

# A REVIEW OF GAMIFICATION TOOLS TO BOOST STUDENTS' MOTIVATION AND ENGAGEMENT

CHE KU NURAINI CHE KU MOHD<sup>1</sup>, SITI NURUL MAHFUZAH MOHAMAD<sup>2</sup>, HAMZAH ASYRANI SULAIMAN<sup>3</sup>, FAAIZAH SHAHBODIN<sup>4</sup>, NUR RAIDAH RAHIM<sup>5</sup>, AIZAD AIZUDIN<sup>6</sup>

<sup>1,2,3,4,5</sup> Department of Media Interactive, Faculty of Information & Communication Technology,  
Universiti Teknikal Malaysia Melaka, 76100 Durian Tunggal Melaka, Malaysia

<sup>6</sup>Awfatech Global Sdn Bhd, No. 5-1, Jalan USJ1/1A, Regalia Business Center, 47600 Subang Jaya,  
Selangor, Malaysia

E-mail: <sup>1</sup>cknuraini@utem.edu.my, <sup>2</sup>mahfuzah@utem.edu.my, <sup>3</sup>asyrani@utem.edu.my,  
<sup>4</sup>faaizah@utem.edu.my, <sup>5</sup>raidah@utem.edu.my, <sup>6</sup>info@awfatech.com

## ABSTRACT

Students today are growing up in an increasingly technology-driven world and are becoming more accustomed to using technology. They were grown using digital tools. Significant issues in adapting the learning process to students with various learning preferences must be addressed by educators. One of the educational strategies and methods that increase students' motivation and engagement is gamification. The purpose of the paper is to present and discuss the nature advantages of gamification and provide some suggestions on how to implement it in teaching and learning. In this paper, authors have listed the gamification tools that can be implemented during teaching and learning. This is important to assist the transformation of teaching and learning in higher education and preparing students for future employment in a dynamic environment highly influenced by technology and digital trends. The primary findings could be utilized as guidelines or a resource for gamification solutions to help educators and students engaged in structured learning.

**Keywords:** *Digital Tools, Online Learning, Gamification, Game Learning, Higher Education*

## 1. INTRODUCTION

The concept of gamification is still quite new. The idea of gamification has been around for more than ten years and is always evolving. Gamification is a technique that involves adding game aspects to marketing or corporate procedures as well as instructional content. Since its beginnings in the software industry in 2010, gamification has developed into a technological trend with numerous successful applications (Serafeim & Christos, 2022). The nature of the new technology integrates formal and informal learning so that students can take an active role in using information and communication technology (Che Ku Nuraini & Faaizah, 2021). Since both students and educators do not need to be online at the same time, asynchronous learning gives them more flexibility with their schedules. Students have access to online discussion boards, virtual libraries, forums, and websites where they can access instructor online notes at any time to examine the course materials (Małgorzata, 2023). Designers and developers develop games and gamified

applications, which users (players) use as a service or product (Vieira et al., 2019). It applies game design techniques and aspects to non-game situations in order to influence people's behavior and increase their motivation for and involvement in particular tasks (Sailer et al., 2017). When implemented correctly, gaming mechanics can transform a part of personal or professional life into a game. Points, badges, and leaderboards are examples of common gamification components that enable an emotional connection to content by encouraging friendly competition that resulting in engaging learning and training experiences. The concept of gamification is inter-disciplinary and has been used by a lot of sectors, including marketing, healthcare, professional development training and politics. The idea of gamification has been increasingly popular in education over the past ten or so years, largely due to the development of digital technology and mobile applications. Therefore, the term "gamification of education" refers to a growing strategy for raising students' motivation and engagement by introducing game design features in classroom settings (Dichev &

Dcheva, 2017). These days, technology controls how people live and to them, it is necessary. The expansion of technology and the accompanying user dependence have taken place over a relatively short period of time. The younger generations that educators are dealing with in the twenty-first century are ICT savvy and exposed to a variety of knowledge sources. The use of ICT in education provides students with more learning possibilities (Che Ku Nuraini et al., 2020). In an online learning setting, students' individual characteristics are noticeable. Online learning options encompass time, length, and subject matter (Che Ku Nuraini & Faaizah, 2021). Gamification is one of the techniques that has caught the attention of educators, who have recently begun investigating its potential to enhance student learning (Dichev and Dicheva, 2017; Majuri et al., 2018; Koivisto and Hamari, 2019). Studies on the effectiveness of gamification are encouraging, with different levels of success (Caponetto et al., 2014; Majuri et al., 2018; Osatuyi et al., 2018; Koivisto and Hamari, 2019).

## 2. PROBLEM STATEMENT

The main problems with modern education are lacking of interest and motivation of students to actively engage in the learning process. Among them are the lack of face-to-face contact with the educator and the feeling of isolation and loneliness brought on by the lack of interpersonal connections (Małgorzata, 2023). Some of these include the absence of face-to-face encounters, which results in feelings of loneliness and isolation (Stewart and Lowenthal, 2022). Numerous studies have clearly shown that in-person participation has the greatest effect on student motivation, which is a requirement for effective learning (Hong et al., 2020; Paul and Jefferson, 2019; Rawat and Singh, 2020). An important determinant of motivation to study is an individual's personality, particularly their emotional factor. It is simple to fall in to outside pressures and distractions when learning online (Ha and Wong, 2010; Ditta, 2020; Salguero et al., 2021). Educators aim to utilize different approaches and strategies in order to engage students and encourage them to take part in classes. The efforts and outcomes accomplished might be acknowledged with rewards as a potential solution, which increases participation and activity. Using gaming elements to aid in learning is the basis for that approach. The use of game concepts and aspects to the educational setting is known as

gamification. Gamification can be used more easily thanks to the advantages provided by e-learning, which is based on contemporary ICT. Data processing for students is automated, and software tools are available to produce thorough reports on their performance (Gabriela et al. 2014).

It makes sense to integrate game aspects into teaching because both games and training have some common facts. In video games, players take activities to overcome barriers in order to win a particular game. There is a learning objective in education that must be accomplished through the execution of particular learning activities or engagement with educational content. Since subsequent actions and moves are depending on the players' performance in games, keeping track of their progress is important. To accomplish the learning objectives in education, it is crucial to track students' achievement. The information and skill levels attained by students affect their learning path (Glover, 2013).

A key component of successfully implementing active learning in the classroom is collaboration. Games have a much stronger competitive component over training exercises. Instead of encouraging student competition, the educational process should place more emphasis on helping students learn how to collaborate, work in a team, and take ownership of the group's performance. Gamification is not directly associated with knowledge and skills. The use of games in the classroom has an impact on students' engagement, behaviour, and motivation, which can develop their knowledge and skills (W. Hsin-Yuan Huang, D. Soman, 2013).

## 3. CONCEPTS BETWEEN GAMIFICATION AND SERIOUS GAMES

Gamification, by definition, is the integration of game features into contexts that non-games setting (Lee & Hammer, 2011). Gamification refers to the application of game concepts, strategies, and features to situations outside of traditional gaming. 'Gameful design' or 'game-like design' are other terms that have been closely related to gamification (McGonigal, 2011). Some terminology and ideas are similar, such as "gamification," "game-inspired design," "serious games," "simulations," and "games." They are not clearly separated by specified lines. The previously stated concepts share a characteristic. They made use of game-specific components with the goal of

improving user engagement and supporting learning.

1. **Game inspired design** is the use of ideas and ways of thinking that are inherent in games. Game inspired design expresses itself more through the use of fun design than through the addition of game features.
2. **Gamification** is the application of game metaphors, concepts, and ideas to a situation that is not a game in order to increase player engagement and motivation and to influence user behaviour (Marczewski, 2013).
3. **Serious games** are games created with a specific goal in mind, such as training, rather than just for entertainment. They seem like games and have all the characteristics of games, but their goal is to accomplish a predetermined goal.
4. **Simulations** are similar to serious games, but they simulate real-world things and their purpose is user training in an environment resembling real life.
5. **Games** include everything mentioned above and they are designed for entertainment.

#### 4. NATURE OF GAMIFICATION

According to Kapp, gamification is the process of "engaging people, motivating action, promoting learning, and solving issues utilizing game-based mechanics, aesthetics, and game thinking." (Kapp, 2012). In recent years, gamification has completely revolutionized the educational landscape. The push toward digitalization and the rapidly advancing technology both significantly contributed to its emergence. Twelve game components that can be used in teaching and learning activities were listed by Mohamad et al. (2017). There are avatars, leaderboards, badges, points, levels, awards, progress, challenges, actions, and rules. A leaderboard that displays the rank, names, and score is the most popular game mechanism used in learning and teaching (Daud et al., 2017). Everything is more dynamic in today's classrooms thanks to tablets, e-books, and digital boards, which makes it harder than ever to hold students' attention. However, gamification in the classroom enables educators to rapidly engage students and stimulate their interest in the subject matter. Video games

should not always be used for gamification in the classroom, even though they occasionally benefit learning. Nevertheless, it is simple to modify your classroom gamification to match your teaching methods. Let's look at some attempted methods for gamifying your classroom and engaging your students.

The use of game mechanics enhances learning and motivation in both formal and informal settings. Multiple definitions overlap, and the following can be summarized: Gamification is the incorporation of game mechanics and game thinking into non-game activities. Games have certain unique characteristics that are important to gamification:

- i. users are all participants – employees or clients (for companies), students (for educational institutions);
- ii. challenges/tasks that users perform and progress towards defined objectives;
- iii. points that are accumulated as a result of executing tasks;
- iv. levels which users pass depending on the points;
- v. badges which serve as rewards for completing actions;
- vi. ranking of users according to their achievements.

#### 5. GAMIFICATION TOOLS

Gamification is a powerful technique that designers can utilize to increase user engagement. In order to encourage users to accomplish goals, it is crucial to integrate game components into systems. For example, users want to win awards and enjoy facing challenges (Serafeim & Christos, 2022). The technology of gamification software now offers many tools to offer a game-based learning experience. The alphabetized list that follows will offer a clear idea of the gamification tools that can benefit educator and the learning environment that can be designed for students. Gamifying classroom and keeping it fresh requires plenty of resources to make it interesting and fun learning environment.

Table 1: List of Gamification Tools

| No. | Tool         | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Arcademics   | Arcademics makes multiplayer educational games free math games, free language arts games, and more for K-8 students. Teachers and parents can view analytics and reports that allow customization of game content. The games play out on the iPad and Android app.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2   | Baamboozle   | Baamboozle is a game-based learning platform that contains over one million learning games ideal for use with students in and out of class. These games are designed by fellow teachers and educators and work for students of all ages and abilities. It also enables teachers to easily create their own games and share them with others. The site is simple and easy to use and no prior technical knowledge is required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3   | BookWidgets  | BookWidgets is a gamification software that serves all educators, including; elementary teachers, middle or high school teachers, university professors, and professional trainers. It offers 40+ digital exercise templates that work on smartphones, tablets, or computers. And BookWidgets is a fast and efficient grading system that provides feedback to students and teachers, allowing them to assess problem areas or where students may need extra attention.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4   | Brainscape   | Brainscape boasts of being the world's most brilliant flashcard app. It uses cognitive science gamification software that optimizes studying by repeating more challenging concepts in perfect intervals to maximize memory retention. There is a flashcard for every possible application. And if you cannot find a flashcard deck in their robust database, you can create your own.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 5   | Blooket      | Blooket is a game-based learning platform that allows teachers to create educational games to share with students. You can host live games that students can play using a generated ID or assign games as homework for students to play at their own pace. As a teacher, you can create your own question sets or use ready-made sets created by members of the Blooket community. Students are not required to register to play the games. However, having a student's account allows students to "track their stats, place in global leaderboard rankings, buy and sell Blookies, and participate in upcoming community-wide events. The way Blooket works is simple. Teachers host live games with unique game mode on their screen and students join the play using generated game IDs. Teachers also have the option to assign learning games as homework so that students can work on them at their own pace. |
| 6   | Breakout EDU | Breakout EDU offers 1,800 kit-based digital games that span every grade level. Games are available for core subjects like Math, Science, History, and general topics such as holidays, team building, and more. Through Breakout EDU's puzzle-based game design, students' critical thinking and creativity are put to the test as teams explore clues to create the perfect lock combinations to solve the puzzles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7   | Cerebriti    | Cerebriti, created in Spain, is a gamification software platform that offers two distinct angles to the learning process. First, students create their educational games, and second, they play other students' or teachers' games to consolidate their learning process. There are games on all subjects for all ages, and they are multi-platform.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 8   | ChemCaper    | ChemCaper is a video game platform developed by school teachers that teaches fundamental chemistry concepts to teenagers aged 10 to 14 years old. Students report that they remembered 90% of concepts learned in 6 months after playing the game for the first time. Based on chemistry concepts and the Periodic Table, students can explore unique environments, craft potions, and battle with collectible creatures.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 9   | Classcraft   | Classcraft promotes social and emotional learning (SEL) through its gamification software. Class Craft is a mobile game app where students create their avatars                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|    |             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |             | complete with special powers to navigate the classroom, its rules, and deadlines collaboratively. Educator can utilize Class Craft to get students fully interacting with the rules of your classroom and beyond. And it is a perfect classroom management tool for high school students.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 10 | ClassDojo   | ClassDojo is an app that is great for connecting teachers with students and parents. The app focuses on younger children of primary school age. Creating a positive culture from working hard, being kind, or just helping others. It is brilliant at fostering or strengthening new behaviors. Educators can also keep parents in the loop by communicating the story of their classrooms by instantly sharing photos, videos, announcements or by privately messaging with any parent. Class Dojo will always be free for educators.                                                                                                                                                                               |
| 11 | CodeCombat  | CodeCombat is a video game platform that teaches students how to code through play. It is unique gamification software, students learn to play and write code from the start of their adventure in the game. It focuses on beginners learning Python, Javascript, and C++ programming languages. Teaching over 20 million students Computer Science, CodeCombat teaches students to be critical, confident, and creative learners regardless of experience.                                                                                                                                                                                                                                                          |
| 12 | Course Hero | Course Hero focuses on filling the gap between college and the workplace, offering simple course creation tools. Gamification features are fundamental, with achievement badges for accomplishments like logging on during the weekend, uploading documents, and completing classes. There is a sitewide leaderboard, but lacking here is community or interaction between students. It is strengths come from its study resources, 24/7 homework support, textbook solutions and explanations and expert tutors.                                                                                                                                                                                                    |
| 13 | Duolingo    | Duolingo is a free online language gamification app offering 94+ language courses. It boasts 500 million+ users worldwide. The app offers teachers and its users a fun, gamified way to teach language involving personalized and self-paced assignments. Meet students where they are by utilizing their personalized learning engine. With customizable assignments and lessons, teachers can cater to their learning objectives with ease.                                                                                                                                                                                                                                                                        |
| 14 | Digipuzzle  | Digipuzzle is a website that offers a wide variety of free online educational games for kids. These games target various skill areas from math and geography to science and human body. The Education section in Digipuzzle features tons of educational games covering topics such as math, typing, geography, alphabets, programming, science, animals, history, music, back to school, and more. Each of these categories embed several game genres related to the main theme. For instance, Math games are arranged into the following sub-categories: Fractions, Counting, Multiplications, Math till 10, Math till 20, etc. Each of these subcategories contain games that offer practice on a specific skill. |
| 15 | Edmodo      | Edmodo is a free app that mirrors the functionality of a social media network for educational purposes. It provides tools that allow teachers and users to send messages, share training materials, and make learning accessible anywhere. Edmodo communicates with parents keeping them up to speed on class updates, allowing them to sync with their children's teachers, and support learning at home. And lastly, parents can see classroom activity and grades to support their children's progress.                                                                                                                                                                                                           |
| 16 | Genially    | Genially is a platform to gamify your presentations by making them interactive and fun. It works to elevate the learning experience by allowing you to import any presentation by offering rich animation and gamifying anything from quizzes to escape rooms filled with interactivity. It offers a myriad of templates to plug and play your existing content into so that you can be up and running fast.                                                                                                                                                                                                                                                                                                         |
| 17 | Gimkit      | Gimkit is a gamification software that offers a live learning game show experience with constant updates, new modes, and power-ups that keep the game fresh and relevant. Students answer questions on their own devices and are presented the same questions in multiple ways to ensure mastery of a topic. Students' reward                                                                                                                                                                                                                                                                                                                                                                                        |



|    |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                              | come with in-game cash by answering questions correctly but at the same time can lose some money by answering incorrectly, motivating them to be thoughtful with their answers. It can be used outside of the classroom as homework which facilitates automatic grades for you.                                                                                                                                                                                                                                        |
| 18 | GooseChase                   | GooseChase is gamification software that allows you to run real-world scavenger hunts. There are multiple ways to use Goose Chase; virtual teams, recreation, onboarding, campus orientation, and K-12 education. In addition, it offers real-time game action that includes a live leaderboard and activity feed, reward points for outstanding submissions, and a reporting dashboard analytics to measure success.                                                                                                  |
| 19 | Kahoot!                      | Kahoot offers a game show environment to get students excited about learning. Particularly useful in the school setting for quizzing vocabulary, multiplication, and simple geography. It provides support to many learning settings such as school, work, and home. It is also utilized by more than 1 million+ players per year in more than 200 countries. It is used in the US by more than 50% of teachers and 97% of fortune 500 companies.                                                                      |
| 20 | Knowre                       | Knowre is an online math program platform that supports the needs of all students with a personalized online math curriculum for each student, instructional support at every step, and an intuitive online math interface. Comics are used for grades six and above to introduce lessons and provide a fun visual learning experience. Knowre Math provides standards-based instruction for Grades 1-12 with over 70,000 rigorous practice and real-world application problems organized into topic-specific lessons. |
| 21 | Minecraft: Education Edition | Minecraft: Education Edition is a gamification tool based on the award-winning video game Minecraft. It offers features designed for teaching, pre-built lessons, and cross-curricular support. Meeting children where they are by incorporating a gaming platform that kids are excited about and have brand loyalty with possesses the keys to unlocking the education process in a new, refreshing, and exciting way.                                                                                               |
| 22 | Monster Kit                  | Monster Kit is a board game aimed at primary school children allowing 1 to 10 players. It allows you to practice creative skills by utilizing drawing, reading, writing, doing calculations, and fostering imagination through the development of funny monsters                                                                                                                                                                                                                                                       |
| 23 | Pear Deck                    | Pear Deck is a way to create interactive presentations in the classroom or remotely. It is seamlessly integrating with Google or Microsoft-based systems, so there is no need to learn a new system. Students can interactively respond to questions in real-time that allows teachers to communicate feedback immediately. These responses can take the form of dragging and dropping pins, drawings, multiple-choice, short text, giving students a website, and providing a numbers-only reaction.                  |
| 24 | PlayBrighter                 | PlayBrighter allows you to set your students on missions to complete specific learning objectives in a gamified manner. From spelling to science, French vocabulary, to the Fibonacci sequence, the games employ over 15,000 possible questions you could ask and gives you the ability to add your questions. Utilizing avatars, students can add personas to their learning experience to accomplish learning objectives making the game more interesting                                                            |
| 25 | Quizizz                      | Quizizz is an online app that allows teachers to quiz and test students in the classroom interactively or at home. It offers gamified quizzes, polls, and lessons that can be led by a presenter or self-paced. Students can join from any device with a web browser and use their iPhone and Android Apps. Teachers know instantly what's working and what's not with real-time reporting and key performance indicators.                                                                                             |
| 26 | Quizlet                      | Quizlet is a multi-national American company offering digital flashcards, matching games, electronic practice assessments, and live quizzes similar to Kahoot. It is available in English, German, Spanish, Chinese, Japanese, Korean,                                                                                                                                                                                                                                                                                 |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | Portuguese, Polish, Russian, French, Indonesian, Dutch, Italian, Turkish, Vietnamese, and more. It is an excellent study aid for anything that requires memorization in a fun.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 27 Quizalize        | Quizalize is a gamified quiz making tool that you can use to drive student's engagement, increase their participation, and enhance their learning. Teachers use Quizalize to create various types of quizzes that students can access using a generated code. As students take their quizzes, teachers gather important insights and analytic data about their performance and track students' progress in real time. These reports are especially useful in formative assessment providing teachers with key data to help them plan effective interventions, provide differentiated learning opportunities for students, and inform their lesson planning and teaching strategies.                                        |
| 28 Riddle           | Riddle is a simple and easy to use quiz maker that allows you to create a wide variety of interactive quizzes, surveys, and polls. You can either use ready-made quiz templates or build your own quiz from scratch. It can contain various multimedia materials including videos, audio clips, images, GIFs, and MP4 video clips. It offers different sharing options including embedding quizzes in your website or blog or sharing them via email. As the audience takes your quizzes. It generates detailed analytic reports allowing you to access data about your quiz views, shares, completion rates, and many more.                                                                                               |
| 29 Socrative        | Socrative is a gaming app that offers everything from quizzes to polls and is 100% free to all students. Offering three customizable game modes called "space race" aimed at accuracy and speed, your typical question and answer mode, and "Exit Ticket" aimed at assessing how well lessons are creating a learning experience. Socrative can be installed on smartphones, tablets, laptops, and computers.                                                                                                                                                                                                                                                                                                              |
| 30 Sporcle          | Sporcle is an online trivia and quiz platform featuring tons of fun and engaging games. Sporcle quizzes are arranged into various categories including: Geography Quizzes, Music Quizzes, Movies Quizzes, Sports Quizzes, History Quizzes, Literature Quizzes, Science Quizzes, Language Quizzes, and many more. It also enables you to create your own quizzes to share with others or to embed on your class blog or website. You can make your quiz private in which case it will not be shown in search or on your profile. You can still share the link of your private quiz with friends, play it, and see results. You also have the option to create playlists on Sporcle and save your quizzes in a single place. |
| 31 Toovari          | Toovari is a multi-player platform created and developed in Spain. It allows you to create a class where you can invite students and test their knowledge via game mechanics. It also includes assessments and communication with parents providing a robust environment that capitalizes on the latest technologies.                                                                                                                                                                                                                                                                                                                                                                                                      |
| 32 Virtonomics      | Virtonomics is a business simulation offering student engagement through a gamified experience in economics, entrepreneurship, competition, marketing, finance, sales, production, strategy, innovation, startup development, R&D, HR, supply chain management, and more. It boasts an online community of 1 million players from all over the world engaging in various business platform simulations. The intended audience for these games is business people, entrepreneurs, university and college students.                                                                                                                                                                                                          |
| 33 World Peace Game | World Peace Game is a hands-on political simulation that allows students to discover connectedness through global, economic, social, and environmental crises. The game teaches students the work of peace. The goal is to pull fictitious countries out of turmoil with minor military intervention, thereby creating prosperity.                                                                                                                                                                                                                                                                                                                                                                                         |

Source: Adopted and adapted from <https://xperienify.com/gamification-tools/>,  
<https://www.bookwidgets.com/blog/2019/09/the-best-gamification-apps-and-techniques-for-in-your-classroom>.  
Retrieved on 30th December 2022.

## 6. WAYS TO INTRODUCE GAMIFICATION

A gamified software product is more likely to motivate users and boost their engagement if it contains particular interactive user-interface game features like challenges, badges and stickers, leaderboards, and narrative (Serafeim & Christos, 2022). Below are the ways to introduce gamification:

### 6.1 Set Up a Points System

Gaining points stimulates individuals and makes them feel rewarded for their efforts, much like in video games. Educator can offer to award students points for participation, meeting deadlines, or whatever else you'd want, depending on your class activities. Your point system should complement the way you teach and assist students in following their development. Even your points system can be used as an addition to your grading. You might decide to drop a student's lowest grade or raise their final grade if they receive a certain number of points, for instance. Although gamifying grading is entirely a matter of preference, it can inspire students. It encourages participation while also making the students feel appreciated for their efforts. It might occasionally be demoralizing to get better marks. Students can feel like they are mastering their studies when they get points, on the other hand. They feel driven, are able to observe their skills advance, and are having more fun in class than ever.

### 6.2 Invent a Storyline with Avatars

A good story always puts students in the right frame of mind to learn. Students will be more interested in your game if you take the effort to develop or create a plot. To create the scene, you can pick from the usual tales of pirates, aliens, or zombies. Whatever theme educator decide on, make sure to stick with it throughout the entire game. Allow your students to participate in the fun after you've created the scene. Allowing students to select their own part in the narrative will encourage creativity and increase their involvement with the game. Even better, let them enough time to create an avatar that embodies them. Both young and older students like spending time creating their characters in the virtual world of the game. There are low-tech alternatives to avatars, yet they work well in video games and other digital applications. From costumes to illustrations, as long as you let

your students get creative, their fascination for the story will grow.

### 6.3 Hand Out Badges

Although badges allow educator to acknowledge achievements, points are a terrific way to identify student's participation in class. For the classroom's morale to remain high, it's essential to use both of these reward schemes. The fact that some students don't receive points doesn't necessarily indicate that they aren't working hard. A milestone for the class is also served by awarding badges to students. For example, students may feel as though they have completed a rite of passage after receiving a badge signifying their mastery of a particular programme. The goal of collecting all of their badges is for students to record their progress during the course. In order to increase the level of excitement, educator might even offer extra points or level gains with various badges. Student accomplishments are also recognised through badges. Making badges for the subjects you want your students to learn is therefore time well spent. Educator could also want to make a few badges that are really rare in order to maintain the element of surprise.

### 6.4 Encourage Teamwork

Gamification in the classroom does not have to cause conflict. In fact, allowing student to play in teams may improve the mood in your classroom. Togetherness is fostered and the concept of teamwork is taught through getting students to play and engage in activities. Educator might wish to let the students share power-ups, incentives, or even points within their teams. Students will want to put in more effort to support their team and uplift their teammates. This is particularly true if they can divide the points. Not to mention that students will be feverishly supporting their teammates during the game, which will make it much more exciting.

## 7. DISCUSSION TOWARDS STUDENTS' MOTIVATION AND ENGAGEMENT

One of the ways that gamification tools can boost student motivation is by providing immediate feedback. When students are able to see their progress in real-time, they can quickly identify areas where they need to improve and feel a sense of accomplishment when they successfully complete a task or level. This can help to build self-efficacy, which is a critical component of motivation. Gamification tools can also be used to



enhance the relevance of the learning experience for students. By incorporating game-like elements that are familiar to students, such as quests, challenges, and rewards, gamification tools can help to make the learning experience more relatable and engaging. This can help to build a sense of intrinsic motivation, which is driven by the student's own interest and enjoyment of the learning experience.

Another way that gamification tools can boost student motivation is by personalizing the learning experience. By allowing students to progress at their own pace and offering a variety of challenges and rewards that cater to their individual interests and learning styles, gamification tools can help to create a sense of ownership and investment in the learning experience. Gamification tools have been a popular topic in education research as a means of increasing student motivation and engagement in learning activities. One of the main advantages of gamification tools is that they utilize game-like elements that are known to be engaging and motivating to students. By incorporating elements such as points, badges, and leaderboards, gamification tools can encourage students to actively participate in learning activities and compete with one another in a way that is both fun and rewarding. Another advantage of gamification tool is that they can help to personalize the learning experience for students. By allowing students to progress at their own pace and receive instant feedback on their progress, gamification tools can help to build self-efficacy and a sense of accomplishment, which can further enhance motivation and engagement. It is important to note that gamification tools should be used in conjunction with sound pedagogical principles to ensure that they are aligned with the learning objectives. This means that gamification tools should not be the sole focus of the learning experience, but rather should be used as a means of supporting and enhancing the content being taught.

## 8. RESEARCH ISSUE

In education, gamification can be used to increase students' motivation and engagement in learning activities. Some potential research issues related to gamification tools to boost students' motivation and engagement is effectiveness. Research could investigate the effectiveness of gamification tools on motivating students to learn. This could involve analyzing the impact of gamification tools on student engagement, satisfaction, and performance. Research could also

examine the impact of gamification tools on student learning outcomes, such as retention of knowledge and the development of problem-solving skills. Research could focus on the design of effective gamification tools for different types of learners, learning contexts, and subjects. This could involve investigating the design elements that are most effective in promoting motivation and engagement, as well as the optimal frequency and intensity of gamification. Effect of gamification on student behavior: Research could explore the effect of gamification on student behavior, such as the impact on attendance, punctuality, and participation in classroom activities. Besides that, long-term impact of gamification tools on student motivation and engagement. This could involve investigating whether the effects of gamification persist over time, and whether there are any negative consequences associated with long-term use of gamification.

Researcher also could investigate the cultural factors that affect the effectiveness of gamification in different educational contexts. This could involve exploring whether gamification is more effective in certain cultural contexts, and whether there are any cultural barriers to the adoption of gamification in education. Overall, research on gamification tools to boost students' motivation and engagement could have important implications for the design of educational programs and the development of effective teaching strategies.

## 9. CONCLUSION

Gamification tools have gained attention in the education sector as a promising approach to enhancing student motivation and engagement. There are also some potential critiques of the use of gamification tools in education that need to be considered. Gamification tools often rely on external rewards, such as points, badges, and leaderboards, to motivate students. While these rewards can be effective in the short term, they may not lead to long-term engagement or intrinsic motivation. In fact, if students become too focused on the rewards, they may lose sight of the learning objectives.

Gamification tools may be more suited to some subjects or activities than others. For instance, it may be easier to gamify activities that involve problem-solving, decision-making, or exploration, whereas it may be more challenging to gamify activities that require rote memorization or

conceptual understanding. Gamification tools often involve the use of leaderboards or rankings, which may foster a sense of competition among students. This could be detrimental to students who are not as competitive or who may feel discouraged by not performing as well as their peers. Gamification tools may also have the unintended consequence of distracting students from the learning objectives. If students become too focused on earning points or badges, they may not pay attention to the content or skills that they are supposed to be learning.

Besides that, researcher need for careful design and implementation. Effective gamification tools require careful design and implementation to ensure that they are aligned with the learning objectives and that they do not have unintended consequences. Poorly designed gamification tools may actually decrease motivation and engagement rather than enhance it.

Gamification may be easily and successfully integrated into e-learning. Game mechanics and tactics can be included into learning activities with the goal of achieving specific learning objectives, motivating students to finish them, and placing them in a friendly competitive atmosphere with other students. Gamification is a powerful strategy for improving students' motivation and engagement while also effecting positive change in their behavior and attitude toward learning. Although gamification has been successfully implemented in many different working environments, it is still unclear how employees actually behave in gamified environments. This popularity of gamification is evident over the past nine years in the development of enterprise information systems and e-commerce systems (Serafeim & Christos, 2022). The outcomes of the shift have a bilateral nature; they can have an impact on students' test scores and comprehension of the material being taught, as well as establish ideal settings for effective learning. Gamification design is a user-centered process. By encouraging users to engage more with the gamified environment of the software application, the basic objective is to raise user engagement. Users are more likely to be motivated and engaged by a gamified software application if it contains unique interactive user-interface game features like challenges, badges and stickers, leaderboards, and narrative. Designers may significantly increase user engagement by implementing gamification. In order to motivate users to accomplish goals, it is important to integrate game components into applications and systems (Serafeim & Christos, 2022).

Are there any additional advantages to gamification besides keeping students interested and involved in class? Today's students are virtually continuously bombarded with information and visuals. Educators must reevaluate their methods to stay current if they want to keep up. Even though gamification's critics claim it takes away the instructional components of education, students are still learning, even if in different ways. Traditional educational methods can occasionally be constrictive, uninspiring, and rather ordinary. Students can be motivated by using modern methods in combination with gamification. Gamification enables students to assume an identity, acquire points, and experience a deeper feeling of accomplishment. It is important to note, though, that total gamification might not be the best course of action. Combining traditional and modern teaching methods in one classroom has been found to be more effective. However, including gamification in your classes will provide some diversity for your students and help you better maintain their interest. Future studies may evaluate and develop a design for various gamification tools that meet the standards outlined for learning objectives (Renée et al., 2021). In conclusion, there are various approaches to gamification in the classroom. Gamification for learning is a process that uses game mechanics to enhance learning. The system has automatic data processing, progress tracking for students, completion tracking, and conditional activities as the platform for gamification.

## ACKNOWLEDGMENTS

The authors express their gratitude for the support and involvement in this study especially to Department of Interactive Media, Faculty of Information & Communication Technology (FTMK), Pervasive Computing and Educational Technology (PET), Centre for Research and Innovation Management (CRIM), Universiti Teknikal Malaysia Melaka and other researchers.

## REFERENCES:

- [1] Che Ku Nuraini Che Ku Mohd & Faaizah Shahbodin. "Issues and Challenges from Teachers' Perceptions in Creating Online Learning in The Midst of Covid-19 Pandemic". *Journal of Theoretical and Applied Information Technology*. Vol 99, No 12, 2021, pp. 3039-3049.

- [2] Che Ku N. Che Ku Mohd, Faaisah Shahbodin, Mohd S. Md Saad, Azmawaty Mohamad Nor, Siti N.M. Mohamad & Zurina Saaya. "Educational technologies in a personalised learning environment (PLE): an overview". *World Transactions on Engineering and Technology Education*, WIETE, Vol 18, No 4. 2020.
- [3] Caponetto, I., Earp, J., and Ott, M. "Gamification and education: A literature review. 8th European Conference on Games Based Learning". *Academic Conferences International Limited*. Available online at: [https://www.itd.cnr.it/download/gamificationE\\_CGBL2014.pdf](https://www.itd.cnr.it/download/gamificationE_CGBL2014.pdf) (accessed January 3, 2023), 2014, pp. 50–57.
- [4] Daud, R., Salam, S., Mohamad, S.N.M., Yusoff, A. M. "Modeling a Mobile Gamification Model to Increase Student Engagement: An Analysis Using Analytic Hierarchy Process". *Advanced Science Letters*. Vol 23, No 9, 2017, pp. 8707–8712.
- [5] Dichev, C. & Dcheva, D. "Gamifying education: what is known, what is believed and what remains uncertain: a critical review". *International Journal of Educational Technology in Higher Education*, Vol 14, No 9. 2017. <https://doi.org/10.1186/s41239-017-0042-5>
- [6] Ditta, A.S., Strickland-Hughes, C.M., Cheung, C.S., Wu R. "Exposure to information increases motivation to learn more". *Learning and Motivation*, 72, 101668, 2020. <https://doi.org/10.1016/j.lmot.2020.101668>
- [7] Gabriela Kiryakova, Nadezhda Angelova and Lina Yordanova. "Gamification in Education". *9th International Balkan Education and Science Conference, Edirne, Turkey*, 2014.
- [8] Lee, J. & Hammer, J. "Gamification in education: What, how, why bother?" *Academic Exchange Quarterly*, 2011.
- [9] Ha S., Wong S. "Motivating students to learn through good and helpful coursework feedback". Education 2010. *Inspiring the Next Generation of Engineers*, 2010, 1-13. <https://www.researchgate.net/publication/46284803>.
- [10] Hong, Y., Li, X., Lin, Y., Xie, J., Yan, X., Lin Z. "A Comparative Study of Online Education and Traditional Offline Education During COVID-19". *Research Square*, 2020, 1-19. <https://doi.org/10.21203/rs.3.rs-61593/v1>.
- [11] Kapp, K. M. "The gamification of learning and instruction: game-based methods and strategies for training and education". *John Wiley & Sons*, 2012.
- [12] Koivisto, J., and Hamari, J. "The rise of motivational information systems: a review of gamification research". *Int. J. Inf. Manage.* doi: 10.1016/j.ijinfomgt.2018.10.013. 45, 2019, pp. 191–210
- [13] Majuri, J., Koivisto, J., and Hamari, J. "Gamification of education and learning: a review of empirical literature". *Proceedings of the 2nd International GamiFIN Conference, GamiFIN 2018, CEUR-WS, Finland*, 2018.
- [14] Małgorzata Charytanowicz. "Online Education vs Traditional Education: Analysis of Student Performance in Computer Science using Shapley Additive Explanations". *Informatics in Education*, 2023, DOI 10.15388/infedu.2023.23
- [15] Marczewski, A. "What's the difference between Gamification and Serious Games?" Retrieved from Gamasutra: [http://www.gamasutra.com/blogs/AndrzejMarczewski/20130311/188218/Whats\\_the\\_difference\\_between\\_Gamification\\_and\\_Serious\\_Games.php](http://www.gamasutra.com/blogs/AndrzejMarczewski/20130311/188218/Whats_the_difference_between_Gamification_and_Serious_Games.php), 2013, 3-11.
- [16] Mohamad, S.N.M., Salam, S. & Bakar, N. "An analysis of gamification elements in online learning to enhance learning engagement" in Zulikha, J. & N. H. Zakaria (Eds.), *Proceedings of the 6th International Conference on Computing & Informatics*. Sintok: School of Computing. 2017, pp. 452-460.
- [17] McGonigal, J. "Reality is Broken: Why Games Make Us Better and How They Can Change the World". *London: Jonathan Cape*. 2011.
- [18] Osatuyi, B., Osatuyi, T., & de la Rosa, R. "Systematic review of gamification research in education: a multi-method approach". *CAIS* 42, 2018, 95–124.
- [19] Paul, J., Jefferson, F. "A Comparative Analysis of Student Performance in an Online vs. Face-to-Face Environmental Science Course From 2009 to 2016". *Frontiers in Computer Science*, Vol 1, No 7, 2019, pp. 1-9. <https://doi.org/10.3389/fcomp.2019.00007>.
- [20] Rawat, R., Singh, P. "A Comparative Study between Traditional and Online Teaching-Learning: Medical Students' Perspective in the Wake of Corona Pandemic". *National Journal of Community Medicine*, Vol 11, No 9, 2020, 341-345. <https://doi.org/10.5455/njcm.20200902070715>

- [21] Renée Hannah A. Niro, Via Shereen L. Daracan, Arvin Joseph D. Pizarro, and Josephine D. German. “The Use of Gamification Tools to Boost Students’ Engagement and Motivation”. *Proceedings of the Second Asia Pacific International Conference on Industrial Engineering and Operations Management Surakarta, Indonesia*, September 14-16, 2021.
- [22] Sailer, M., Hense, J., Mayr, S., Mandl, H. “How gamification motivates: An experimental study of the effects of specific game design elements on psychological need satisfaction”. *Computers in Human Behavior*, 69, 2017, pp. 371–380. doi: 10.1016/j.chb.2016.12.033.
- [23] Salguero, A., Alvarado, C., Griswold, W. G., Porter L. “Understanding Sources of Student Struggle in Early Computer Science Courses”. In: *Proceedings of the 17<sup>th</sup> ACM Conference on International Computing Education Research*, 2021, pp. 319–333. <https://doi.org/10.1145/3446871.3469755>.
- [24] Serafeim A. Triantafyllou & Christos K. Georgiadis. “Gamification Design Patterns for User Engagement”. *Informatics in Education*, 2022, Vol 21, No 4. doi: 10.15388/infedu.2022.27, 2022, pp. 655–674.
- [25] Stewart W.H., Lowenthal, P.R. “Distance education under duress: a case study of exchange students’ experience with online learning during the COVID-19 pandemic in the Republic of Korea”. *Journal of Research on Technology in Education*, 54, 2022, pp. 273–287.
- [26] Vieira, E., Silveira, A., Martins, R. “Heuristic evaluation on usability of educational games: A systematic review”. *Informatics in Education*, Vol 18, No 2, 2019, pp. 427–442. doi: 10.15388/infedu.2019.20