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An Integration of Game-based Learning in a Classroom: An Overview (2016 - 2021)

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Abstract

Games are increasingly becoming common in learning environments, and to match the requirements of developing a course as a game, a variety of technologies have been developed. Besides education, game-based learning has been popular in other settings, including professional training and social media. By introducing gaming elements as a training method, game-based learning platforms will boost students' engagement, motivation, and productivity. Game-based learning is more than just making games for students to play on the surface; it is also about establishing learning activities that gradually teach subjects and lead users to achieve goals. This paper reviews the two research elements: the instruments used and disciplines done by 21 researchers on the game-based learning approach. The findings show that most studies have remarkable results in developing the game-based learning method. Generally, game-based learning in education strikes the perfect balance between subject matter and gameplay and the students' capacity to retain and apply that knowledge in real life. Nevertheless, more research in game-based learning qualities and elements is required to provide extensive knowledge on the adaptability of current technological systems.

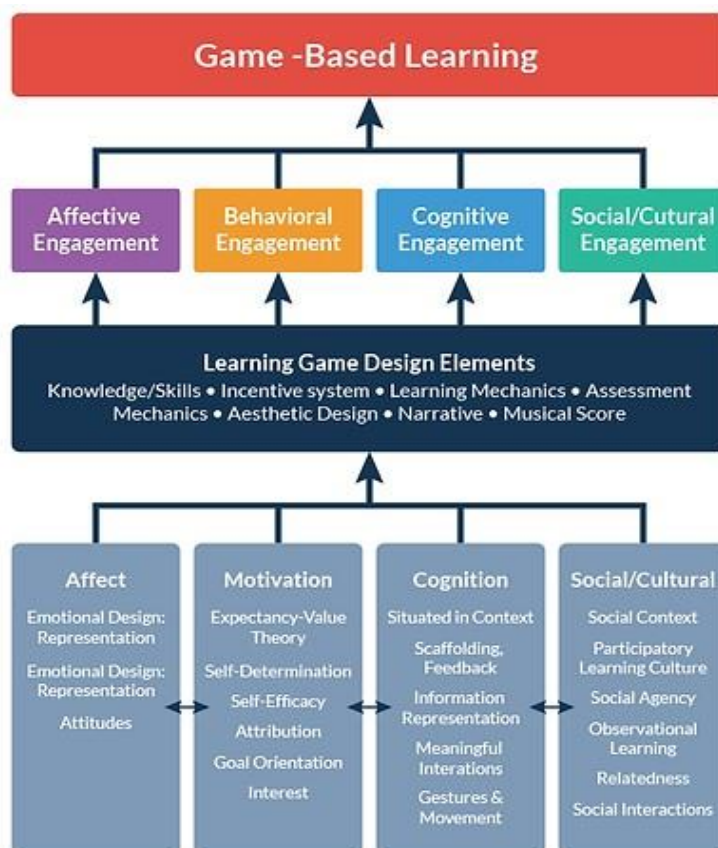
Keywords: Game-Based Learning, Educational Technology, Technology-Enhanced Language Learning, Content Analysis, Information Technology

Introduction

To produce more bilingual people in Malaysia, students need to learn the teachers' English language. Since the beginning, many efforts had been made to achieve the purpose, such as the Razak report 1956, which states that English and Malay are compulsory subjects to all

schools. In addition, the importance of English education towards the students can be seen expressed by Putra (2020) as he highlighted the necessity to learn English to help students have unlimited access to modern science, entertainment, information, and communication. As a result, students who can master English are more likely to have the skills to communicate with people around the world. Therefore, the government declared English as the second language after Malay as the national language; this led to the importance of having English teachers attract students to learn the language (Archana & Kumbakonam, 2016). However, many challenges are faced by the current teachers to achieve this due to the students' environment and the level of competency among teachers in effectively imparting knowledge and skills to students (Goliong et al., 2018). According to Saad et al., (2016), these issues are because technology has taken over worldwide, which makes most people, including educators, need to accommodate the current ways of teaching to satisfy the students' interest in learning. Hence, one of the ways to achieve that is that teachers need to integrate game-based learning (GBL) in their lessons (Felszeghy, 2019). This method can be used as a game-based approach in English teaching. It is one of the required instructional methods to stimulate students' learning interests and improve teaching effectiveness (Zhang, 2018). Hence, this study aims to identify the level of participants, examine the methodological approaches used by researchers, and observe the disciplines covered in the selected articles on game-based learning from 2016 to 2021. This article will also explore the basic foundation and characteristics of game-based learning, the overview of game-based learning from previous research, the implementation of game-based education to the students and teachers, and the conclusion and recommendations for future research.

Theoretical Framework



Correspondingly, the theoretical framework of game-based learning consists of affective engagement, behavioural engagement, cognitive engagement, and social or cultural engagement. Affective engagement focuses on the learners' emotions and beliefs. This is critical as it serves as a basis for the learners' learning experience and feeds into the game's design's behavioural, cognitive, and social or cultural components. Behavioural engagement focuses on how motivated and engaged learners are with the material. Games have long been assumed to attract individuals and keep them more engaged for extended periods due to incentives such as gold stars, trophies, scores, or awards. Cognitive engagement focuses on how students to reason, recall, and think. In other words, it focuses on how data is processed. Play encourages students to develop symbolic thinking by exposing them to varied representations of reality. For example, a child can believe that a box is a race vehicle despite understanding that it is not one. Students are encouraged to discover deeper meaning by interacting inside the game's setting in game-based learning. Finally, social or cultural engagement focuses on interaction with peers. Education is emphasized through group participation and collective knowledge to achieve a goal. The learners' self-image and perception of others are influenced by integrating cultural and social factors.

Game-Based Learning

Game-based learning is undeniably an engaging pedagogical appeal in ESL classrooms. It is deliberately created for learning purposes and features supplemental intellectual benefits. Friedrich Fröbel's ideas of learning through play gave rise to kindergarten in the mid-1800s (Wasmuth, 2018). Game-based learning environments' propensity to provide effective and engaging learning experiences is one of its most distinguishing features (Andrew et al., 2020). Instruction is blended with authentic game experiences in games-based learning. There has been significant growth in both scientific and public interest in using games of severe goals (Boyle et al., 2016; Sørensen et al., 2016). Students nowadays are particularly interested in computers.

Conversely, instructors will devote most class time to more effective teaching. Many educators have recently explored Game-Based Learning as an educational method to boost school students' academic accomplishment motivation. Gamification also helps teachers and students prepare for the challenges of globalisation in the classroom. Online interactive games are relevant and essential for improving language instruction quality and promoting digital literacy among the younger generation. This is following the goals of the United Nations of the fourth industrial revolution's requirements (Yunus, 2021). In 2003, Nick Pelling came up with "gamification" (Yang, 2014; Leaning, 2015). Gamification for education arose from that endeavour and has now developed into an area of research. Joey Lee, the Director of the Games Research Lab at Teachers College, Columbia University, and the Director of Game Research and Development at the Institute for the Future have made significant advances in gamification or gamified thinking in educational environments.

Numerous examples of gamification in offline and online learning contexts demonstrate how game-based learning is undoubtedly an appealing pedagogical appeal in ESL classrooms. One of them is a public school in New York City that began offering its first class of sixth graders a gamified curriculum in 2009, in which learning is incentivized through games. For example, "The Way Things Work," the school's integrated maths and science program, allows pupils to understand how things work. The Khan Academy, an online gamified learning platform with

instructional videos and exercises on various topics, is another gamification in learning. Khan Academy launched badges to motivate students to learn in 2010. There are hundreds of badges divided into several categories, such as moon badges for significant learning investment and sun badges for dedication (Leaning, 2015). These examples show how undeniable game-based learning can help language learners enhance their motivation and communication abilities while learning a language. According to the findings, most research has unified substantial outcomes; encourages students to participate in class by motivating them and providing a competitive environment (Huseyin, 2018).

Current Stage and Concern

The Fourth Industrial Revolution has begun with a paradigm shift in the industrial revolution (IR 4.0). The development of new technologies has resulted in many innovations and advances in the economy, society, and people lives (Hussin, 2018). The introduction of the term Education 4.0 is one of the most visible adjustments from the rise of IR 4.0. Educators have viewed the implementation of game-based learning to improve the effectiveness of classroom learning. Since the global COVID-19 breakout in 2020, the need for better education for students has become even more pressing (Kaharuddin, 2020). More action is needed to meet the demand for new teaching and learning mechanisms in a unique ecosystem during a pandemic. Closures of educational institutions due to COVID-19 outbreaks have had an unprecedented influence on education; teaching is moving online on an unproven and unusual scale, and student assessments are likewise migrating online – all with a lot of trial and error and uncertainty for everyone. COVID-19 has significantly impacted the entire world, including the education industry, with 90 percent of schools closing (Toquero et al., 2020). The adaptability of online learning has increased, and information sharing via online platforms is becoming increasingly viable. Kaharuddin (2020) mentioned that both instructors and students began to acclimate to the new educational paradigm throughout the epidemic. As a result of the current circumstances, the term "game-based learning education" is gradually gaining traction and becoming one of the most intriguing fields to explore.

Researchers have previously stated that more research on games in teaching and learning processes is required (Da Rocha Seixas et al., 2016). The use of games in classroom instruction should also be highlighted. However, Akdogan (2017) proposes that incorporating games into the learning process might motivate students. Still, the lack of materials in classes and teachers' lack of game expertise make employing games in primary schools challenging. The ability to retain motivation and concentration in online distance learning is a significant difficulty among learners in online classroom learning. As a result, the instructors' primary responsibility is to guarantee that the students remain focused during the session (Zakaria et al., 2021). Thus, teachers play a significant role in utilising game-based learning in classrooms during online distance learning. This concept implies that emergency e-learning teaching should be more engaging and innovative to encourage students to learn from a distance. As a result, the move to e-learning provides teachers with an opportunity to attract the interest of digital students through game-based learning (Toquero et al., 2021).

Brief Explanation of the Study

Table 1- Research on game-based learning from 2016-2021

No	Author/year	Title
1	Sprague (2016)	Improving the ESL Graduate Writing Classroom Using Socratic: (Re)Considering Exit Tickets
2	Tsai et al (2016)	Can learning motivation predict learning achievement? A case study of a mobile game-based English learning approach
3	Akdogan (2017)	Developing Vocabulary In-Game Activities And Game Materials
4	Talib et al (2017)	The Effects of Digital Game-based Learning on Primary School Students' English Vocabulary Achievement and Acceptance
5	Öztürk (2018)	Learning on Young Learner's Vocabulary Growth and Retention Levels: An Experimental Investigation
6	Bicen (2018)	Perceptions of Students for Gamification Approach: Kahoot as a Case Study
7	Muhridza et al (2018)	Using Game-based Technology, KAHOOT! for Classroom Engagement
8	Arif et al (2019)	Benefits and Challenges of Using Gamebased Formative Assessment Among Undergraduate Students
9	Keodara (2019)	The Implementation of Game-based Learning to Improve in English in Cambodia
10	Ninausa et al (2019)	Increased emotional engagement in gamebased learning – A machine-learning approach on facial emotion detection
11	Taib et al (2019)	Students' Opinion on a Language Game: A Preliminary Study on MonoEnglish
12	Partovi et al (2019)	The effect of game-based learning on academic achievement motivation of elementary school students.
13	Lu & Lien (2019)	Conscientiousness in Game-Based Learning
14	Huck et al(2020)	The Role of Epistemic Curiosity in GameBased Learning: Distinguishing Skill Acquisition From Adaptation

15	Yi et al (2020)	Conscientiousness in Game-Based Learning
16	Samortin (2020)	Effects of Gamified Learning Activities in Enhancing Junior High School Students' English Vocabulary Retention
17	Idris et al(2020)	Game-Based Learning Platform and its Effects on Present Tense Mastery: Evidence from an ESL Classroom
18	Qin & Hua (2020)	In-Game Instructions: The Extent of Their Usefulness in Enhancing the Vocabulary Acquisition of ESL Learners
19	Shaikh et al (2020)	Using the Concept of Game-Based Learning in Education
20	Crystal Callista Anak Yunus/Tan Kim Hua (2021)	Exploring a Gamified Learning Tool in the ESL Classroom: The Case of Quizizz
21	Zakaria et al (2021)	Pre-Service Teachers' Views on the Implementation of Game-Based for Academic Writing

Table 1 shows a few recent studies in Malaysia from 2016 until 2021. A case study of game-based learning by Huseyin (2018) found that game-based learning is beneficial to student motivation. The study was conducted in Istanbul Aydın University, Istanbul, Turkey. The research on game-based learning was then continued by Yunus et al (2021), highlighting Quizizz as a tool to improve teaching and learning of English irregular past verbs among young ESL students and instil enthusiasm and a sense of passion. In the same topic, Partovi (2019) had focused research on academic accomplishment motivation using game-based learning. Later, Akdogan (2017) had researched developing vocabulary in-game activities and game materials. Besides that, in the study of game based-learning, Liu et al. (2020) had found that educational institutions need to utilise game-based learning to favour significant personality traits like conscientiousness in students. In addition, research made by Shaikh et al. (2020) proved the impact of game-based learning in enhancing the motivation and attraction of school students to learn. This research was then supported by Tsai et al (2016) as they had used the Happy English Learning System, a mobile game to teach English which increased motivation for the Taiwanese students to learn English and engage in the class.

In exploring game-based learning, research was done by Huck et al (2020) focused on the role of epistemic curiosity as a tendency to seek information and fill gaps in knowledge. Furthermore, several studies have found that game-based learning can increase various skills. According to Zakaria et al (2021), the use of game based-learning enhanced the writing skills among the students. Taib et al (2019) revealed that game-based learning is useful for ESL learning as it improves students' language skills while increasing their confidence level. In a research study; In-Game Instructions: The Extent of Their Usefulness in Enhancing the Vocabulary Acquisition of ESL Learners by Tan and Tan (2020), the findings demonstrated that video games could aid vocabulary acquisition in a variety of ways and have a considerable

impact on players' English language skills. Idris et al (2020) conducted a study on game-based learning towards the Present Tense Mastery in which it was proven that it has a positive result and acts as a booster to its mastery. Later, Samortin (2020) conducted the effectiveness of gamified learning exercises in improving English vocabulary for the same purpose. Furthermore, Ozturk (2018) and Rabu and Talib (2017) supported another research on the effectiveness of game-based-learning towards the students' English vocabulary.

In inspecting the engaging pedagogical appeal in ESL classrooms, a research study of increased emotional engagement in game-based learning by Ninaus et al (2019) also discussed the correlative statement. Adult participants who completed either a game-based task or a nongame-based equivalent were evaluated for emotional engagement using automatic facial emotion detection and subjective assessments. The study was able to identify whether individual participants were engaged in the game-based or non-game-based task using a machine learning strategy on facial emotion recognition data with classification accuracy well above chance. Muhridza et al (2018), in their research paper; Using Game-based Technology, KAHOOT! for Classroom Engagement, stated that game-based technologies are common in the English as a Second Language (ESL) classroom. Students' engagement in the classroom where the technologies are concerned should be paid attention to. The findings of this study suggest that KAHOOT! is useful in fostering students' engagement and enhancing their language skills. The participants in this study consisted of 29 university students from Universiti Teknologi Malaysia (UTM).

Methodology

Meta-analysis is one of the strategies chosen by the researchers in seeing the advantages of learning approaches (Jones, 2016; Rahman, Aris, Rosli, Mohamed, Abdullah, & Zaid, 2015). Through meta-analysis, researchers can gauge critically and connect the results of similar studies (Fagard, 1996). The meta-analytic approach used here has enabled the researchers to maximize their observation in exploring the benefits of game-based learning in different groups. Many instruments can be used to aid the researchers in carrying out their studies. One may use more than one way to their studies depending on the objective of the study and the selected respondents. Nevertheless, the approach selected must be apposite for the proposed objective.

The data shown in the meta-analysis table indicates patterns over time based on the study's timeline between 2016-2021. Most of the studies have been conducted on students and teachers in the timeline stated. The data analysed three different effectiveness of implementing game-based learning: motivating, improving English skills, and engaging learners in the ESL classroom. Moreover, the research objectives and questions of this study are as follows:

Research Objectives

1. To explore the instruments used by researchers in the selected articles on game-based learning from 2016 to 2021.
2. To investigate the disciplines covered in the selected articles on game-based learning from 2016 to 2021

Research Questions

1. What instruments do researchers use in the selected articles on game-based learning from 2016 to 2021?
2. What are the disciplines covered in the selected articles on game-based learning from 2016 to 2021?

Findings and Discussions

Instrument

Table-2. Instruments covered in the selected articles

No Instruments	No. of articles	References
1 Survey	5	Partovi and Razavi (2019); Taib et al (2019); Shaikh (2020); Yi (2020); Zakaria et al (2021)
2 Questionnaire	3	Akdogan (2017); Yunus et al (2021); Ninausa et al (2019)
3 Interview	1	Tan and Tan (2020)
4 Survey & Questionnaire	1	Lu et al (2019)
5 Survey & Experiment	3	Huck et al (2020); Tsai et al (2016); Talib et al (2017)
6 Quantitative & Qualitative	5	Sprague (2016); Bicen (2018); Keodara (2019); Arif et al (2019); Muhridza et al (2018);
7 Test	3	Öztürk (2018); Idris et al (2020); Samortin (2020)

A total of 21 studies were found; most of the studies had used surveys, interviews, and experiments. The researchers selected the instruments based on how well they suited the topic of the studies and targeted participants. In qualitative research, an interview is a dialogue in which information is gathered. The interviewer manages the interaction and asks questions, while the interviewee responds to the questions (Easwaramoorthy & Zarinpoush, 2006). According to Glasow (2005), survey research is used to describe certain elements of a population quantitatively and involves examining the relationships between variables is a common aspect. Meanwhile, experiments can be understood as a study that strictly focuses on a scientific research design that includes a hypothesis, a manipulated variable, and measurable variables (Harland, 2011). Bicen (2018) utilised interviews as the qualitative method to discover the perceptions of the use of the KAHOOT! platform. Akdogan (2017) employed interviews with 50 students and teachers from Turkey and Bangladesh studies. Meanwhile, Sprague (2016) used an anonymous survey once per week after Socrative had been used eight times. Tan and Tan (2020) stated that the method used in this study includes interviews as the research design to study in-game construction in enhancing the Vocabulary Acquisition of ESL Learners. In a study by Arif et al (2019), students were interviewed to consider the benefits and challenges of integrating KAHOOT! with other learning techniques such as Aptitude, Creativity, and Emotional Intelligence (ABI).

Zakaria et al (2021) had surveyed to explore their perception of the implementation of games in a writing classroom. After 14 weeks of using game-based learning, 32 preservice teachers' views on the implementation of game-based learning were surveyed. Furthermore, Taib et al (2019) distributed a survey to the participants after ESL lessons to study their views on the effectiveness of a language game named MonoEnglish, which four students created under the supervision of a lecturer. Akdogan (2017) also utilised questionnaires in the research studies on 50 participants. Meanwhile, Liu et al (2020) has surveyed a game played by 60 university bachelors. The data were collected through surveys on personality (conscientiousness), mediating features (motivation and player involvement), learning efficacy (cognitive and non-cognitive learning), and GBL acceptance before the game. Moreover, research made by Shaikh et al (2020) had focused on studying the use of the Concept of Game-Based Learning in Education in which they had used a survey as they had gathered and observed 82 students of the same age of the group.

A case study of a mobile game-based English learning approach by Tsai et al. (2016) had used a quasi-experimental pre-test and post-test design for 38 Taiwanese students for eight weeks. In the research of the effects of digital game-based learning on primary school students' English vocabulary achievement and acceptance by Talib and Rabu (2017), they also used a quasi-experimental design that involves two groups containing 70 years four students. Idris et al (2020) used a pre-experimental approach (one-group pre-test and post-test design) in their study. The data was gathered quantitatively through a comparison of pre-and post-test data. The participants in this study were 31 Year 3 students, with no control group. Meanwhile, a case study by Samortin (2020) was conducted in quantitative research. There were 133 respondents from the junior high participants. This experimental research (pre-test and post-test) indicated the impact of the independent variable, GLA, on the dependent variable and student vocabulary retention. The study conducted by Huck et al (2020) had conducted a task-change paradigm and a piecewise latent trajectory model.

Hence, surveys are the most dominant methodological approach as it is simple to conduct and easy to distribute to individuals. This explains the reason why it is the most popular methodological approach. Moreover, it can be distributed digitally or in hard copy. The second most used approach is the mixed method within single research where there is a combination of quantitative and qualitative data. This helps decipher discrepancies between quantitative and qualitative findings because it reflects the participants' viewpoints (Wisdom & Creswell, 2013).

Disciplines

Table-3. Disciplines covered in the selected articles

No.	Discipline	No. of articles	Author/year
1	English as A Second Language (ESL)	16	Taib et al (2019); Sprague (2016); Zakaria et al (2021); Öztürk (2018); Muhridza et al (2018); Liu et al (2020); Huck et al (2020); Tsai et al (2016); Arif et al (2019); Keodara (2019); Talib et al (2017); Idris et al (2020); Tan et al (2020); Samortin (2020); Yunus et al (2021)
2	Psychology	2	Shaikh et al (2020); Ninausa et al (2019)
3	Varied	1	Partovi et al (2019)
4	Preschool Teaching	1	Bicen (2018)
5	Computing	1	Yu et al (2019)

Game-based learning significantly affects students' engagement in ESL classrooms as a pedagogical appeal. The engagement is shown through the students' level of motivation. Several researchers discovered that gamification might influence people's motivations and actions (Akdogan, 2016; Tsai et al., 2017; Bicen, 2018; Keodara, 2019; Shaikh, 2020). Research exploring a Gamified Learning Tool in the ESL Classroom (Idris et al., 2020; Yunus et al., 2021) discovered Quizizz positively impacted the respondents' learning of irregular past verbs when it was implemented. Compared to traditional approaches, integrating computers and the internet in language instruction promotes more effective learning, builds positive attitudes in pupils, and improves retention.

Furthermore, it is reported that game-based learning enabled students to communicate with their instructor in ways they would not have done otherwise and that it increased their classrooms' comfort level (Sprague, 2016). The research (Muhridza et al., 2018; Partovi, 2019) found that game-based learning positively affects the acquisition and adaptation of complex skills. Game-based learning environments have the potential for facilitating learning that generalises beyond instructional settings. Hence, optimizing the engagement of students in the classroom. Game-based learning also enabled students to learn collaboratively with their peers, which led to their engagement in the classroom (Zakaria et al., 2021). The interaction occurred actively before and after the lesson.

Learner-centered pedagogy is promoted through game-based learning since it encourages students to be active participants (Taib et al., 2019). The researchers found that students who acted as active recipients of knowledge were more likely to learn and enjoy the learning process. This indicates game-based learning may hold students' attention and keep them engaged. The finding also demonstrated that video games could aid vocabulary acquisition in various ways and considerably impact players' English language skills (Rabu & Talib, 2017; Tan & Tan, 2020; Samortin, 2020). A study by Huck et al (2020) found that game-based learning has a beneficial impact on learning and adapting a difficult skill; epistemic curiosity and learning.

Moreover, they stated that game-based learning environments could promote transferable teaching beyond the classroom. In light of a broader discussion, the notion that perfectionism

mediates GBL in various ways is intriguing. Perfectionism is sometimes regarded as a significant feature of Asian culture, particularly Chinese culture, and is indirectly linked to the engaging pedagogical appeal in ESL classrooms (Liu et al., 2020).

Thus, game-based learning has a significant effect on students' learning in various disciplines such as English As a Second Language (ESL), Psychology, Varied, Preschool Teaching, and Computing.

Conclusion and Recommendations

In conclusion, game-based learning occurs when game features and principles are implemented within learning activities in the educational process. This paper proved that game-based learning applies to any level in the educational field. In accordance with the selected papers above, game-based learning has proven to contribute several positive effects in education and provide advantages for the contributors. For instance, it significantly impacts the students' learning engagement. Hence, this selected approach is proven to boost engagement between the instructors and learners, influencing the learners' motivation and actions, improving the learners' productivity, building positive attitudes, improving retention, and stimulating the students to collaborate with their peers.

Consequently, it has been seen that game-based learning has succeeded in becoming one of the very flexible teaching approaches and has a very wide diversity in education. For instance, in English As a Second Language (ESL), Psychology, Varied, Preschool Teaching, and Computing. Thus, applying game-based learning in the learning process does not only affect the learners but can also help the instructors or educators improve the quality of their teaching skills and aids, and instantaneously can positively benefit the education system to ensure the production of a better generation in the future. Lastly, this paper believes that game-based learning succeeds in impacting the learning process.

Based on the studies above, game-based learning has been exhibited as an engagement appeal in the educational field. As most of the studies highlighted the relationship between motivation and engagement of students, game based-learning is one of the methods that have been implemented in education to satisfy the needs of the current generations. Nevertheless, experts claim that overuse of game-based learning should be avoided because it can reduce the fundamental drive for learning. They have been condemned and raised in conversational issues among educational experts. It is due to some teachers may criticise gamification for not taking education seriously enough (Pink, 2009). Therefore, more studies about the negative perceptions among teachers should be done to guarantee adequate engagement, as teachers should have a good awareness of the intended audience's interest.

Theoretically, it can be seen that ESL is the most common discipline that uses game-based learning as the main approach of teaching and learning compared to the other disciplines. It is believed that teaching language, especially English, could be fun and adaptable to many approaches. In terms of methodology, this study could help other researchers study the pattern of game-based learning as one of the teaching approaches. This study could also help enrich the literature of game-based learning worldwide.

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