

Digital Escape Room: Students' Perceptions as an Educational Tool in Learning Reading Skills

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Abstract

Conventional teaching method that lacks engaging activities for students could become a challenge in learning. Though past literature on the use of digital escape room in classroom is growing, studies related to digital escape rooms in the field of social science such as English language are still in need. As students' beliefs and perceptions are important in the ability to learn the language, this paper seeks to study students' perceptions of digital escape room as an educational tool in learning reading skills. This study aims 1) to explore the students' perceptions of digital escape room as an educational tool in learning English reading skills and 2) to discover the difference in the mean level of perceptions for differing genders and faculties. A quantitative study was carried out on 212 ESL tertiary students from three faculties. Data from questionnaires was tabulated and analysed using Statistical Package for the Social Science (SPSS). The findings revealed that students' perceptions of the digital escape room in learning reading skills were optimistic. They viewed the escape room as fun, helpful and useful to be applied in other courses as well. It was also unveiled that there was no significant difference in gender or faculty among students who played the escape room. The results of this work provide empirical evidence that digital escape room can serve as a learning method in teaching English reading skills that can benefit students regardless of their gender and educational backgrounds.

Keywords: teaching method, gamification, digital escape rooms, reading skills

1. Introduction

1.1 Background of Study

Gamification is a potential technique in creating an engaging e-learning platform and increasing learners' participation. According to Nevin et al. (2014), gamification is a method of education that engages students and aids in goal-accomplishing by utilising components of gaming, such as problem-solving and environmental limitations. It has become a method to transform learning experiences into a game. This approach is becoming more prevalent in educational and learning contexts, which encourages critical thought on the creation of initiatives that transform students' educational experiences (Garone & Nesteriuk, 2019). Additionally, Suppan et al. (2021) revealed that, during the pandemic, the usage of serious educational games increased, helping to create a new online approach to replace the prior face-to-face activities.

Escape rooms have a direct connection to gamification because of their entertaining aspect and encourage positive behaviour (Kapp, 2012). Among few other terms which are used interchangeably with escape rooms include breakout games, unlock games, and exit games (Krekhov et al., 2021). In an escape room game, a group of players enters a physical or virtual environment where they must work together to solve a mystery or an issue (Zaug et al., 2022). Typically, they move through one or more rooms in search of clues and solve puzzles. With their ability to be used on a variety of topics and as a supplement to other teaching techniques, escape room games are adaptable tools for the development of professional competencies in higher education (Anguas-Gracia et al., 2021).

There are several types of escape rooms, including real-life facilities, digital versions, and board games. The basic concept of the digital escape room is like the physical ones whereby to escape a locked room virtually, players must solve a variety of complex puzzles. Digital escape rooms were used and became more widespread during the COVID-19 outbreak, as they bring beneficial learning outcomes to the learners (Vestal et al., 2021). Since then, a variety of digital education methodologies were consequently integrated into higher education (Kaup et al., 2020) including gamification and flipped learning. As a result, several countries throughout the globe, including Malaysia, have started to adopt this method of learning.

1.2 Statement of Problem

Undeniably, gamification, especially digital escape rooms, has become a popular tool used in all fields to accommodate teaching and learning due to its positive effects. A study by Makri et al. (2021) identified that the use of digital escape rooms as an innovative teaching tool has revealed a connection between learning and affective abilities like enjoyment, curiosity, satisfaction, engagement, and motivation. In general, using games in the classroom has been regarded as one of the most effective ways to engage students and boost their enthusiasm while they are learning (Millis et al., 2017). Furthermore, Dehghanzadeh et al. (2019) reviewed that most of the studies reported that the use of gamification in learning English as a second language is described as interactive, fun, and interesting and it gives positive effects on learners' experiences. Besides, according to Wu and Huang (2017), gamified learning environments also boost students' motivation and enthusiasm for learning English. In another study by Kuo et al. (2022), it was reported that other than motivating the students to study more (particularly their affection and executive volition), escape room could also help children think more creatively and achieve further academically.

However, Gentry et al. (2019) claimed that gamification may limit players' abilities to communicate with their peers and engage in conversation and discussion. In addition, even

though literature regarding the usage of educational escape room is increasing, studies focusing on reading skills are still sparsely explored. Furthermore, though abundant studies revolving around gamification in learning specifically on how escape room can be beneficial in educational classrooms have been carried out, they are still lacking in the arts and humanities field (Fotaris & Mastoras, 2019; Spreen & Vu, 2013). Moreover, in language learning, Husniyah (2019) revealed that one of the factors that influenced students' demotivation may be connected to the learning environment, which is boring learning materials. Therefore, this paper aims to study the students' view on the usage of gamification such as digital escape rooms as an educational tool in language learning, focusing on reading skills. This study seeks to answer the following questions:

1. What are the students' perceptions of digital escape room as an educational tool for learning English reading skills?
2. Is there any difference in the mean level of perceptions for differing gender and faculty?

2. Literature Review

Today's world has witnessed diverse changes that may affect the educational process with a rising number of experts and researchers promoting games as a promising platform of instruction that can both engage students and strengthen important skills in the current information age. Presently, integrating games in language classrooms has become a trend with various elements injected to make the games enjoyable yet meaningful.

In the current situation where students are engaged and exposed to different kinds of learning and teaching approach with the injection of technology, gamification and game-based learning are among the strategies used. This is to divert the traditional teaching and learning process to a more engaging and meaningful classroom with a touch of technology (Thiell, 2022) due to the reason that students are inclined to remain inactive, and their attention span becomes low and lasts for ten to fifteen minutes only after the academic lecture (Benjamin, 2002; Wankat, 2002). This is supported by Abusa'alek and Baniabdelrahman (2020) who stated that it is not adequate to teach English skills as it was in the past, traditionally, and out of date. Thus, it is an enduring need to improve teaching approaches to enhance students' performance in English, in general, especially reading comprehension, to make them active and driven in learning.

The inability to understand certain words could impede students' comprehension. In fact, most second language learners still find reading a difficult skill to master despite many years of English formal education in school (Sidhu et al., 2018). One of the reasons may be that they lose interest in learning the reading skill itself though it is the fundamental criterion for achieving reading goals (Wigfield et al., 2015). As supported by Becker et al. (2010), reading interest leads to positive reading achievements and this can be fulfilled by changing the way reading skills are taught in class. It is vital for teachers to provide students with a conducive learning setting where they cater to their students' interests with a fun and engaging learning environment. Therefore, gamification is seen as the key to solving the problem and has the potential to develop language skills by making learning fun (Mee et al., 2022).

Gaming can create a dynamic that can instigate students to develop skills and competencies as they focus on the activities of the game. As claimed by Dugnol-Menéndez et al. (2021), gamified activities intend to encourage students' behaviour while boosting the pleasure of learning, and subsequently, improving the academic performance and motivation of the students. Students learn more effectively when presented with game-based activities. Gamification in second language learning is convenient to promote exciting and effective

learning experiences and can be used to make students become driven as it gives opportunities for students to practice the language rapidly and obtain skills that can be useful to unravel various tasks (Figueroa-Flores, 2015).

One of the most used games in language learning is Escape Room. According to Nicholson (2015, p. 1), escape room is “live-action team-based games where players discover clues, solve puzzles, and accomplish tasks in one or more rooms, to accomplish a specific goal, usually escaping from the room, in a limited amount of time” which offers a non-traditional, pragmatic, peer-group learning opportunity that nurtures productive connections (Monaghan & Nicholson, 2017). Based on a study by Montoro et al. (2020), humans learn more effectively when game-based activities are implemented and an escape room can be one of the activities based in a game that is suitable to highlight the term gamification, as an attractive learning technique for students. In the study presented by Lama (2018), educational escape rooms can be viewed as a learning environment that is creative and suitably designed for students at all levels as it features educational elements and incorporates learning purposes. Furthermore, Macías and Rocío (2017) mentioned that the implementation of an escape room in English with high school students is regarded as an effective stimulator for students’ involvement in learning activities which proves the educational value of this strategy.

According to Wiemker et al. (2015), escape rooms comprise of puzzles that are characterised as a mental approach because they are based on the use of reasoning and logical thinking of the students. Educational escape rooms place students in direct contact with each other and necessitate them to cooperate; consequently, escape rooms are good activities to augment an in-person classroom setting while cooperative and collaborative skills are enhanced during play due to the nature of the escape room game (Gordon et al., 2019). Related previous studies have discussed the successful practices of using gamification in learning. For instance, students who engage in gamification gain better academic performance and motivation (Su, 2019). Several studies (Brown et al., 2019; Gómez-Urquiza et al., 2019) done on the implementation of escape rooms as an instructional tool in teaching highlighted that students could feel the motivation, excited and fun when attempting to solve the planned conundrums, as well as their practicality in encouraging cooperative teamwork in an engaging environment.

Existing literature about escape room and their usefulness has shown extensive findings involving primary to tertiary education, in all fields like nursing and programming, and they showed high engagement with new skills and knowledge acquisition (López-Pernas et al., 2022). Even though studies about escape rooms are expanding, they concentrate mostly on areas related to STEM disciplines and medicines (Morrell & Eukel, 2021; Sánchez-Martín, 2020; Fuentes-Cabrera et al., 2020; Edwards et al., 2019; López-Pernas et al., 2019) and lacking in arts and humanities field (Fotaris & Mastoras, 2019; Spreen & Vu, 2013). While most research focuses on the benefits of digital escape room, how the field of study and gender affect the students’ perceptions may still be inadequate. Codish and Ravid (2017) claimed that as gamification includes hedonic and utilitarian motivation, gender differences do exist in gamified learning. In past studies, women were not as motivated as men when playing games (Eickhoff et al., 2012; Pedro et al., 2017) while in another study, female users perceived gamification as more playful than male ones (Koivisto & Hamari, 2014).

Thus, this study aims to investigate the perceptions of the students in using digital escape room as an educational tool in learning English reading skills and explore if there is any difference in perceptions between different genders and faculties. It is generally assumed that escape room may immerse students in active learning since they will apply the knowledge that they obtain from the lecture, in the game that they play.

3. Methodology

3.1 Participants and the Setting

Two hundred and twelve students from a public university participated in the current study. They were ESL students who enrolled in English reading classes in their second semester. The pre-requisite to taking this class is to pass their English class when they were in the first semester. These participants came from eleven groups of three different faculties: (1) Faculty of Accountancy, (2) Faculty of Applied Sciences, and (3) College of Computing, Informatics and Media. The English class was carried out twice a week, equivalent to a 2-hour class per session. It is a compulsory subject which emphasises on English reading skills such as skimming and scanning, reference words, contextual clues and paraphrasing besides other basic skills like listening and speaking. The digital escape room aims to strengthen the students' reading skills and improve reading comprehension while engaging them in an interesting and motivating learning experience. The digital escape room was administered three times throughout 14 weeks. After a reading skill was taught to the students, they were instructed to do some reading comprehension exercises related to the skill learnt. Only then, students were instructed to do the digital escape room individually in class to enhance students' understanding of the lesson of the day.

3.2 Design

Instead of employing the old-fashioned way of learning with paper and pen, the escape room was designed to test students' understanding of English reading skills in a more exciting way. They had to use the reading skills learnt in class to crack the code and escape from the room. All participants were assigned to do the digital escape room by their class lecturer. Each game consists of two reading skills. These skills were learnt before they played the game. A link to the escape room was shared via students' official learning platform for easy access. To play the game, they could opt for a laptop or a smartphone whichever they deemed comfortable in finishing the game.

The digital escape room was developed using Google Slides as it is convenient to work with and is user-friendly. It is inspired by Walnum (2022) who featured reading escape room as one of the escape rooms that suits all ages, and the themes are inspired based on Duske (2022). The themes and reading skills tested are summarized in Table 1 below.

Table 1. Summary of the Digital Escape Room Activity

Week	Theme	Reading skill
Week 4	Trap in classroom	Structure of a Passage Contextual Clues
Week 7	Guessing the pirate's name	Reference Words Paraphrasing
Week 10	The kidnapping	Fact and Opinion True or False

Once the students clicked on the shared link, they would see a front page which instructed them to get ready for the game (Figure 1). It is important to get them ready mentally as they have never been introduced to the concept of learning through escape room, especially in a classroom setting. During the game, they were not allowed to use smartphones to seek the answers but were permitted to discuss, move around, and collaborate with their friends. They were instructed to prepare a pen or pencil and a paper to write the code. The students were

informed that once they clicked the button to play, a 20-minute countdown timer would begin.

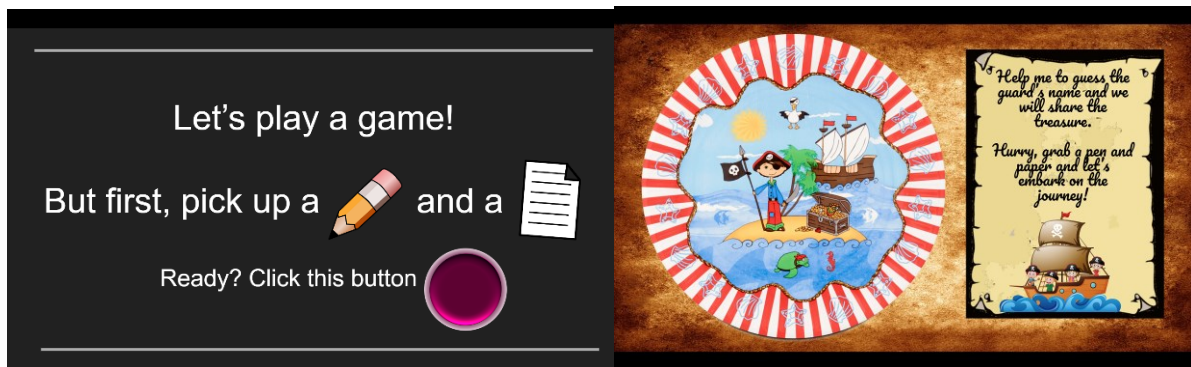


Figure 1. Screenshots of the Introductory Page of the Digital Escape Room

Next, they would see the introductory screen of the main play area where all the hidden questions were located. These questions were hidden throughout the room and within the time given, the players had to find the questions and answer them correctly. The answers to the questions would be the clues to escape from the room. Before they began, they had to click on the door or the figure to read the instructions given (Figure 2).



Figure 2. Screenshots of the Main Play Area

Once they clicked the door, the students would see a Google Form (Figure 3) which entailed the clues that they needed to find. It would also determine the number of questions that they had to find and answer in the room. The code could be in the form of numbers, letters or alphanumeric. When they were clear with the instructions, they were instructed to go back to the main play area to find the clues. This step was controlled and guided by the class lecturer and was carried out simultaneously with all students.

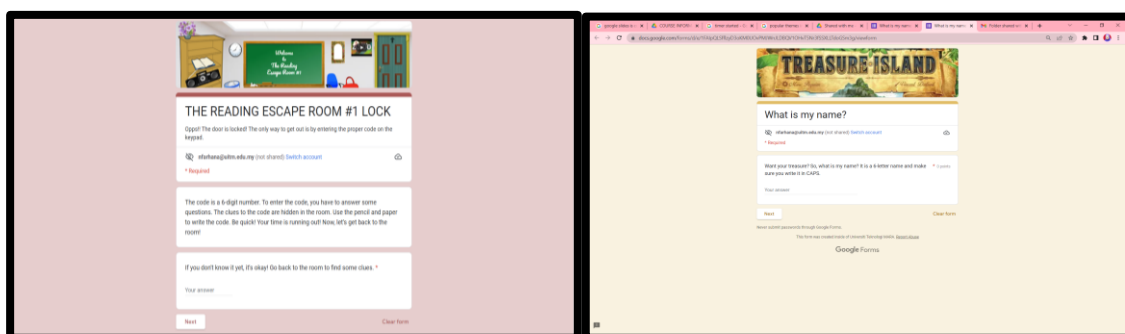


Figure 3. Screenshots of the Code Page

In the main play area, the questions were hidden and scattered. Some items in the room could be the reading questions which they had to answer while others could be red herrings like songs or pictures that were intended to distract the players. The questions were based on the reading skills they learnt before. If the students got the questions (Figure 4), they had to answer them correctly to enable them to retrieve the right code and finally escape from the room. Unlike subjective or open-ended questions which require students to provide elaborate and varied answers, this escape room was designed with multiple-choice questions which demand its players to find answers that are objective and definite. It is also easier to lead students throughout the game and they will be able to find the correct code eventually. All questions were based on the skills they learnt in the reading class. These questions were designed and validated by English lecturers from the course before they were used in the game.

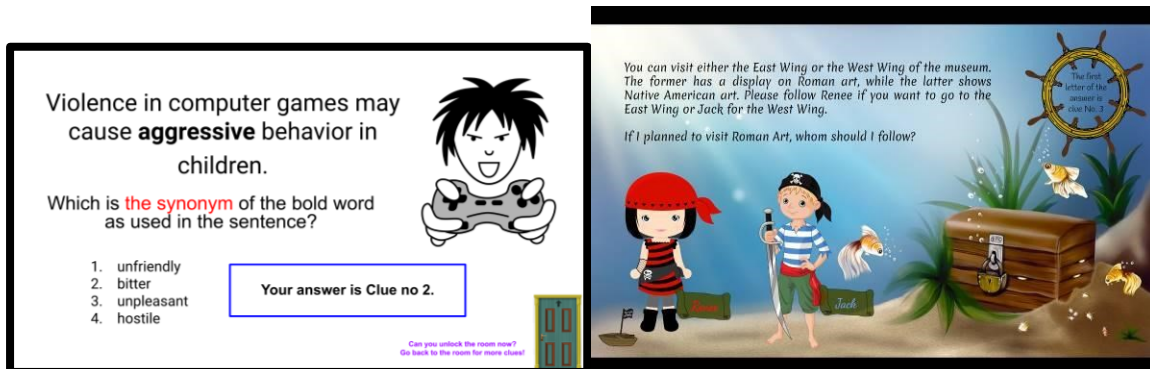


Figure 4. Screenshots of Reading Question Samples Based on the Reading Skills Taught

Once the students manage to complete the code, they must get back to the form to fill in the answer. If the students manage to get the code correctly, they are led to another page (Figure 5) to show that the code is correct. If the code is wrong, a pop-up sign will appear indicating that the code is wrong, and students must redo the questions until they get the right code to escape from the room.

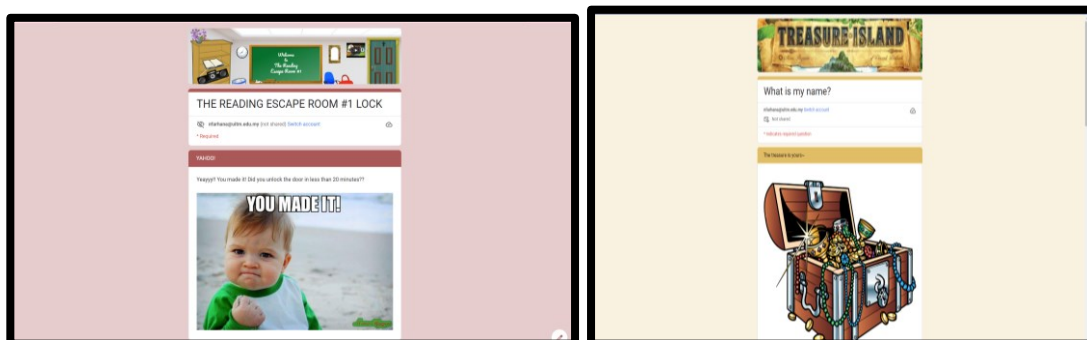


Figure 5. Screenshots of the Opened Door

This game must be played in class to ensure that the game is played in a controlled classroom setting. After playing all the games, students completed an anonymous feedback survey adapted by López-Pernas et al. (2019). The questionnaire was aimed to gather students' opinions of the digital reading escape room. It was conducted one week after they finished all three games. It was carried out in class and was observed by their class lecturer. The questionnaire was divided into two parts: (A) Demographic background and B) Perceptions of the reading escape room. Part A entailed initial demographic background like faculty and

gender. For part B, there were several closed-ended questions addressing students' general opinion, their acceptance of the game and a list of statements which they had to agree or disagree with using a 5-point Likert scale. Some of the statements were deleted and adapted to suit the purpose of the study. Then, the difference in mean level between genders and faculties was analysed using Two-way-ANOVA. The results gathered were quantitatively tabulated and analysed using Statistical Package for the Social Science (SPSS) version 21. The findings were presented in tables as shown in the next section.

4. Findings and Discussion

There are two research questions highlighted in the present study. The first research question is as follows:

RQ1: *What are the students' perceptions of digital escape room as an educational tool in learning English reading skills?*

To answer the first research question, students' general opinion on the educational escape room and their perceptions of the digital escape room in learning English reading skills are presented in the figures and table below respectively.

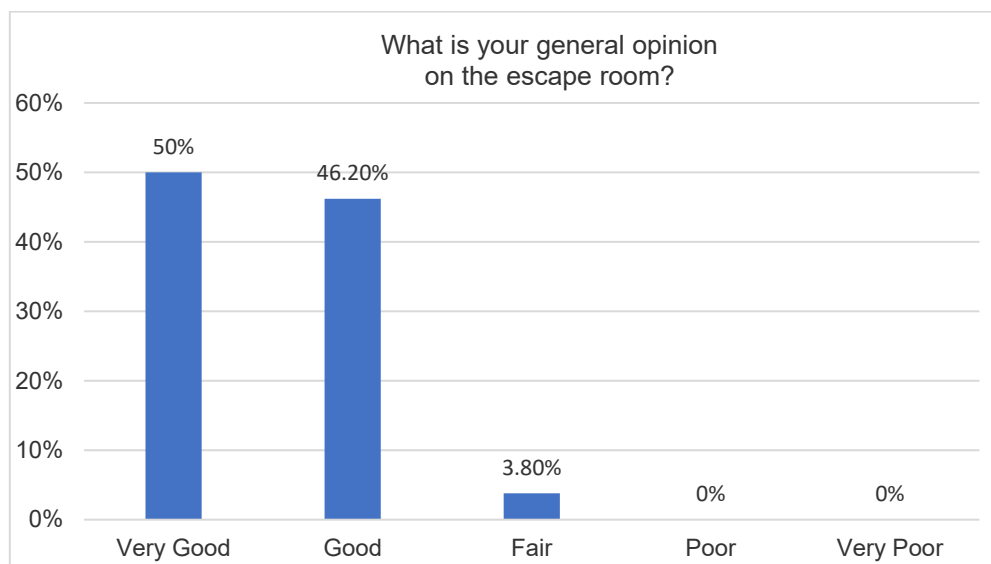


Figure 6. The General Opinion of Students on the Digital Escape Room

Figure 6 shows the results of the students' opinions on the concept of escape room in general. It shows that the students have a very positive overall opinion of the digital escape room with half of them (50%) viewing the escape room as very good. Moreover, almost all the students (95.8%) stated that they would like other courses to include escape room as one of the learning activities in class. The students' optimistic attitude towards the escape room itself confirms that the escape room can be viewed as one of the learning methods in teaching students regardless of any subject or course. It is aligned with previous studies (López-Pernas et al., 2019; Dugnol-Menéndez et al., 2021) that utilised escape room as a teaching tool in other disciplines. This is because gamification in learning specifically the escape room does not only provide students with basic knowledge of the lesson learnt, but it allows students to develop their social skills when they communicate with each other to solve the mystery (Stone, 2016) where such skills must be applied in all classes. Furthermore, escape room also enhances students' learning as it

increases the level of students' engagement. While an educational escape room is a novel approach to stimulate one's learning, an escape room is also flexible and can be designed according to students' learning outcomes. Teachers can choose to set up their educational escape room by creating their own materials and stories to achieve the learning goals. Positive responses from the students show that educators can employ an escape room game as an additional teaching approach and customize it based on students' interests to make it fun and enjoyable, specifically for English language class.

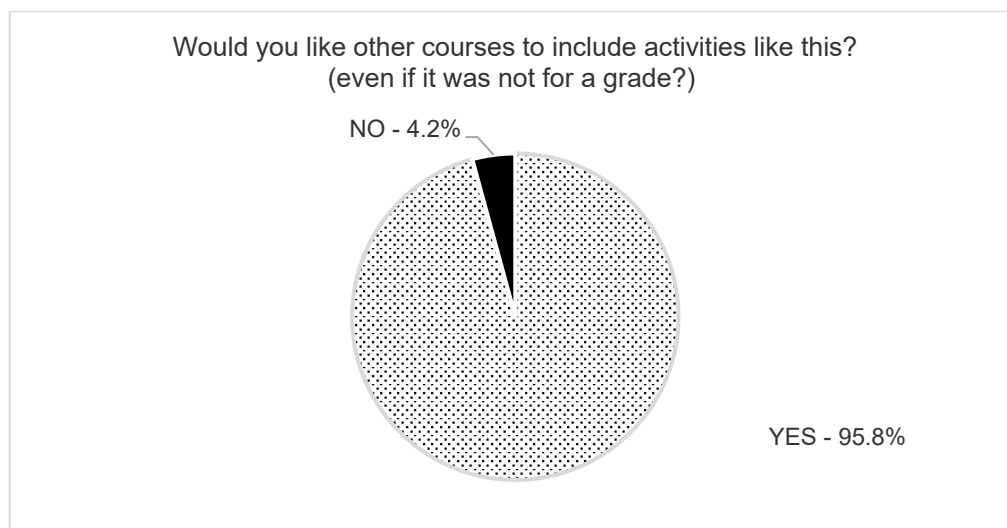


Figure 7. The General Opinion of Students on the Digital Escape Room for Other Courses

Table 2. Results of the Students' Perceptions of Digital Escape Room as a Tool in Learning English Reading Skills (N=212)

No.	Mean Score	Mean Score	Std. Deviation
1.	The escape room allowed me to improve my knowledge of reading skills.	4.5047	.57183
2.	I learned more with the escape room than I would have with a traditional learning classroom	4.2123	.77106
3.	I liked the escape room better than a traditional learning classroom.	4.2217	.79268
4.	The escape room was fun for me.	4.6038	.58705
5.	The escape room was a real-life situation experience.	4.0330	.81097
6.	The escape room was a stressful experience.	2.8821	1.25825
7.	The escape room was too hard.	2.8491	1.13365
8.	The difficulty of the escape room lies in mastering the reading skill.	3.9623	.87541
9.	I think I was prepared enough to succeed in the escape room.	3.7453	.79168
10.	The escape room was well-organized.	4.2972	.72947
11.	The duration of the escape room was adequate/enough.	4.1840	.71486
12.	The hint approach was adequate/enough.	4.1981	.69418
13.	I wish I received more help from my lecturer during the escape room.	3.4811	1.00455
14.	I wish I received more help from my friends during the escape room.	3.5802	.95301
15.	The initial guidance provided was enough.	4.1651	.68574
16.	The supervision of the activity was adequate.	4.1462	.69003
17.	I would like more types of questions asked	4.2500	.81963
18.	I liked participating in the escape room with a classmate.	4.4575	.67669
19.	I would rather have participated on my own.	3.1840	1.03454
20.	I would rather have been part of a larger team.	3.6132	.96450

Based on the table above, the students were convinced that playing escape room was a fun experience ($M=4.60$, $SD=0.58$) and thought that the escape room allowed them to improve their knowledge in reading skills ($M=4.50$, $SD=0.57$). The participants also positively preferred to participate in the escape room with a classmate ($M=4.46$, $SD=0.68$). It is crucial for students to learn a language with positive emotions that spark joy and interest in learning. Many studies have revealed that some of the factors of boredom in English language classrooms are due to teacher-centred and rote learning (Hill & Perkins, 1985) as well as poorly designed, unchallenging, and repetitive tasks (Larson & Richards, 1991; Harris, 2000; LePera, 2011). Reading tasks in English language classes was found to be one of the activities that was boring and dull (Pawlak et al., 2020). Thus, students' positive perceptions of escape room as being fun and enjoyable could evidently show that escape room creates a better learning experience for the students particularly in their reading class. When they feel happy and are pleased with the environment, opportunities for students to be a part of active learning and social interaction will take place. In fact, educational escape rooms have been reported to increase students' academic achievement and develop their knowledge acquisition (Brusi & Cornellà, 2020; Sánchez Lamas, 2018). This means that gamified activities such as escape room can increase students' feelings of enjoyment and happiness which, consequently, improve students' academic achievement.

As proven by previous studies (Figuroa-Flores, 2015; Dichev et al., 2020; López-Pernas et al., 2019), gamification in learning such as escape room increases students' motivation in learning as they feel more driven to learn and improve themselves. As the results in Table 2 revealed, students believe that they learned more in the escape room than traditional learning classroom ($M=4.2$, $SD=0.77$) and prefer the escape room method better than the traditional one ($M=4.2$, $SD=0.79$). Traditional learning method that is known to be lacking in terms of experiential learning, learner-centred approach and inflexibility has caused students to lose focus in learning which could be detrimental to their academic performance. Furthermore, individual skills such as communication and teamwork may be difficult to reach with traditional methods (Andreu-Andrés & García-Casas, 2014) and it is the teachers' responsibility to help them with the necessary skills needed. In fact, traditionally, reading skill is known as a passive activity where teachers usually employ a teacher-centred approach while teaching (Kaya, 2015). Students are expected to read texts and answer questions that follow which may not be a meaningful learning to some students. As teaching strategies play a significant role in reading acquisition (Brown, 2004), educational escape room is perceived as a method to encourage students to learn reading skills. While playing, students are more likely to communicate with their friends because of the nature of the game which needed them to solve a series of questions within the time given, allowing them to participate, collaborate, and motivate one another. Most importantly, when students play the escape room, they feel engaged, making them do meaningful learning activities as they think about what they are doing (Bonwell & Eison, 1991). As they communicated, the students would discuss and figure out how to solve the questions together.

They also somewhat agreed that they wished that they received more help from their lecturer ($M=3.48$, $SD=1.00$) and their friends ($M=3.58$, $SD=0.95$). It means that even though they are learning using digital escape room, guidance and assistance are still significant in the learning process. It shows that though the digital escape room was carried out in a face-to-face setting, class teachers or instructors still act as facilitators to support and encourage students to collaborate and support each other while making sure that they complete the task. Students' success relies on how active they are in class together with the role of teachers in cultivating skills such as leadership skills, creative thinking, and communication (López-Pernas et al.,

2019). Such results suggest that escape rooms can engage students in synchronous and asynchronous settings as well as online and physical settings (Neumann et al., 2020; Clapson et al., 2020; Edwards et al., 2019), however, students participation requires additional effort from the teachers and instructors.

RQ2: *Is there any difference in the mean level of perceptions for differing gender and faculty?*

To answer the second research question, the mean level of perceptions for differing gender and faculty are shown in Table 3. The result in the table below indicates that there is no statistically significant difference in perception levels among genders (p-value: 0.245) and faculties (p-value: 0.587) at a 5 percent significance level. In addition, the interaction term between genders and faculties is also found to be not statistically significant (p-value: 0.067) at a 5 percent significance level. This implies that there is no substantial interaction effect between genders and faculties on the level of students' perception of digital escape room as an educational tool in learning English reading skills.

Table 3. The Mean Level of Perceptions for Differing Genders and Faculty

Single and Interaction Effect	Mean Square	F	Sig. Level
Gender	.442	1.362	.245
Faculty	.173	.534	.587
Gender x Faculty	.889	2.739	.067

The results contradict with previous findings (Eickhoff et al., 2012; Pedro et al., 2017; Koivisto & Hamari, 2014) that there are differences between genders in playing games. However, the results are consistent with past studies (Nicholson, 2015; Clarke et al., 2016; López-Pernas et al., 2019) that there are no differences in the students' opinions on the use of gamification in education, particularly in using escape rooms, as they are perceived well regardless of their gender. This study, moreover, aligns with several past studies that have revealed the positive effects of escape room on academic achievement and student participation in both male and female participants (Macías-Guillén et al., 2021; Gómez-Urquiza et al., 2019). Furthermore, the result also indicates that there is no difference in opinions among the participants in different faculties, thus confirming the positive benefits of gamified learning in several disciplines.

5. Conclusion

Gamification, particularly digital escape room, is widely used in various fields to enhance teaching and learning due to its positive impacts. Using digital escape rooms as a creative teaching method has shown that it can make learning more enjoyable, interesting, satisfying, engaging, and motivating. Overall, using games in classrooms is seen as one of the best ways to get students excited and interested in their learning. Thus, this study intends to understand how students feel about using digital escape rooms to learn English reading skills. It is also to see if there are any differences in how male and female students, as well as students from different faculties, perceive this educational tool. It is expected that the escape room will engage students actively by making them apply what they learn in lectures while playing the game. The findings showed that students had a positive and upbeat view of the digital escape room. They found it enjoyable and saw it as a beneficial tool that could be applied in other courses. Notably, there were no notable differences between male and female students or

students from different academic backgrounds who participated in the escape room activity. Though the findings of the study cannot be overgeneralised due to its small sample size, this study underscores that digital escape rooms can be tailored to accommodate various learning levels and objectives, making them a versatile tool for educators across different age groups and language proficiency levels. This adaptability empowers instructors to customise learning experiences that cater to the specific needs and goals of their students, thus ensuring a more personalised and effective learning journey.

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