

Using Gamification To Increase E-Learning Engagement

Sri Watini¹, Widhy Setyowati²

¹Early Childhood Education Teacher Education, Universitas Panca Sakti Bekasi, Indonesia

²STIE Bank BPD Jateng, Semarang City, Indonesia

e-mail: srei.watini@gmail.com, widhisetyowati61@gmail.com

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Abstract

E-learning is limited from a pedagogical standpoint because it can't emote or captivate students the same way a teacher can. To compensate for the lack of sensation or emotional engagement, an e-learning system must aim to encourage students in other ways. JB Fogg conducted study on the subject of persuasive technology and how to develop tools that affect a user's emotions. He introduces the Fogg's Behavior model, which looks into the circumstances that can lead to a particular behavior. There are numerous uses for this idea in human-computer interaction. Games are a regular aspect of life that delight players while also modeling behavior. We can improve user engagement with an e-learning application and its particular activities by incorporating game mechanics and dynamics into tasks and e-learning processes. Gamification is a term that has many applications in business practices and suggests tried-and-true methods that are comparable to those used in games. Gamification is the process of integrating elements of gaming into non-gaming applications, particularly user-friendly internet and mobile platforms. Furthermore, it seeks to persuade users to engage in the appropriate behaviors in respect to the applications. This description is connected to the terms serious games, serious gaming, playful engagement, and game-based technology. In this section, we'll examine each one in more detail, as well as examine how well they apply to e-learning and the learning process as a whole.

Keywords: *Gamification, E-Learning, Engagement, Games, Technology*

1. Introduction

The concept of utilizing games to teach is not novel [1]. This is common practice, particularly when there is direct connection between instructor and pupils [2]. It might be difficult to translate this into a digital format for instruction and learning [3]. When faced with this dilemma, we advise gamifying the e-learning process [4]. The implementation of game mechanics in non-game applications is known as gamification [5]. Gamification can theoretically be used for any application, task, process, or situation [6]. The primary goal of gamification is to increase user engagement by employing game-like approaches such as scoreboards and individualized instant feedback, which let people feel more ownership and purpose when doing activities [7].

Gamification is utilized in a variety of settings, primarily in business and marketing [8]. However, we also want to show how useful and significant it is in the educational setting [9]. In order to increase motivation, we want to incorporate game components into job activities, but in order to do so, we must pay close attention to how workouts and tasks are incorporated into the game design [10]. Developing learning games necessitates the use of pricey resources [11]. Gamification can be used to make content more appealing and engage consumers in a simpler but still effective way [12].

We hope to encourage a more effective and enjoyable learning behavior by implementing gamification in online learning [13]. JB Fogg claims that when playing video games, people interact with computers much like they would with other people [14]. Students must be motivated and also be able to overcome hurdles if they are to alter or trigger a particular behavior [15]. Gamification also entails participation in a social game as well as communication with other players [16]. According to Fogg, when people experience social presence, they instinctively act socially and experience emotions like empathy or rage or behave socially by taking turns or other socially acceptable behaviors [17].

2. Research Method

2.1. Educational Gamification

The usefulness of gamification in education has, however, received little examination [18]. The writers begin by defining gamification, what it is, and how it might be employed while also outlining potential drawbacks in the event of abuse [19]. They describe it as the application of game dynamics, frameworks, and mechanics to encourage desired actions [20]. Returning to Fogg's original thesis, we may use gamification to reward certain behaviors and discourage others, demonstrating its usefulness in learning in general and e-learning in particular [21]. A gamification design that does not support the goal of encouraging students to participate and support teachers, for instance, could educate pupils that they should only learn when given an extrinsic motivation, which could be dangerous [22].

The authors observe a significant rise in the gamification of education [23]. All training programs motivate users to reach their targeted goals by incorporating game aspects like time, precision, and point systems [24].

2.2 Gamification

Gamification is the introduction of game play aspects in non-game applications, specifically consumer-oriented online and mobile sites, to encourage people to utilize them. Additionally, it aims to motivate users to exhibit the necessary behaviors in relation to the applications. The Simple games can be added to mundane jobs to make them more motivating. Mundane

activities, especially when done for an extended period of time, are not interesting. Gamification is the process of turning necessary tasks into games, and it has applications in a variety of fields, including education.

Although gamification is a relatively new idea in both research and the industry, it has enormous potential. It has been included in the 2011 Gartner Hype Cycle. According to Gartner Group, gamification will be an important business trend that every CIO, IT planner, and enterprise architect should be aware of.

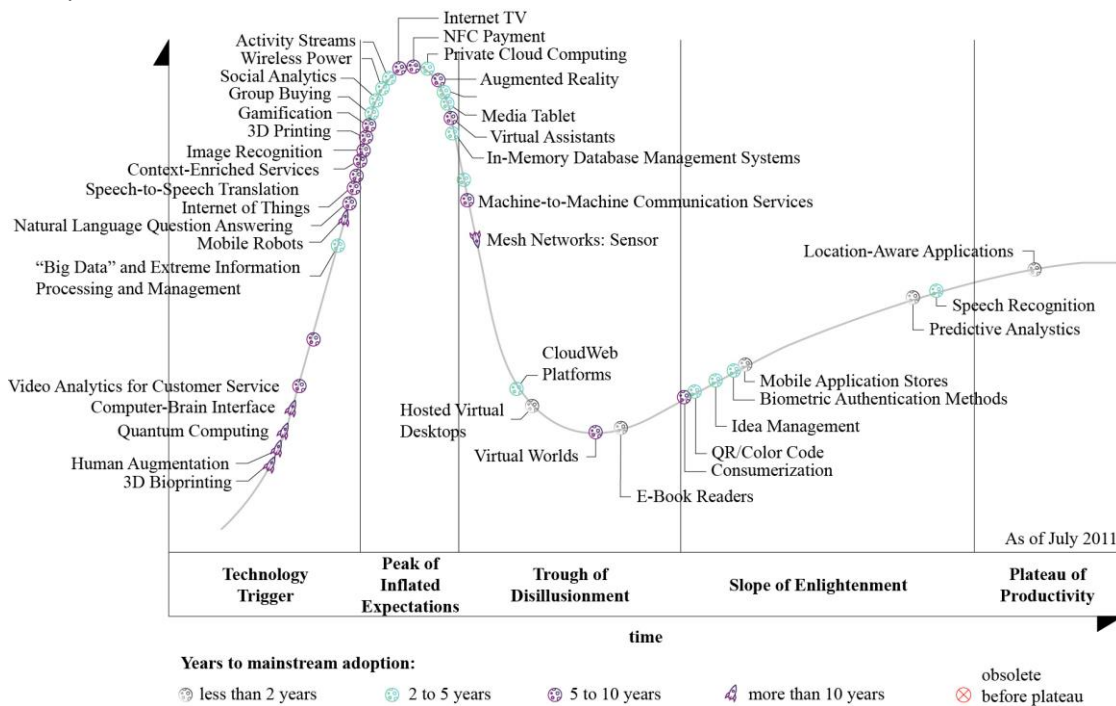


Figure 1. Gartner 2011 Hype Cycle

According to our views, gamification can be utilized successfully in the educational setting as well. Gamification has lately been used successfully on websites to foster loyalty, brand awareness, and effective marketing engagement (Foursquare, Stack Overflow).

There are several effective gamification examples, including Nissan's ZeroEmission application for the Nissan Leaf hybrid vehicle. Applications like Kobo Reading Life and Nike ID, which let users create their own shoes and award points for the most popular creations, both attempt to make reading more fun. Keas, FitBit, and Lose It are a few examples of gamification applications in the health and wellness sector. Stick.com, MindSnacks, and EnglishAttack are some further examples of motivation and learning tools.

In order to increase motivation and engagement, gamification aims to mix internal and extrinsic incentive. Altruism, rivalry, cooperation, sense of belonging, love, and hostility are some examples of intrinsic motivations that emerge from within the user or actor. Contrarily, extrinsic motives happen when something or someone forces the user to take a certain action, like missions, classifications, levels, points, badges, and awards.

Figure 2 illustrates how certain game features can be used to create intrinsic drive.

AESTHETICS

		Reward	Status	Achievement	Self Expression	Competition	Altruism
GAME MECHANICS	Points						
	Levels						
	Challenges						
	Virtual Goods						
	Leaderboards						
	Gifts & Charity						

Figure 2 shows how aesthetics and game mechanics interact. [Bunchball.com]

There are a few crucial elements that must be taken into account when attempting to gamify an application and which combine to form a cogent overview of the complete functioning (utility) of an application or website. The design of the game incorporates gaming mechanics and elements to produce gameplay. A collection of guidelines and feedback loops known as game mechanics produce the gameplay. They stand for the cornerstones of any gamified environment. Three characteristics define each game mechanic:

Game Mechanics	Progress, Criticism, and Behavioral
Benefits	Engagement, fidelity, time spent, sway, amusement, SEO, user-generated content, and virality
Sort of Personalities	Explorers, achievers, and socializers, are all examples of people who fit this description

2.3. Literature Review

A. Behavioral Model of Fogg and Persuasive Technology

From a pedagogical perspective, e-learning is constrained by its inability to convey emotion or engage pupils in the same way that an instructor can [25]. An e-learning system must make up for this absence of sensation or emotional interaction by attempting to motivate students in other ways [26].

JB Fogg researched the idea of persuasion technology and how to create systems that have an emotional impact on the user [27]. He proposes the Fogg's Behavior model, which investigates the circumstances that can lead to a specific behavior [28]. This concept has a wide range of applications in human-computer interaction [29].

The model is made up of three primary components: motivation, ability, and triggers, which when combined can decide a goal behavior [30].

We also attempt to determine how this model might be used to benefit users of an e-learning system. As previously stated, in order to properly go over course and learn, the student

must be motivated, capable, and activated at the same time. He can't read, learn, or solve problems until he reaches the behavior activation threshold. Flow is the desirable condition for the learner, an optimal state that translates into focus, when we feel the students engage most effectively and genuine learning occurs.

When it comes down to it, motivation can be sparked by pairs of opposites like pleasure or pain, hope or fear, and acceptance or rejection in social situations. For instance, if a student has the ability to solve an issue but lacks the will to do so, he won't. When his social status is at stake or he is aware that he may receive a low mark, he will be motivated to address the problem, whether positive or negative.

On the other hand, aptitude is another element that affects whether a behavior occurs. Even if a person is strongly driven, he cannot engage in an activity if he lacks the necessary skills. However, strong motivation can lead a person to seek out the resources necessary to complete a goal, enabling them to develop the necessary skills.

Additionally, Fogg claims that a behavior cannot be determined solely by talent or motive. A trigger is something that tells the user to execute an action at a specific time; this is also known as a call to action. They can be a spark, which motivates a user, a facilitator, which offers ability to highly motivated users, and finally a signal, which works as a reminder when users have both ability and motivation.

Target behaviors include things like giving money, purchasing something, and sharing with others.. We can respond quickly to stimuli thanks to technology and computers. As technology advances, e-learning may evolve into m-learning, with courses becoming context aware and supporting many forms. Due to the size constraints of mobile phones, we must alter the structure of courses and evaluation to match these smaller surroundings while still achieving the desired purpose.

B. Real-world and Online Learning Games

Daily living includes games. The 2010 video game market in the United States was worth over \$25 billion. Games' primary objective is entertainment, but due to their broad appeal, they also serve additional purposes in many facets of daily life. Along with being used for entertainment, games are also used in the fields of politics, religion, education, science, health care, emergency management, and the military. They are also known as serious games, and their major objectives are to educate, research, or market.

Serious games are entire games with serious goals and are built properly, whereas gamified applications just employ some components from games.

It's not a new idea to teach through games. According to Jonathan Franklin, there are at least three different forms of educational games: traditional edu-tech games, student-created games like Scratch, and gamified courses, which involve incorporating game elements into various applications, assignments, and other activities, games have aided students in more engagingly achieving their academic goals, whether offline or online. However, it's important to understand the distinction between gamification of e-learning and so-called "educational games" (serious games, simulators). The first uses more resources, game design expertise, and graphics, whereas the second uses fewer resources and a less unique concept.

3. Findings

We will attempt to use an e-learning course as an example of how gamification might be used in the next part. The majority of e-learning programs are linear in nature. We can simply gamify the content with this style of content organization. The fundamental concept is to gradually reveal content, provide greater attention to exercises while providing theoretical ways for them to be done, and award points for correctly answering them.

3.1. Problem

Why do we gamify a service, what are the goals, and what are the benefits anticipated? are some issues we try to address when creating the gamification of the course. It is crucial to keep in mind the topic we are discussing. Several different personality types can be recognized in game psychology. Achievers, explorers, socializers, and killers are among these personality types.

3.2. Research Implementation

We'll start by talking about an information retrieval course that Bamber studied as an example of an online course. Although we are unable to access the course's materials, we do attempt to improve the system by analyzing the example.

Any e-learning platform's goal is to provide users with knowledge, and most often they do this by providing ways for them to give feedback. The major objective is to inspire students to absorb the material as thoroughly as they can in order to succeed in the course and perform well on assessments.

The goal of this application is to increase student engagement with the systems and encourage users to study. We anticipate that users will do better on final exams, achieve better results, and move through the course more quickly as they spend more time using the system.

In, the authors offer an information retrieval e-learning course that is split into two distinct modules, IR1 and IR2, and that has been utilized for five years by distance learning students. The two modules have distinctive characteristics. Two separate sorts of users—two in total—are presented with the course material in the didactic concept:

- E-learning resources that support in-person instruction
- Distance education combined with actual attendance on-site for debate
- supervised online instruction
- Unsupervised distance education

The information differs from one category to the next. The information supplied in each form should be complete, but since the first group, for instance, can benefit from ongoing monitoring and assistance, the e-learning system should make up for this for the second group and establish support systems for students who have issues. The first group gains from instruction and activities throughout the course as well as resources offered by the e-learning platform such as scripts, self-assigned examinations, and midterms. The final two use forums, emails, or chat, whereas the first two regularly interact with the teacher.

The following gamification components are suggested in addition to the knowledge that is currently present in the course:

- Every learner needs a profile to change their individual information, or avatar as it is known in game mechanics, and personalize it to their tastes. They choose preferences and classes that they take, pass, and concentrate on the good outcomes. They can

participate in groups, and they can access an activity stream to get notifications, news, and updates.

- There are several major chapters or sections in the course. We break the course into tiny parts of coherent content using the cascading information principle. Although the information should be artificial, connections to more in-depth resources should be provided (links, graphics etc.). Exercises and a final stage of evaluation should follow each item of content. The student receives points for completing the activities at the conclusion of each section. The student moves up a level at the conclusion of each chapter, which is an important accomplishment. His standing is directly impacted by this. Top scores as well as a relative ranking compared to his peers might be shown on a leaderboard.
- Progress bars are crucial for this since they allow students to see how far they have come in the course while also providing feedback on a regular basis.
- To encourage them to visit the application on a regular basis, provide them the option to arrange recurring physical or virtual appointments, curfews, and deadlines.
- To mimic the comfortable setting of a classroom and a classroom community, the system should be made as sociable as possible. This is crucial for those who excel and seek peer recognition as well as to inspire kids through competition or peer pressure.
- Students are given unique rewards for completing challenging exercises or activities.
- Students should receive badges from the system for their good deeds and social participation, such as helping others, leaving comments, and contributing to the application, in addition to their academic accomplishments.
- Offer the option to exchange points or badges for virtual products or even to receive savings on tuition. As a result of these benefits, students will use the program more frequently and be inspired to accumulate more points.
- The student should be notified of the subsequent stage as the course progresses so they are prepared. A powerful motivator, anticipation may keep learners interested and engaged for extended periods of time. It can also keep the learning process moving.

4. Conclusions

Game creation is not required for gamification. Without compromising education's legitimacy, it means making it more entertaining and engaging. Gamification encourages pupils to study, and as a result of the encouraging feedback, they are propelled forward and are piqued to learn more. Gamification can be a strong motivator for people to read or learn more.

According to Encyclopedia, the most crucial metric for gamification success is engagement. Due to advancements in analytics technology, a variety of measures to measure interaction can be incorporated into a website like this. These indicators include: average number of pages viewed by each visitor, time spent on the site, total time spent by each user, frequency of visits, participation, and conversions.

In our upcoming work, we want to apply the suggested gamification aspects to an online course and adhere to the KPIs listed above. Nonetheless, it makes sense that gamification would increase user engagement and motivation with such a system.

The goal of gamifying an online course is to improve performance rather than to completely replace the student's intrinsic motivation, which is stronger and more long-lasting. According to Fogg, gamification provides the right instruments to produce a change in behavior

that is for the better. This method can be used to develop e-learning programs that are more effective and captivating.

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