

Research Article

BizzMaths: A Gamification Strategy using Genial.ly

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Abstract: Nowadays, game-based learning (GBL) is one of the modern trends in teaching and learning education. GBL is an educational approach that incorporates elements of games into the learning process. It is designed to engage and motivate students while facilitating the acquisition of knowledge and skills. The GBL approach is used to stimulate and motivate the students to participate more actively in the learning process so that it is more enjoyable. Besides, it is also to assist the students in comprehending the lessons more effectively. Consequently, this study aims to develop and implement a digital mathematical game using the Genial.ly platform. The game consists of six activities which are known as Introduction, Quiz, Find!, Correct Image, Select, and Reward which cover the topics of simple interest, and compound interest in business mathematics subject. The developed games are appropriate for students who are interested or have experienced difficulties in studying basic theory in business mathematics. As an extension of this innovation, this developed game allows users to be more flexible concerning time, place, and learning methods. The participants included 35 students who were all taking business mathematics subject. The findings revealed how the activity involving the game led to a significant enhancement in the knowledge and problem-solving skills in mathematical concepts. Hence, this kind of learning method has a greater potential to encourage the students to enjoy learning, to feel comfortable approaching a variety of difficulties along the way, and to overcome these challenges with focus, self-assurance, and patience, all of which are crucial for higher education in the development of lifelong learners.

Keywords: game-based learning; teaching and learning; Genial.ly.



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1. INTRODUCTION

Gaming has gained significant popularity in engaging students in learning processes across all levels of the educational community. Gamification refers to the application of game-based mechanics, aesthetics, and game thinking to engage people, inspire action, boost learning, and solve problems (Kapp, 2012). In addition, gamification can be defined as the use of game elements in non-entertainment contexts to promote learning activities (Nieto-Escamez and Roldán-Tapia 2021). Gamification in education leverages elements commonly found in games, such as points, badges, levels, challenges, and rewards (Gibson et al., 2013; Toda et al., 2020) to make learning more enjoyable and interactive. By incorporating game-like features into the educational experience, educators can tap into students' intrinsic motivation and create a positive learning environment.

Gamification in education offers a wide range of benefits that can positively impact both students and educators. The use of gamification in education can boost student engagement by transforming assignments into fun games that inspire students through rewards when they are successful (Ana et al., 2022). Students engaging in fun and interactive activities are more likely to actively participate, ask questions, and explore concepts further, leading to a greater sense of pride and accomplishment. Apart from that, gamification also encourages more participation from students and has a beneficial impact on students' emotional, behavioural, and cognitive engagement (Zainuddin et al., 2020; Amado & Roleda, 2019; Alsawaier, 2018).

Gamification can be a terrific way to keep users engaged and motivated, especially regarding online platforms and applications. To encourage users to achieve their objectives, it is essential to incorporate elements of gaming and learning materials into the system that both parties can use. The development of gamification software has resulted in the creation of numerous new tools that can facilitate the delivery of an educational experience in the form of a game. For example, Genial.ly, Kahoot, Quizizz, Arcademics, Baamboozle, and Brainscape (Che Ku Mohd et al., 2023).

Genial.ly is one of a cloud-based multimedia content creation platform that provides educators with tools to design visually appealing and interactive learning materials. It offers various exciting and interactive templates to be chosen by educators that are suitable to the course materials. By integrating gamification elements such as quizzes, interactive maps, branching scenarios, and multimedia content, Genial.ly enables the development of engaging educational experiences. However, while the potential benefits of gamification through platforms like Genial.ly are evident, empirical research exploring its impact on student engagement and learning outcomes within specific educational contexts remains limited.

Therefore, this study aims to address this research gap by investigating the effects of gamification using the Genial.ly platform on student engagement and learning outcomes. Specifically, the research objectives include designing and implementing gamified learning modules using the Genial.ly platform, to assess the impact of gamification on student engagement with educational content and to investigate the effectiveness of gamification in enhancing students' comprehension and motivation.

2. DESIGN AND PRODUCT DESCRIPTION

This section outlines the research methodology employed to investigate the implementation and effects of gamification using the Genial.ly platform in an educational context. In this study, we detail the research design, participants involved, overview of the products, and data analysis methods used to assess the impact of gamification through Genial.ly on student engagement and learning.

2.1 Design

The game was designed based on the available template in Genial.ly. This game has been innovated from the “Vibrant Breakout” template to relate to the selected topic. The game is divided into six (6) challenges which are known as Introduction, Quiz, Find!, Correct Image, Select, and Reward as shown in Figure 1. Each component will be unlocked once it is correctly answered. The students need to collect all the numbers (passwords) by completing each of the challenges and enter them in specified order in the final section (reward) to finish the game.

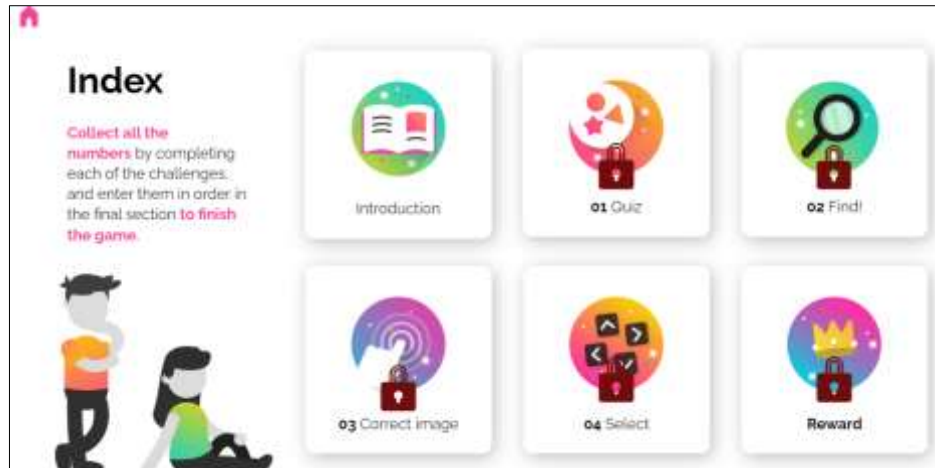


Figure 1. Illustration of six challenges interface.

2.2 Playtest

At the beginning of the playtest, the educators will explain the rules and how to play the game to the participants. The game took about 10 to 15 minutes to complete. Participation is based on voluntary basis, and they are free to quit the game without affecting their final grades.

In this game, participants are required to answer correctly to the question to gather the hidden set of numbers (consisting of four numbers) for each challenge. The numbers will become visible for each challenge, as depicted in Figure 2, only after the question has been fully answered.

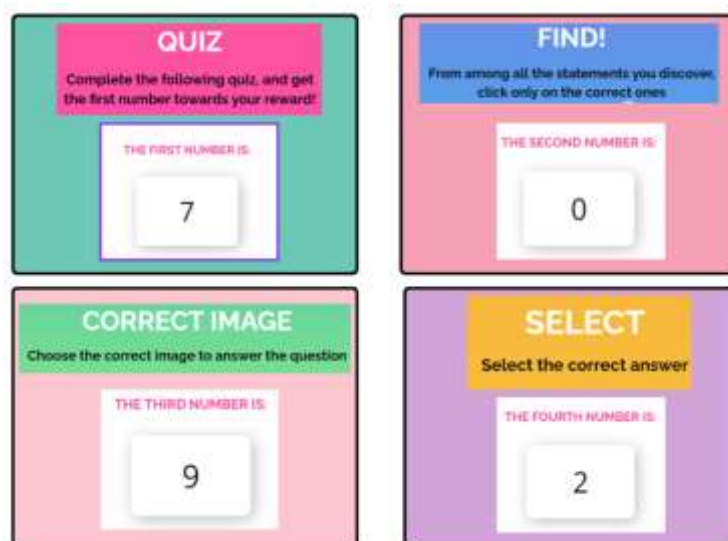


Figure 2. The collected numbers for each challenge.

However, at the beginning, participants must go through the "Introduction" phase to initiate the game and unlock the next challenge. The "Introduction" offers an educational video related to the concept of simple interest and compound interest, making it an ideal resource for exam review. The video comprehensively addresses all the key points that students need to know and breaks them down into easy-to-understand sections. The video provides exciting content that can be a valuable resource, enjoyable, and efficient tool for revising the material.

To obtain the initial number in the Quiz, participants are required to respond to five questions that revolve around fundamental terms within the field of interest, including maturity value, borrower, lender, and a term measured in years. In the subsequent challenge, referred to as Find!, participants must drag the light to uncover the darkness containing the accurate statement tied to the concept of interest and principal amount. Moving on to the third number in the fourth challenge, labelled as Correct Image, participants are tasked with selecting the appropriate image to address a query linked to both simple interest and compound interest. Lastly, in the Select challenge, participants will encounter three multiple-choice questions that demand their comprehension of employing the correct formula for calculations to get an accurate solution. After gathering all the numbers, participants will sequentially input them in the Reward challenge, concluding the game as illustrated in Figure 3.

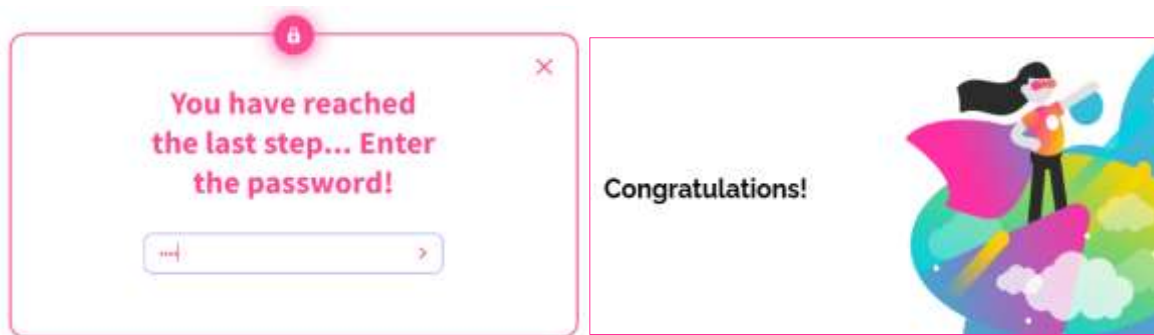


Figure 3. Reward challenge interface.

3. DATA AND RESULT ANALYSIS

In this section, we will provide an overview of the participants involved in the study and discuss the evaluation of the research based on their online gamification feedback.

3.1 Participants

The participants in this study were diploma and degree students from UiTM Cawangan Negeri Sembilan who enrolled in the Business Mathematics course. There were 35 students invited to participate at the end of the semester in a revision for the selected topic, namely simple interest, and compound interest. They were given the link to the game and needed to answer all the questions.

3.2 Evaluation

After completing the game, participants are required to answer the questionnaire to attain a student's perspective on the effectiveness of gamification in learning the designated subject. The survey reveals that over 80% of the participants favour the utilization of gamification methods in their educational activities due to the ability to spark greater interest in mathematics as it is attractive, easy to access, and enhance problem-solving skill as shown in Figure 4.

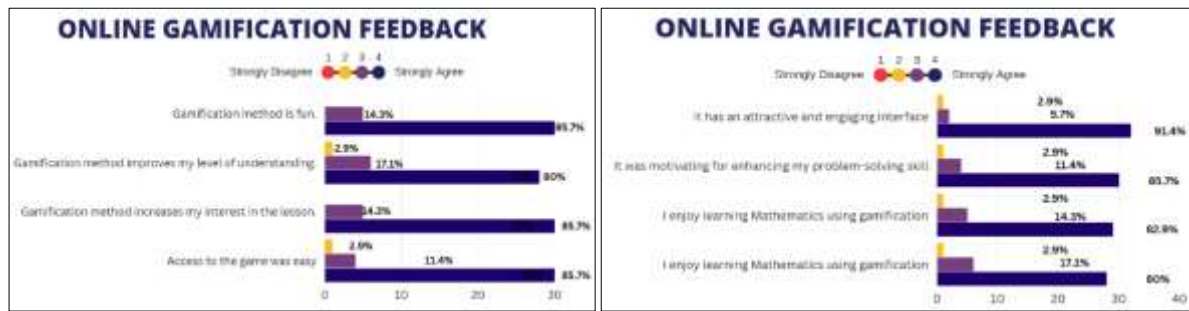


Figure 4. Analysis of online gamification feedback from students.

Thus, integration of game elements into the educational process has proven to be highly beneficial. It is not only enhancing engagement and motivation but also improves comprehension and heightened interest in the subject among students leading to a significant improvement in students' understanding of mathematical concepts. This indicates that gamification holds significant potential as a pedagogical tool for making mathematics more accessible and appealing.

4. NOVELTY

This interactive gamification in education lies in its ability to transform traditional learning methods by incorporating game elements and principles into the educational experience with a more flexible learning approach concerning time and place. It is user-friendly for any device and is a freely available online platform that can adapt to individual learning styles and paces, providing customized experiences for each student. This personalization enhances the novelty of the educational approach. Besides that, gamification leverages elements such as points, badges, leaderboards, and rewards to engage students and motivate them to actively participate in their learning. It taps into the inherent desire for achievement and competition.

5. CONCLUSION

The use of Genial.ly which integrates game mechanisms is the best tool to enhance students' engagement in learning mathematics. The game is easy to access through an interactive virtual platform. According to this study, most students indicated they enjoyed learning mathematics in a fun way. Additionally, gamification activities carried out via online communication channels have produced a fresh and distinctive method of igniting student learning and may be applied to a range of mathematical education in the future.

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