Promoting EFL Students' Engagement by Using Bamboozle: Digital Game-Based Learning in Indonesian Higher Education

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Abstract

Digital Game-based learning has been investigated to find the effective teaching strategy and media. However, little empirical evidence addresses how Bamboozle, a web-based game app, promotes language learners' behavioral, affective, social, and cognitive engagement. This study utilized an exploratory case study; seventy-eight EFL students participated in a gamified online course using Bamboozle. They were selected by cluster random sampling technique. This study revealed that the participants were engaged and actively involved in the teaching and learning process. In addition, it is found that students' engagement increased and they were motivated to learn interactive speaking. As the results showed that the students enjoyed the learning process, they were motivated. The students were involved in active participation and discussions. In addition, they were active in collaborative projects. According to the findings, the majority of students have a good opinion of the concept of Bamboozle as a game-based application. The participants were posted in three categories, namely: the highly engaged, the moderately engaged, and the lowly engaged. The higher they engage the better performance that they have in learning English, especially Interactive speaking. The findings suggest the utilization of digital game-based in EFL classrooms should focus more on critical thinking and problem-solving techniques. The implication extends to the broader context of EFL education in a higher learning context, highlighting the integration of Bamboozle as a game-based application to enhance the student's motivation, and engagement and help to more easily understand the lesson.

Keywords: Bamboozle, Students' Engagement, Digital game-based learning, Higher Education

Introduction

Digital game-based learning is viewed as a novel approach to education that has the potential to improve language acquisition by fostering student interaction. According to (Shirmardi et.al 2022), game-based learning is popular among native speakers and can provide language learners with engaging and interesting learning opportunities. They contend that language learners can enhance their cognitive capacities to synthesize, analyze, and evaluate information in their learning through games.

Consistent with the preceding statement, Digital game-based learning can help EFL students become less anxious and encourage an active learning process. Furthermore, Digital games can boost participation and encourage a student-cantered environment. The lecture-based classroom format can be abandoned by professors in favor of game-based learning, which gives students more time for inquiry and independent thought (Tokac et.al, 2019). Additionally, students work more closely and collaboratively with their teachers and fellow students.

Digital game-based learning has become a viable strategy to improve university students' educational experiences. It is thought that by incorporating digital games into the curriculum, students will be able to participate in immersive and interactive learning experiences that foster critical thinking, problem-solving, active learning, and teamwork. But even with the increasing acceptance of digital game-based learning, there are still a number of unanswered research questions (Hsiao, 2007). A thorough knowledge of how particular game mechanics affect student engagement and learning outcomes in higher education is still lacking from this field of research. Furthermore, there is a lack of information in the literature on the merits of various game genres and which academic subjects they are appropriate for. Furthermore, not much research has been done on the possible contribution of digital game-based learning to the resolution of issues pertaining to diversity and culture in university settings.

A learning approach known as "game-based learning" makes use of special game programs to facilitate learning. Students can play as they learn when learning is taking place. Typically, learning occurs in a game that mixes the fantastical and practical aspects. This is done in an effort to improve the problem path's allure as a solution (Rahayu and Rukmana, 2022). In learning through digital games, educators

are crucial. With the help of other classmates' understanding, students can master abstract topics while having fun and enjoying themselves through game-based learning. It also has other aspects of this game-based learning paradigm, such as enjoyment, excitement, and emotional stimulation (Partovi et al., 2019). Moreover, game-based learning encourages participants to acquire knowledge more effectively because the tasks and activities are typically enjoyable. In the sphere of education, gamification and game-based learning are two distinct but connected ideas. Applying game features to non-gaming environments, such as leaderboards, badges, and points, is known as gamification, and it aims to boost motivation and engagement (Saud, et al, 2022).

Moreover, based on the findings of an interview with English language education study program students, it was discovered that many students still struggled with multiplication concepts and were incompetent at performing writing or extracting when face-to-face instruction resumed after a prolonged period of online learning. This is due to a number of factors, including the fact that all institutions engaged in online class while offering online distance learning, which allowed students to be pampered for an excessive amount of time. They tend to wait all the things about the subject from the lecturers. Some lecturers only prepared materials via learning management system without any interactive activities. Lecturers don't directly assess students' ability because they solely supply content via YouTube and insert in the learning management system, assign work without communication or clear instruction. The students tend to be bored because of the monotonous activity or learning activities.

Apart from the facilities given by the advancement of technology, several obstacles were experienced, including low student learning outcomes for some English subjects, and students also tend to be unmotivated, especially in the Indonesian context where English is taught in the classroom as a foreign language. In line with this statement, the researchers have highlighted the difficulty of planning and implementing online learning activities; it may be challenging to boost students' learning engagement and participation in online learning activities (Tsai et al., 2018). Despite the benefits that digital game-based learning provides valuable inputs as language learning partners especially in engaging the students in the EFL classroom. Numerous studies have been conducted across several countries namely: Pakistan, Malaysia, Saudi Arabia, China and Indonesia on the issue of digital game-based

learning from several aspects, for instance, the psychological factor of using digital game-based learning (Ozguzel, 2020); the effect of game-based learning for high school students' (Portovi et al., 2019, Ghobadi et al. 2021, Rahayu, 2022).

Bamboozle is a web-based tool for developing engaging and exciting games that promote the idea that learning should be enjoyable and help teachers to reinforce topics and engage all students in the learning process. Additionally, bamboozle is an intriguing game-based tool that allows kids to collaborate (Rahayu & Rukmana, 2022). As a result, this contest will feature two teams. Not only can the teacher determine the game based on the contents, but they can do so for pleasure. Additionally, students will not get bored with online classes (Saud et al., 2022). Through this game, all learners can engage actively because they will be answering the questions one by one. Additionally, it will be easier for students to engage with the lesson material taught through online learning.

The wonderful thing about Bamboozle is that it has various classroom benefits. First, questions are never repeated and are drawn from a constructed bank of questions. As a result, each game is unique. Second, the games can be tailored to the student's individual demands. Thirdly, students can name their teams, which encourages team development. Fourth, the game may easily be projected onto a screen, which eliminates the need for students to own a gadget. Fifth, no accounts or codes are required for students to participate in the game. Finally, creating games is simple.

The use of Bamboozle in English as a Foreign Language (EFL) training in Indonesian higher education fills in a number of important research gaps and niches. First of all, the material that has already been written about digital game-based learning frequently ignores the use of these technologies in Indonesian EFL classrooms. This research attempts to close a significant gap in the literature by examining the efficiency of gamified strategies such as Bamboozle in this specific context, which has not been well studied. Furthermore, the study explores the unique difficulties encountered by EFL students in Indonesia, including language and cultural hurdles that may not be sufficiently addressed by traditional teaching approaches. With its gamification components, bamboozle provides a customized way to engage students and close these gaps in a linguistically and culturally appropriate manner.
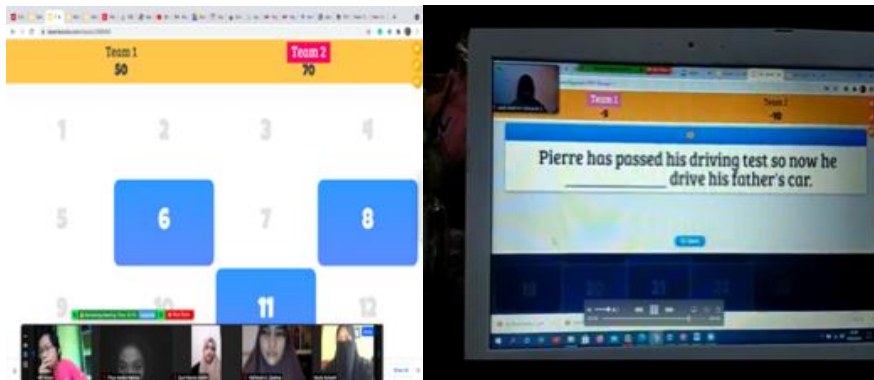
Figure 1. The students were interacting in Bamboozle activity

By offering empirical proof of bamboozler's efficacy in raising EFL students' English language competency in the setting of Indonesian higher education, this study advances the area of language education as a whole. Teachers, curriculum designers, and legislators can all benefit greatly from the study's conclusions, which can help them incorporate gamified learning resources into language training.

Although several studies have been conducted on the issues of digital game-based learning on several aspects, there is an empirical gap in dealing with the measuring and investigating students' involvement and engagement in the classroom especially in Interactive speaking courses. To bridge this gap, this study aims to investigate how digital game-based learning affected the students' engagement of Indonesian EFL learners to learn the language; which is can be formulated as follows:

How does digital game-based learning (Bamboozle) affect students' engagement (affective, cognitive, social, and behavioral) in an online interactive speaking course? What challenges do students encounter when utilizing Bamboozle as a digital game-based learning application?

Moreover, the recent study provides several theoretical and practical contributions to answer these questions. First, it can aid teachers and lecturers in gaining insights and prior knowledge when designing the ELT models for an online class. Second, it is also intended to provide feedback on enhancing the online learning process. Third, the results from this study offer a detailed view of gamification in Interactive speaking, which influences the students' learning achievement. Finally, this study provides insight into the current state of current students' activities during this digital era.

To sum up, this study not only closes important gaps in the literature but also offers insightful information that goes beyond the Indonesian context, promoting a more thorough grasp of the possibilities of digital game-based learning in EFL instruction around the world.

The novelty of this study, the researcher incorporated digital game-based (Bamboozle) as the media in engaging EFL online classrooms. This game allows the students to have a direct impact on the game's direction and results, providing an environment in which gamers possess power or a chance to perform their ability in interacting with the other. Cooperation and competitiveness are expected to reinforce social bonds. However, there is a cautionary note about using competition because it inevitably incorporates components of negative reinforcement and, as a result, may be demotivating for some people (Balm, 2019).

Although extensive research has been carried out on gamification in EFL, no single study exists that investigates the Indonesian EFL students' engagement in learning Interactive speaking using the game-based application that is Bamboozle.

In light of the aforementioned issues, the current study set out to investigate how digital game-based learning affected the students' engagement of Indonesian EFL learners to learn the language; as a result, two research questions were developed:

1. How does digital game-based learning (Bamboozle) affect students' engagement (affective, cognitive, social, and behavioral) in an online Interactive speaking course?

2. What challenges do students encounter when utilizing Bamboozle as a digital game-based learning application.

Research Methodology

In order to successfully accomplish research aims, this study used a mixed-method approach using a sequential explanatory design (Hendren et al, 2023). This study aims to explore how students interact with the use of Bamboozles, a digital game-based tool, and how Bamboozle affects learning in an EFL classroom. It was projected that the use of the game-based app Bamboozle would enhance students' ability in English communication. The Bamboozle was introduced in the fourth semester of Universitas Negeri Makassar's English Language Education Study Program.

The researchers employed purposive sampling technique and there were 78 students involved in this project. They were the students who enrolled in Interactive speaking course. Before the semester began, the online course was gamified. Each enrolled student in Interactive speaking class is divided into several teams. Participants were requested to join every session in the online class which is taught with any topics related to Interactive speaking (Comparing living in a city vs living in a hometown, Discussing about local, national and international issues). The course took 16 weeks to complete. Throughout the procedure, students received technical, content, and practice-related assistance. This study utilized questionnaires and semi structured interview as the main tools to gather the data.

In addition, due to the research design is mixed method so this study consisted of two distinct sessions: a quantitative session is distributing questionnaire to gather numerical data on the students' responses or perception towards the use of Bamboozle as a game- based application in teaching Academic Writing, the questionnaire was distributed via google form. It was sent after having the class which is held by applying Bamboozle as a game-based application. The questionnaire consisted of 20 items. It was divided into positive and negative statements to represent the students' responses or perception towards the use of Bamboozle as a game-based application in teaching Interactive speaking. While a qualitative session involving semi-structured interviews was conducted to gain in depth insights about students' response and the challenges faced by the students in involving the teaching and learning process by integration of bamboozle as digital game-based learning. The interview questions were composed of 8 questions, which aimed to explore the students' challenges in using Bamboozles as a game-based application in academic writing. There were 20 students were recruited to be the participants of that qualitative session. The participants were determined as respondents by their willingness to be involved.

For the qualitative data, individual interview was conducted with participants. Audio recordings were made with participants consent to capture their responses accurately. The researchers followed the semi structured interview guides and facilitated small discussion to explore the students' responses in teaching and learning process.

The researchers used the Likert scale, the data from the questionnaire was analyzed. It sought to evaluate the views of the respondents. The answer to each

Likert scale instrument item that is split into positive statements and negative statements is as follows.

Table 1. Scoring for Likert Scale

Positive statement	Classification	Negative statement
4	Strongly agree	1
3	agree	2
2	disagree	3
1	Strongly disagree	4

In addition, as the qualitative data, the researchers ensure that transcriptions were completed accurately and cross-checking against audio recordings-maintained data accuracy. Then they did first coding: initial coding entails giving descriptive labels or codes to data segments that stand out as intriguing, pertinent, or significant. These codes can identify patterns, concepts, or themes. Third, analyze the data and think about the setting in which the information was gathered and how it affected the interpretations.

Findings and Discussion

Findings

Number of studies have been conducted on the issues of digital game-based learning on several aspects, there is an empirical gap in dealing with the measuring and investigating students' involvement and engagement in classroom especially in Academic Writing courses. To bridge this gap, this study aims to investigate how digital game-based learning affected the students' engagement of Indonesian EFL learners to learn the language, to reveal challenges do students encounter when utilizing Bamboozle as a digital game-based learning application.

Students' Engagement in learning Interactive Speaking with Bamboozle

Based on the survey, most participants (N=40) strongly agreed that the playing with Bamboozle was exciting and enjoyable, thus encouraging and motivating them to participate. They enjoyed working on the project (clue of every

number without experiencing too much stress). In other words, the project has engaged them in the meaning-making processes and made them comfortable with learning beyond the classroom. Despite their exhaustion, most participants did not feel burdened by the task, even though a few students experienced it that way.
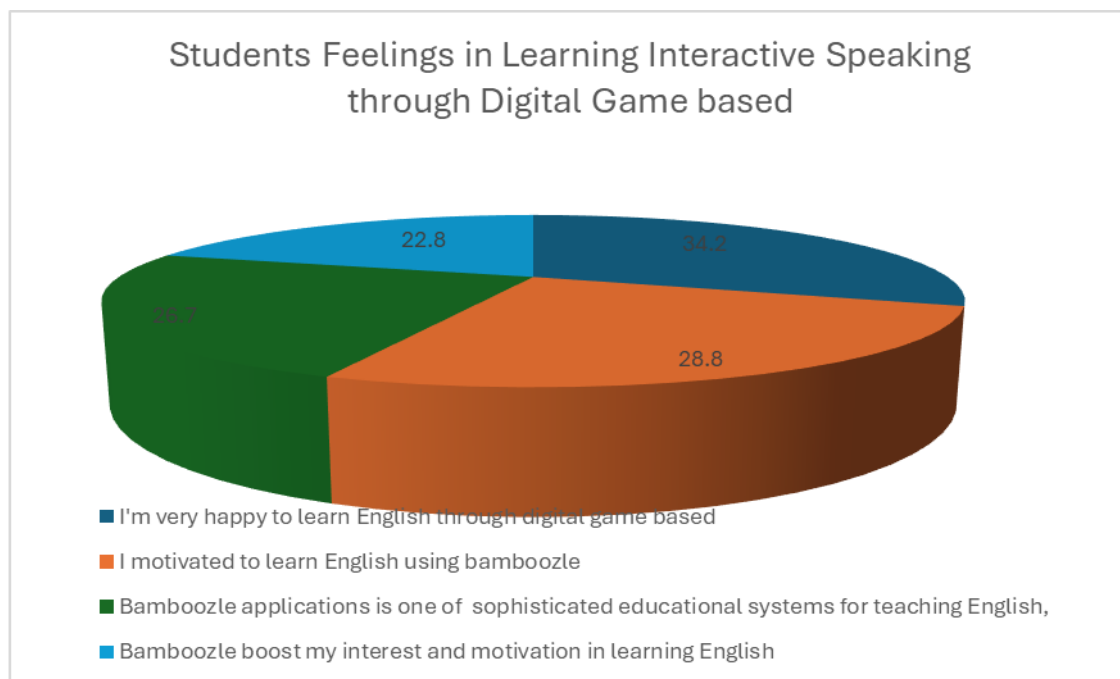

Figure 2. Students' feelings about the Digital Game-based learning

These findings highlight the research subject's feelings of Bamboozle as digital game-based in the EFL classroom. The survey covers the statement of whatever the respondents' feelings are while they are interacting with the Bamboozle. The results show most of the respondents are very happy at 34.2%, happy at 52.5%, and neutral at 12.6%. The statement about the research subject's motivation was 28.8% strongly motivated, 56.7 motivated, and 13.6% neutral. As shown above, bamboozle is one of the sophisticated educational systems for teaching English, stating they strongly agree with 26,7%, agree with 53.7%, and 18.4% were neutral. In the last statement, the subject of the research felt Bamboozle augment my interest and motivation levels in the language teaching process, stating 22.8% strongly agree, 54.9 percent agree and 21.9% were neutral.

Regarding the students' emotional states, most students strongly agreed that the Bamboozle as a digital game based was adaptable, innovative, attractive, facilitating, mediating, engaging, and collaborative. They were able to follow the activity instructions clearly and encountered no serious issues. However, a small number of participants still felt confused and disengaged from the project. Although this number is relatively insignificant, it is vital to understand why it occurred. In addition, some participants are concerned about the activity by applying Bamboozle, it involves the passive and active students. Overall, the project has facilitated the students' learning and encouraged the students' engagement and participation in digital learning encounters.
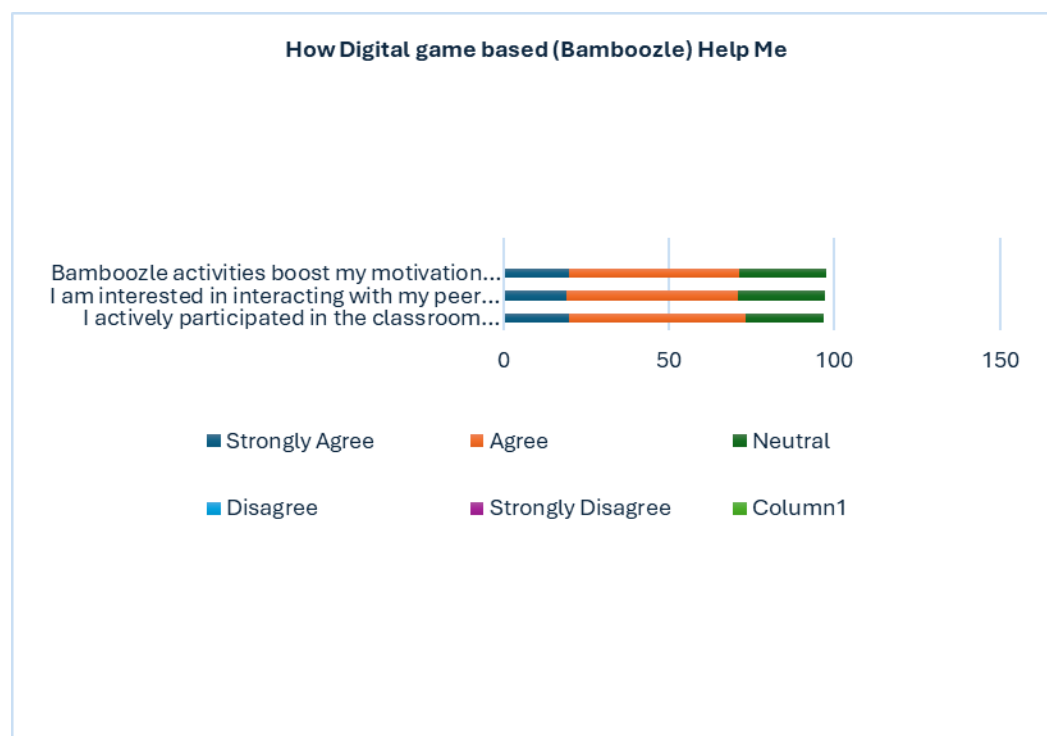

Figure 3. Students' interests about the Bamboozle

When asked whether using digital game-based (Bamboozle) enhances according to the poll cited in figure 7. According to the data, 53.3% of respondents choose to agree with the statement, 19.8% of respondents strongly agree with it, and 23.4% of respondents adopt a neutral stance. 19.1% of the study participants strongly concur with the claim that bamboozle can boost the students' motivation, while 51.9% choose to agree and 26% take a neutral stance. The next survey question involves that the students actively participated in the classroom activities, namely

competition. According to the graph, 51.3% of respondents and 19.8% of respondents firmly agree with the statements.

In addition, the researchers developed some follow-up questions and clarified some critical issues: 1) to what extent answer all the numbers/clues 2) confuse the participants' role? The following snippets were in Indonesian and have been mediated to English to improve their understandability.

FGI participant# 1

"I observed that my friends enjoyed it, but I was   still trying to build my confidence in order to avoid the wrong answer so my team can be a champion".

FGI participant# 2

"I enjoyed participating in gamification activities but was still confused about the roles of myself when I have answered the questions or the clues from the board game of Bamboozle".

Based on the questionnaire result, students agree that the use of Bamboozle in teaching and learning academic writing create a relaxing and pleasant learning environment (3.35), enhance students' awareness and self (3.15), assist students in improving their ability to speak English (3.2), increase students' enthusiasm to study (3.1), improve students' motivation (3.15), and encourage students to be more active in learning (3.4). In addition, online learning materials designed with the integration of Bamboozle lead the students to learn without any boredom. The students are more enthusiastic and engaged in learning English by using gamification (bamboozle), it can be seen from the average score 3.4. In consummation, it is given a grade based on the average questionnaire 3.20 score. It shows that students are enthusiastic about learning English through the use of Bamboozle as a game-based application.

4.2 The challenges faced by the students in using Bamboozles as a game-based application in Interactive Speaking

The researchers then looked into the response to the use of Bamboozle application and activities, as well as their usefulness. They conducted interviews with certain students in order to get their opinions, perspectives, remarks, power, weakness or the challenges and suggestions about the use of Bamboozle. Twenty students were questioned from various classes. Each student was asked seven questions in order to obtain qualitative data. Semi-interviewees were held in

Indonesian to ensure that students gave correct answers and to avoid miscommunication. The researcher used digital recording of the dialogues during the interview for continuity and future reference.

According to the findings, the majority of students have a good opinion toward the concept of Bamboozle as a game-based application. The motivating, engrossing, and enjoyable character of the gamification process was stressed by certain participants.

To emphasize the importance of having fun, one of the attendees stated:

"...I believe gamification should be employed since it clarifies the classroom and makes it more enjoyable for students..."

Other students highlighted for motivating nature, and two students stated:

"....at first, I assumed it was going to be like the other classes we had, but once I discovered it was gamification like this, I became even more driven..."

Despite the fact that there is agreement on several areas, the study raises other questions, such as whether gamification is an age- and content-bounded notion. The basis for labelling certain topics as contentious is that the number of people who hold opposing viewpoints is rather close. When it came to the age-bounded question, somewhat more people agreed that gamification is an age-bounded process. When it came to the content-bounded issue, somewhat more people said gamification is not a content-bounded process. Two of the participants offered their thoughts on the following topics:

"...I believe that all courses could be made into games..."

"...it's important to pay attention to the students' age groups. It would be better, in my opinion, if it addressed a younger age range..."

Other problems encountered by the students are regarding the internet connection and students' anxiety.

"...I have a really bad internet connection so I cannot follow all the stages…"

Finally, the study follows all the stages…"

Finally, the study found that a gamified online course should feature a relevant storyline, competitive challenges and leaderboards, plaques as feedback on students' progress, continual incentives, and a win state. Students' engagement is also the main focus in this Bamboozle. The majority of participants express their gratitude for the additional delight they provide to the surroundings. A participant's

statement on the win-state can be given to show one of the issues raised by the participants.

"Being in a position to win made me incredibly delighted."

Overall, the findings indicate a positive impact on the students' engagement in learning Interactive speaking. In assessing students' engagement based on percentage score, the results show that students are enthusiastic about learning Interactive speaking through the use of Bamboozle as a game-based application.

Discussion

This study investigated the use of Bamboozle as digital game-based application in the EFL classroom especially Interactive Speaking class. Finding support the studies of All, Castellar, & Van Looy, (2021); Acquah, & Katz, (2020) investigated the use of the digital game Bamboozle in EFL classrooms. The game, which incorporates elements of trivia and question-based challenges, was found to be effective in enhancing students' language skills, particularly in vocabulary acquisition and retention. The researchers noted that the competitive nature of the game motivated students to actively engage with the language content and provided opportunities for meaningful language practice in a fun and interactive setting.

Additionally, Li and Lan (2022), a qualitative analysis of student feedback revealed that participants found Bamboozle to be an enjoyable and valuable tool for language learning. Many students expressed enthusiasm for the game-based approach, noting that it not only improved their vocabulary knowledge but also fostered a sense of camaraderie and teamwork in the classroom.

This study highlights that it is worthwhile to attempt the modification for bridging and familiarizing students with digital game-based learning, which is called Bamboozle to learning English speaking.

This students' responses and opinions show that the online learning tools designed were well received by the students. This is due to the fact that the kids found it to be highly intriguing. The activities for integrating language learning skills. The results of the semi-structured interviews revealed that the students were satisfied and enjoyed studying academic writing using Bamboozle as a game-based application. The majority of students stated that using Bamboozle involved all

students in the classroom. It trains the students to be more enthusiastic in competing and be sportive. Gamification is effective at boosting participation and engagement in language sessions, according to Cahyani (2016). In addition, studies by Lam et al., (2018) and El Tantawi et al., (2018) found that gamification improved students' academic writing performances, which is consistent with our findings.

Additionally, the findings of our study corroborate those of Ghobadi et al. (2021), who investigated how a game-based application could improve exceptional students' acquisition of vocabulary in English and concluded that all exceptional learners improved their vocabulary skills following training with the game-based application. Furthermore, the results of this study concur with those of Shirazi et al, (2018) who examined how using video games affected EFL students' ability to learn speech acts. Their research's conclusions demonstrated that teaching EFL students through video games improve their ability to learn speech acts. Furthermore, (Schunn et al., 2019; Liao et.al, 2024) support our findings, claiming that Canadian ESL students' oral fluency and willingness to communicate were enhanced by playing the Space team ESL game. The researchers reveal that inserting Bamboozle can involve the students' dominantly, they participated actively in a competition atmosphere so it boosts their interest in learning Interactive speaking. They believed that learning by using Bamboozle as a game-based application was extremely beneficial and might help them improve their academic performance. It can help them feel more comfortable with spoken and written communication. The diverse teaching materials and the teacher's learning strategies employed in their teaching and learning process, according to Aeni et al. (2023); Chen, (2023), might minimize the anxiety or oral communication dread of the students. Furthermore, the topics of the Bamboozle or the choices of clues is crucial as well. They can pique students' enthusiasm in learning and help them overcome obstacles.

Moreover, because students immerse themselves in the learning process and take an active role in it, utilizing a game-based learning approach with Bamboozle can enhance the learning experience and make it more enjoyable and participatory. There are benefits to learning using game-based learning approaches, such as: The following are some benefits of game-based learning: (1) It is engaging, enjoyable, and fosters teamwork and innovative thinking; (2) It eases the learning process by reducing stress; and (3) It has a unique learning style and receives

positive feedback. enjoyable and practical, (4) Capable of gauging comprehension, strengthening memory, relieving stress following education, and igniting interest in learning becomes more fun and interactive because students immerse themselves in it and participate more actively in learning activities. (Hung et al., 2019, Abidin, 2023).

Moreover, this study's findings are consistent with those of Ahmed et al., (2022) who verified the usefulness of game-based learning (Kahoot) for vocabulary acquisition in English. Furthermore, Shirmardi et al. (2022), who examined the impact of a mobile game-based application (Spaceteam ESL) on students' pronunciation, corroborate the findings of our research. The study's findings demonstrated that, on the pronunciation post-test, the experimental participants outperformed the control group. This research is consistent with digital games affecting the growth of interpersonal relationships among EFL students. According to the findings, the study's participants interacted more when they played games. It is in line with the scholars Almusharraf, (2023); Yu, & Tsuei, (2023); Xu, et.al (2020), they revealed that students tend to be more cooperative when they were involving in a game competition in EFL classroom.

The result of this study showed that employing digital game-based to boost the students' enthusiasm in learning. They experienced more peer relationships, teamwork and joyful environment created by using bamboozle as part of gamification. According to (Mahayanti, et al, 2020), the enjoyable elements of educational games might help students' feel comfortable which is beneficial for improving their English language acquisition.

This research supported the theory about games in EFL learning composed by Aldrich, (2020), through the integration of topic content with gameplay, digital game-based learning allows students to apply their knowledge in real-world circumstances, increasing the fun and engagement of the learning process. Students are given difficulties and barriers through game-based activities, which encourages them to work harder. When they overcome these obstacles, they feel more accomplished and confident in themselves. They more engaged in the teaching and learning process.

Lastly, according to Saud et al (2023, September) it's critical to note that gamification has ethical boundaries and runs the risk of causing circumstances in which the context of an experience is altered to the point of concealing the

genuine nature of a task, thereby invalidating participants' permission. Students may have technical challenges, such as device compatibility concerns, connectivity problems, or software bugs. These problems can impede learning and make it more difficult to use Bamboozle effectively for Interactive speaking. As game-based apps frequently have a learning curve, children might find it difficult to get used to Bamboozle's new structure, controls, or features. Their concentration on Interactive speaking assignments may be impacted by this initial time of transition. Therefore, the teacher should consider all the compatible things in creating an enjoyable environment in learning by using digital game-based.

Subsequent investigations may examine the enduring impacts of digital web-based learning to promote the students' engagement (involvement and interest). Further research endeavors the applicability of digital game-based learning in different context and approach. This study did not investigate more detail in experimental study to see the learning achievement after being taught by integrating digital game-based learning (other games), thus, future research may use the other research designs to investigate the students' learning achievement.

As the practical contribution of this study, by offering a more engaging and entertaining learning environment, game-based learning has the potential to increase student engagement. Games frequently have components of growth, success, and competition, which can inspire students to take an active role in their education.

In conclusion, by highlighting the effectiveness of practices Bamboozle as digital game-based learning in promoting the students' engagement and involvement in learning interactive speaking. That games enable students to become enthusiastic and enjoy the lesson. Further investigation in this field has the potential to enhance academic results and cater to the varied requirements of students.

Conclusion and Suggestion

This mixed method study's objective was to provide Bamboozle as a game-based application in language learning especially designed to boost motivation and engagement in online classrooms. The participants were posted in three categories, namely: the highly engaged, the moderate engaged, the lowly engagement. The higher they engage the better performance that they have in

learning English, especially Interactive speaking. It may be possible to improve learning results by integrating digital games into the classroom. Enhancements in critical thinking, problem-solving techniques, and subject expertise could be part of this. Further researchers need to conduct the research regarding this context in other settings and can be formulated as community.

Designing gamified experiences with transparency and clarity in mind is essential to reducing this risk. Participants should be fully aware of the system's objectives, constraints, and possible results. It is crucial to give participants complete information about how their data will be utilized, if relevant, and to give them the choice of participating in the gamification process or not. It's also crucial to consider any possible unintended implications of gamification. This can compromise participants' long-term commitment and lessen their potential sincere interest in and enjoyment from the work. When introducing gamification, ethical issues should be prioritized, and the system's effects on participants should be regularly assessed. Designers and implementers can create gamified experiences that increase engagement while preserving participants' autonomy and informed consent by keeping these ethical constraints in mind.

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