

# Gamification & Game-Based Learning

2022





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# 01 Introduction

## Background

The dramatic escalation of the global pandemic in 2020, propelled the world into what has now become our new virtual reality. While one can't ignore the loss experienced over the past two years, the adaptability and resilience of global society should be celebrated.

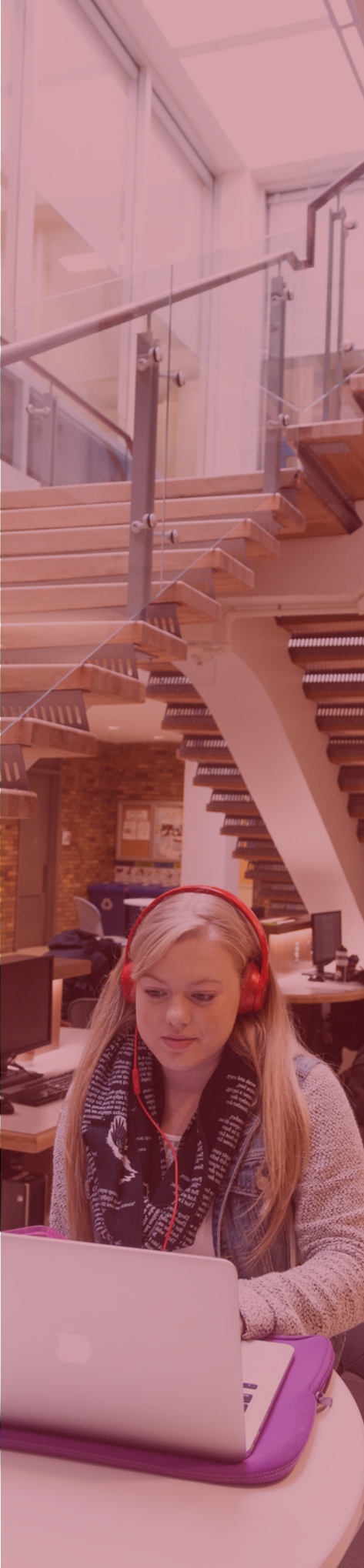
The remote teaching and learning environment was a difficult environment to reconcile with, especially if you didn't consider yourself to be digitally literate. You may have felt isolated from meaningful engagement with your students and colleagues and working from home may have been a daily struggle when it came to motivation.

The use of gamification in education is not a new phenomenon, but popularity has grown exponentially during the pandemic, as educators have been experiencing what Scott Hebert refers to as an engagement crisis.

## This Document

The use of game-like features has become popular among instructors at Higher Education institutions across the globe. They are primarily used as an engagement and motivation tool, which helps enhance the student's chances of achieving the course's learning outcomes. This method is grounded in theories surrounding gamification, which utilizes game elements and game-based learning activities as pedagogical tools.

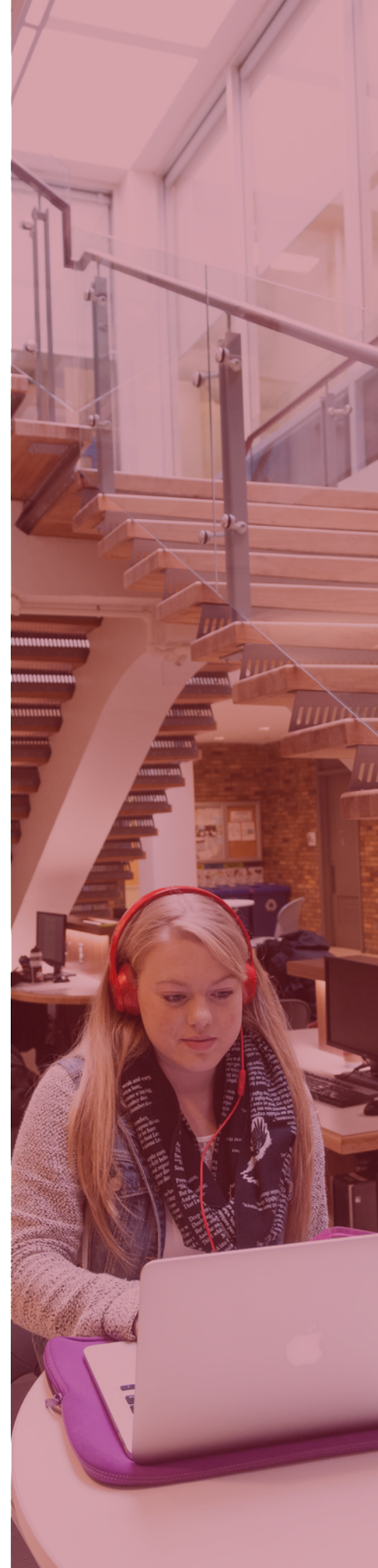
This document will provide you with an outline of what gamification and game-based learning (henceforth referred to as GBL) entails within an educational environment, what elements can be used in gamifying a course, and how to create meaningful and engaging learning experiences within the classroom.



## Learning Outcomes

By the end of this document, readers will:

- Have an understanding of the difference between Gamification and GBL
- Have been introduced to the various game elements that are present within a gamified learning environment.
- Have an overview of how Gamification and GBL support learning.
- Have the necessary knowledge and tools, to begin applying game-like features and GBL activities to both their Brightspace course environment and their face-to-face classroom environment.



A young woman with long dark hair, wearing glasses and a red shirt, is walking from left to right. She has a grey backpack with a white logo on it. In the background is a large, multi-story stone building with many windows and a prominent tower. The sky is a mix of blue and purple, suggesting dusk or dawn.

# 02 Gamification Vs. Game-Based Learning (GBL)

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"It is part of our nature to play, and it is part of our nature to rise to challenges when presented to us if those challenges are interesting."

- Scot Osterweil (2013).

## **Gamification vs. Game-Based Learning (GBL):**

The terms Game-Based Learning and Gamification are often used interchangeably. While the terms may be related, each refers to a specific strategy used when adding game-related aspects to learning materials and experiences.

### **Gamification**

Gamification in education refers to introducing and using game elements (narrative, awards, competition, etc.) in a non-game environment. It applies these game elements to an already existing learning activity to enhance motivation and elicit higher levels of student engagement.

### **Game-Based Learning (GBL):**

Game-Based Learning (GBL) is when a learning activity has been designed in conjunction with a common game framework, to imitate game-like traits in a learning activity. GBL provides an additional method of measuring student performance, by providing evidence of applied comprehension.



## 03 Why Game Elements Support Learning

Gamification is mainly used as a motivation and engagement tool. Motivation forms the foundation of all actions and behaviours performed by an individual in the pursuit of a desired goal. Motivation directly influences goal-orientated behaviours and actions, and in the classroom, behaviours are defined by the learning goals, which henceforth become goal-directed behaviours.

Active student engagement and participation are forms of goal-directed behaviours performed by highly motivated individuals.

**Rewards** can serve as motivators themselves, and can come in both tangible (badges, certificates, etc.) or intangible (praise, fame, etc.) forms. It is important to aim to incorporate intrinsic motivators as the primary motivators in a course, as they move one to act, purely out of enjoyment of a task/challenge, and not by external factors (rewards, pressures, etc.).

This will create a more meaningful learning experience for students, as the students will be motivated by internal factors, as opposed to external ones (extrinsic motivators).

# 10 Benefits of Gamification in Education

**1**

It supports the findings of **the Social Learning Theory (Albert Bandura)** which suggests that people learn best in social contexts through collaboration within a knowledge-sharing culture.

**2**

It **prioritizes the social needs (Abraham Maslow) of your students** to boost motivation. Humans need to feel 'Love and Belonging' by having meaningful social interactions with other knowledgeable individuals (Lev Vygotsky) to thrive.

**3**

It provides an opportunity for personalized engagement by knowing the power of the Pre-Frontal Cortex, which houses brain activity related to affect regulation and memory retrieval/retention. Allow students to make personal connections with course material/contents, as it will **strengthen intrinsic motivation, increase active student engagement,** and **positively affect academic performance.**

**4**

It **increases levels of certain hormones (Oxytocin, Dopamine, and Endorphins)** which improve learning functions in the brain which translates to more successful academic performances and better-happier- learning experiences.

**5**

It **boosts serotonin levels** by introducing rewards systems and gives students an elevated sense of self-confidence. It helps to allow students to view their past achievements and maintain an elevated sense of self-worth (maintain high serotonin levels).

## 10 Benefits of Gamification in Education

6

It helps **reduce cortisol (stress hormone)** levels by using gamification elements, or designing GBL activities because cortisol (stress hormone) sends the brain into survival mode and blocks the brain's cognitive learning processes.

7

It helps **decrease cognitive overload** by using Gamification and GBL to 'chunk' information into sections that progress from simple to more complex. The content is presented in a logically sequenced manner, which allows students to move through the material at their own pace.

8

It **breaks traditional norms of practice** by leaving the comfort zone by applying what is called the '**nudge theory**', which is centred around influencing people's decisions and behaviours through simple alterations of environmental factors. Therefore 'nudging' people in a certain direction, helps them overcome social misconceptions about games in the classroom.

9

It helps to **reinforce good learning habits** by introducing extrinsic motivators as a reward system to reinforce good learning habits in the classroom.

10

It helps to **prepare students for the working world** by using game elements and GBL activities, to teach them a few necessary skills like resource management, project prioritization, time management skills, etc.





## 04 Game Elements

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When gamifying a course it is important to consider which elements will compliment your course framework, and not distract from the learning outcomes defined by the course.

It is very important when gamifying your course, to include an element of playfulness into the learning experience. This can be done by creating room for the development of healthy competition, or by giving out rewards. This section will explore the various game elements which can be used in an educational context.

There are 5 categories of game elements that will be covered in this section:

- The Role of Play
- Competition
- Progression
- Rewards
- Immediate Feedback

### The Role of Play

The famous Swiss psychologist Jean Piaget theorized that play is an integral part of the formation of a child's intelligence. His theory says that while a child may be maturing and aging, playing and engaging with their environment lead to further cognitive development. In the same mind as Piaget, Scot Osterweil (2007) refers to the Four Freedoms of Play which could also be referred to as the **Four Freedoms of Learning**. A successful gamification program uses these four freedoms of play as foundational elements, upon which to build a course. The Freedom to Fail, the Freedom to Experiment, the Freedom to

Assume Different Identities, and the Freedom of Effort, are the four elements which should be present in any gamified learning experience. **Storylines and narratives** are used to engage the players through fantasy and suspense. An example of this is a case study.

## **Competition**

Games involve some sort of competing, which drives participants to play against one another in the pursuit of a mutually desired goal. Competition is one of the key ingredients to making a great game experience (Reeves and Read, 2010). It is used to encourage collaboration amongst groups or friendly rivalries between individuals. Assisting players in maintaining a healthy sense of camaraderie, competitive games can be fun, engaging, and beneficial in the learning process.

## **Progression**

Progression is how a player engages with or moves through a game experience. In an educational setting, this could involve staging course content in a way that increases in complexity as the learner accomplishes a series of challenges. Examples: progress bars, levels/stages, or a tallied points system, where they can visually view their progress in the course. One should also consider how access to further levels/stages will be gained- by completing certain tasks (release conditions).

## **Rewards**

While the primary goal of a game is the successful completion of a task or challenge, the presence of a reward serves as an additional motivator for all players involved. Upon the completion of a task, players receive a reward as recognition of their achievement. Badges, certificates, points, and other prizes are awarded to players who complete a set task or challenge. The size and scale of a reward often depend on the size of the challenge.

## **Immediate Feedback**

Feedback is a commonly present element in the teaching environment, but the use of frequent and targeted feedback may enhance student motivation and engagement, and therefore student performance. This can be done through frequent formative assessment activities.

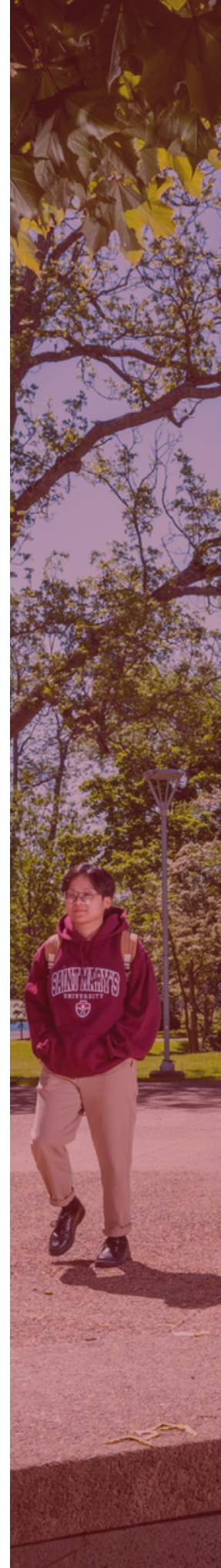
# 05 Game Frameworks

The scale of game elements can vary from large to small and are defined by the amount of time, resources, and planning that goes into creating and implementing them.

Some GBL activities can be designed, developed, and implemented at both large- and small-scale levels.

Game Framework	Large Scale	Small Scale
Alternate Reality/ Pervasive Games	X	
Case Studies/ Clicker Case Studies		X
Scavenger Hunts	X	X
Trivia and Quizzes		X
Easter Eggs		X
Cooperative/ Collaborative Games	X	
Speedruns/ Time Attacks		X
Crossword Puzzles		X
Escape Games/ Breakout Rooms	X	X
Interactive Stories/ Branching Scenarios	X	X

Game Framework	Definition
Alternate Reality/ Pervasive Games	These games are scenario-based activities, where the outcomes of the game are dependent on the decisions and discoveries made by the player(s). These can include clues and puzzles to help the player(s) progress.
Case Studies/ Clicker Case Studies	Experiential learning by studying stories of discovery, analyzing the contents, and making conclusions.
Scavenger Hunts	A list of items that need to be collected by solving puzzles and following clues. Conducted in a virtual/real-world setting.
Trivia and Quizzes	Used as a teaching tool to test and strengthen recall. Quizzes can help identify gaps in comprehension.
Easter Eggs	A hidden message to provide the player(s)/ finder(s) with extra information that is to their benefit-either in the course or current task.
Cooperative/ Collaborative Games	Involves strategic coordination of decisions and actions to maximize the group's chances of successful completion of the task.
Speedruns/ Time Attacks	Player(s) work against the work to complete tasks, which involves prioritization and time management skills.
Crossword Puzzles	A fun way to get player(s) to memorize new vocabulary, by solving clues to fill out the crossword.
Escape Games/ Breakout Rooms	Experiential learning that fosters student engagement by having player(s) use available materials (clues, puzzles, etc.) to achieve a stated objective. This usually takes place in a fictional environment.
Interactive Stories/ Branching Scenarios	The evolution of the game is based on the decisions the player(s) make.





## 06 Conclusion

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By understanding these foundational elements, you will be able to begin a brainstorming process to discover different ways of incorporating these elements into your courses and teaching practice. When implementing these elements it is important to always hold your course learning outcomes at the center of the design process, as these elements are meant to enhance and not distract.

By using these elements you will begin to see visible changes in the way your students engage with course material. You may find that they become more involved in class discussions, ask more questions, and display characteristics of highly motivated individuals, which may lead to the development of self-regulatory habits that will help your students maintain their excitement and efforts within the learning environment.

Gamification is a wonderful way to see the classroom light up, with fully engaged and motivated learners. It is our hope that this document will spark further interest on the topic of games in education, and serve as the kindling in your journey to bring an element of playfulness into the learning environment.

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