ul style="list-style-type: none"> • Can be used on iOS and 	<ul style="list-style-type: none"> • Requires an internet network

	<p>based test application. This application provides an additional learning resource, where they can publish the content of their subject, then it will be assessed by their peers</p>	<p>Android devices.</p> <ul style="list-style-type: none"> • Has different presentation features such as Theoretical Question, Useful Resources, Presentation, News, and Other Aspect • Users can present content according to the selected features in structured way • Provide rewards for students who complete task 	<p>device, laptop, computer, or smartphone.</p>
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These applications have been widely utilised by teachers and students as learning tools. The developed application has both benefits and drawbacks. With the availability of applications such as Quizizz, Kahoot!, Socrative, and others, teachers are able to determine which learning media are appropriate. In addition to the applications listed in Table 2, there are numerous additional gamification-based applications.

5. CONCLUSION

Education is the most common application of gamification. However, gamification is also utilised in other fields, including business, commerce, health, and exercise. The primary characteristic of gamification applications is to increase motivation for goal achievement. Through gamification, we can develop the mindset that failure is not something to be feared when attempting

something new. Gamification enhances the fun and enjoyment of learning. Gamification encourages and enhances students' engagement in learning activities.

The majority of gamification-based learning has a positive impact on learning outcomes. Several studies have demonstrated that gamification improves educational outcomes compared to traditional methods. Through the use of gamification software and simple strategies, students can become more engaged in complex challenges and challenging tasks.

As described previously, numerous types of software have been developed, including ClassDojo, Quizizz, Kahoot!, Knowre, Socrative, Duolingo, Ribbon Hero, and HEgameApps. The result of gamification software development must be tested and analysed further. The application of game elements and game mechanics is contingent on the primary learning objective. Gamification applications are becoming increasingly popular and widely used among students from kindergarten to college.

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