

**Gamifying Reading for Learners' Comprehension Enhancement:
A Scoping Review**

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Abstract

It is a challenge to create a fun and engaging educational setting, especially when reading is involved. During language teaching, educators opt for the conventional methods but it does not seem to impress the current generation who are more interested in fun learning activities in their lessons. The involvement of games is the reason learners are engaged in their learning process and eager to experience more of such lessons. Thus, a scoping review was conducted on gamification, which uses game elements in a non-gaming context. It is done based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) to identify the latest acknowledgment of resources on gamification in improving reading comprehension. A total of 95 citations through 5 databases were derived in this scoping review. A total of 12 records were perceived as eligible for selection. Results show that gamification does influence learners positively when it is incorporated with the aim to enhance reading comprehension.

Keywords: Game element, gamified learning, reading comprehension, ESL, EFL

1. Introduction

The current advancement in technology depicts the fast pace of this era. We are introduced to many tools that help lift a burden off our shoulders and make our lives easier. This is also present in the education field where learners have been constantly exposed to various teaching methods and techniques. One of the skills that require recognition for its importance is reading skill. It is perceived to be a crucial mastery because reading helps coordinate other skills such as writing. Unfortunately, a large number of second language learners face trouble reading regardless of spending years of formal education in English (Sidhu et. al., 2018). The application of ineffective tools may also contribute to students' poor reading comprehension because they seem to lack interest in cultivating their reading habits.

Due to the fact that reading is enhanced through repeated practice, it should be done regularly, which causes a loss of interest among the students (Chua & Sulaiman, 2021). The process of acquiring knowledge should be able to attract the attention of students and provide a fun conducive setting to avoid the perception of learning as a routine or chore (Alwadai, 2019). They need to be motivated to take control of their own learning, thus playing an active role in the process with the aid and guidance from their educators as encouraged by Alshumaimeri (as cited by Sholeh et al., 2019) to employ a variety of teaching strategies to disclose the language to their learners. This is deemed possible with the change in teaching methods where the educators cater to their students' interest to learn in a fun manner by employing creative teaching techniques such as gamification.

According to Rivera and Garden (2021) gamification is unlike game-based learning as it requires the application of elements present in a game into a non-game context – education, without altering the whole course into a game. It strives to make the process of learning more engaging for the students to be motivated enough to take the initiative to participate in it, supporting the fact that motivation serves as a key factor for their success. The presence of game elements in education also imitates the game-like impression with the potential to urge them to perform better in a competitive environment alongside their peers.

The application of gamification may also be a familiar circumstance for students as they are exposed to games and gadgets, which are perceived to be their favorite pass time in the current era. Hence, educators are encouraged to take the opportunity and make use of their interests to provide a fun learning setting based on their preferences to ensure they engage in the lesson willingly. According to Boyinbode (2018), it is deemed pivotal to take such a step due to the decline in students' English language performance globally. Thus, gamification is seen as a solution to overcome the issue as it possesses the element of fun as well as the potential to develop language skills (Mee et al., 2022).

Therefore, when students engage in their learning process upon their own initiative, they indirectly link better with the lesson, thus comprehending the content better (Rafiq et al., 2019). Besides, the involvement of gamification in the classroom also imitates the similar attachment that students face when they are gaming, which keeps them continuously glued to their lessons as they receive pleasure from the experience (Rao et al., 2022). This positive influence would eventually contribute to the motive of producing a competent future generation who are equipped with the necessary 21st-century skills (Mee et al., 2021).

2. Research Method

As a reference in order to complete this scoping review, a methodological framework by Arksey and O'Malley (Ghani et al., 2022; Ne'matullah et al., 2022) was used as a guide. The framework is composition of 5 stages: 1) determining research questions; (2) determining

relevant studies; (3) choosing studies; (4) data charting; and (5) collation, summarization, and result report.

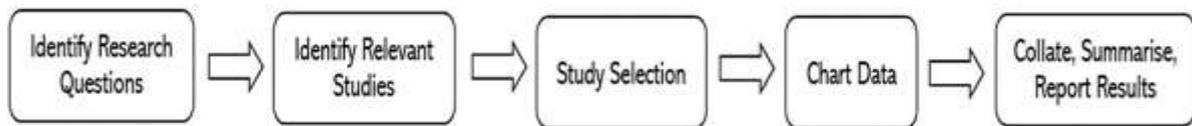


Figure 1. Methodological framework (Arksey & O’Malley, 2005)

2.1 Determining Research Questions

This scoping review discusses the integration of gamification in the education field, focusing on reading comprehension, which is deemed to have limited literature resources. Hence, the PCC (population/concept/context) model was used to disclose the main research question intended in this report – “what can be derived from the current literature resource regarding gamification in improving reading comprehension”.

Table 1 PCC model-based research questions

Research Questions	Specific Objectives
How is research on the application of gamification in improving reading comprehension distributed?	To explore the setting where studies on the application of gamification in improving reading comprehension are developed
What are the research designs used in studies regarding the integration of gamification in improving reading comprehension?	To identify the research designs used in studies regarding the integration of gamification in improving reading comprehension.
What is the purpose of conducting studies on the inclusion of gamification in improving reading comprehension?	To identify the purpose of conducting studies on the inclusion of gamification in improving reading comprehension.
What are the game elements used in gamification to improve reading comprehension?	To identify the game elements used in gamification to improve reading comprehension.
What are the theories used in studies about applying gamification to improve reading comprehension?	To identify the theories used in studies about the application of gamification to improve reading comprehension.
How effective is the integration of gamification in improving reading comprehension?	To summarize the effectiveness of gamification in improving reading comprehension.

2.2 Determining Relevant Studies

In order to identify studies in pertinence to the research of gamification in improving reading comprehension, search strings and keywords were used to aid in browsing through various online databases. It includes Scopus, Semantic Scholar, The Directory of Open Access Journals (DOAJ), Education Resources Information Center (ERIC), and Web of Science (WOS). Boolean operators such as “OR” and “AND” were applied to ameliorate the search string to yield a satisfactory result. Table 2 below shows the search strings and keywords utilized.

Table 2 Search string/Keyword

Database	Search string/Keyword
Scopus	TITLE-ABS-KEY("gamification" OR "gamified" OR "game element*") AND TITLE-ABS-KEY("reading comprehension") AND TITLE-ABS-KEY("children" OR "young learner*" OR "primary education" OR "primary school*" OR "elementary education" OR "elementary school*") AND TITLE-ABS-KEY("English" OR "ESL" OR "EFL") AND PUBYEAR > 2018 AND DOCTYPE(ar) AND SUBJAREA(SOCI)
Semantic Scholar	gamification in reading comprehension
The Directory of Open Access Journals (DOAJ)	gamification in reading comprehension
Education Resources Information Center (ERIC)	(gamification) AND (reading comprehension)
Web of Science (WOS)	(((((TS=(gamification OR gamified OR game element*)) AND TS=(reading comprehension)) AND TS=(children OR young learner* OR primary education OR elementary education)) AND TS=(English OR ESL OR EFL)) AND PY=(2018-2022)) AND DT=(Article)) AND LA=(English)

2.3 Choosing Studies

Gamification is used as a tool of encouragement in many contexts without a boundary. In view of the fact that this scoping review focuses only on an educational setting, a few criteria were set by the research team to determine if the studies retrieved from the search should be included or excluded. 2 team members were responsible for the elimination of duplicate records and the screening of the rest by titles and abstracts to ensure its eligibility for the next stage. As shown in Table 3, the predetermined inclusion and exclusion criteria were listed. The studies that fit the qualification were presented in a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.

Table 3 Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
English language text	Not journal article
Published from 2018 onwards	Not educational context
Application of gamification	Adult learner participants
Focus on reading comprehension	Full text not attained or incomplete

2.4 Data Charting

The content of the chart comprises features of the qualified journal articles that have been addressed and settled upon by the team. The information extracted and charted by the first author includes the title of the study and its authors, the country of origin, the research design applied, the purpose of the study, the gamification elements present, and the theories involved as well as the findings of the study.

2.5 Collation, Summarization, and Result Report

The extracted information was reviewed to reconfirm if it is within the confines of the inclusion and exclusion criteria set previously. It was then transferred into a literature matrix for it to undergo another review by the senior authors. After finalizing the data, the findings of the overall process were reported to facilitate the researchers in the production of the scoping review.

3. Research Results

This scoping review analyzed a sum of 95 citations from 5 databases: n=22 from Scopus, n=19 from Semantic Scholar, n=19 from DOAJ, n=18 from ERIC, and n=17 from WOS. The team managed to identify 11 duplicate articles to be disregarded and was left with the remaining 84 articles which were eligible for the first screening via title and abstract. Out of the 84 articles, 72 were omitted due to their insignificance in the focus of this scoping review.

The remaining 12 articles were potentially relevant; therefore, another screening was done by reviewing the full text to ensure its eligibility. A total of 6 articles were omitted due to the following justification: (a) n=4 was not focused on reading comprehension; (b) n=1 was irrelevant to gamification; (c) n=1 was not an English article. The 6 articles left were acknowledged and agreed upon discussion with the research team to include in the scoping review, as well as an addition of 6 hand-search articles.

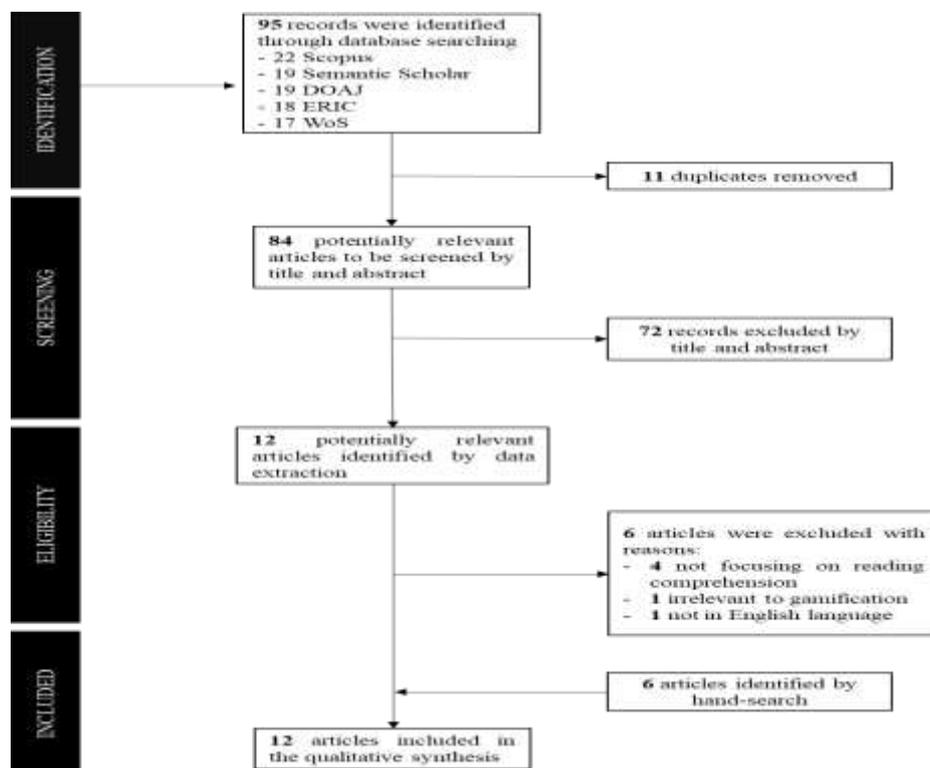


Figure 2. Flow diagram of scoping review

Table 4 Literature Matrix

Title	Country	Research Design	Aim/Purpose	Game Elements	Theory	Findings
Effect of Quizizz Towards the Eleventh-Grade English Students' Reading Comprehension in Mobile Learning Context (Priyanti et al., 2019)	Indonesia	Quasi-experimental design (post-test only control group)	To investigate how gamification in Quizizz affects students' reading comprehension	Not stated	Mobile learning theory and Vygotsky's Zone of Proximal Development (ZPD)	The students had better accomplishments in reading comprehension via gamification in Quizizz compared to those who were taught via traditional teaching methods.
Quizizz Application as Gamification Platform to Bridge Students in Teaching Reading Comprehension (Ratnasari et al., 2019)	Indonesia	Quantitative method with a quasi-experimental design (experimental and control groups)	To examine the impact of gamification in Quizizz on students' narrative text reading comprehension	Not stated	Not stated	Students from the experimental group using Quizizz scored better than the students from the control group.
Adapting Competitiveness and Gamification to a Digital Platform for Foreign Language Learning (Arce & Valdivia, 2020)	Peru	Quantitative method with a quasi-experimental design (experimental and control groups)	To examine the impact of gamification in a virtual setting for foreign language learning	Points, medal (badge), and avatar	Self-determination theory (SDT) and MDA framework	There was development in English reading skills as indicated by the positive result in both mean and standard deviation.
A web-based collaborative reading annotation system with gamification mechanisms to improve reading performance (Chen et al., 2020)	Taiwan	Quasi-experimental design (experimental and control groups, questionnaire, semi-structured interview)	To study the need for gamification to urge students' annotation behaviours and improve their reading comprehension	Levels, leader board, achievement, visual status, clear goals, and immediate feedback	Not stated	The usage of gamification encouraged the experimental group to produce high-quality annotations compared to the control group.

Title	Country	Research Design	Aim/Purpose	Game Elements	Theory	Findings
Exploring the effects of gamification pedagogy on children's reading: A mixed-method study on academic performance, reading-related mentality and behaviors, and sustainability (Li & Chu, 2020)	China	Mixed-method longitudinal design with three interrelated sub-studies (reading examination, semi-structured interview, questionnaire)	To analyse the impact of an online gamified reading platform and its sustainability	Leader board and score	Self-determination theory (SDT) and constructivism learning theory	Students were engaged in the e-learning platform incorporated with gamification, which enhanced their reading motivation and reading abilities.
Students' Perceptions of a Gamified Reading Assessment (Reed et al., 2020)	America	Mixed method (observation, survey, focus group)	To determine the perceptions and interaction of students with reading difficulties toward a gamified reading assessment	Avatar and level	Grounded theory	The students were both motivated and engaged in the gamified reading assessment although the activities were challenging.
The Effect of Gamification on Jordanian EFL Sixth Grade Students' Reading Comprehension (Abusa'alek & Baniabdelrahman, 2020)	Jordan	Quasi-experimental design (experimental and control group)	To investigate the impact on students' reading comprehension via gamification	Levels, points, rewards, and leader board	Not stated	It was inferred that gamification was more efficient in improving students' reading comprehension than conventional instruction.
The Effects of Using Audience Response Systems Incorporating Student-Generated Questions on EFL Students' Reading Comprehension	Taiwan	Quasi-experimental design (experimental and control group)	To determine the effects of gamification in <i>Kahoot!</i> towards young EFL students' reading comprehension	Immediate feedback, points, time, and scoreboard	Social-constructivist theory	Although it was a minor improvement, the experimental group did outperform the control group as derived from the post-test score

Title	Country	Research Design	Aim/Purpose	Game Elements	Theory	Findings
(Mays et al., 2020)						
Battling With Books: The Gamification of an EFL Extensive Reading Class (Freiermuth & Ito, 2021)	Japan	Quantitative (questionnaire)	To motivate students in extensive reading and promote L2 reading enjoyment	Not stated	Not stated	Students were engaged and motivated to play the reading game, especially the weaker ones
Children's Reading Comprehension and Motivation on Screen Versus on Paper (Kaban & Karadeniz, 2021)	Turkey	Quasi-experimental design (treatment and control group)	To investigate the effect of reading with gamification on students' reading comprehension and motivation in an EFL classroom	Time, scores, and levels	Not stated	Gamified reading via screen was concluded to be an effective way to develop reading comprehension skills, reading performance, and motivation
Increasing Students' Reading Comprehension Through Gamification Based on Balinese Local Stories (Nitiasih & Budiarta, 2021)	Indonesia	Quasi-experimental design (one group pre-test post-test)	To study if students' reading comprehension of Balinese local stories improves via gamification	User, challenge, points, levels, badges, and ranking	Not stated	The findings revealed positive progress in students' reading comprehension of Balinese local stories
The Perceptions of Tertiary Level Learners on the Use of Mobile App 'Balloon Vocabulary' in Improving Vocabulary for Reading Comprehension (John et al., 2021)	Malaysia	Mixed-method (questionnaire, semi-structured interview, field notes, pre-test, post-test)	To identify the perception of learners of using a gamified mobile application (Balloon Vocabulary) to improve their vocabulary repertoire for reading comprehension	Scores and immediate feedback	Schemata theory and Connectivism Theory	Gamification advocates an enjoyable learning process and helped the learners improve their reading and vocabulary as they learn collaboratively with their peers

Research Question 1: How is research on the application of gamification in improving reading comprehension distributed?

A sum of n=12 research articles on the application of gamification from 5 databases – Scopus, Semantic Scholar, The Directory of Open Access Journals (DOAJ), Education Resources Information Center (ERIC), and Web of Science (WOS) as well as hand-search was included in this scoping review. As for its distribution, all the studies were conducted in countries such as n=3 (Priyanti et al., 2019; Ratnasari et al., 2019; Nitiasih & Budiarta, 2021) from Indonesia, n=2 (Chen et al., 2020; Mays et al., 2020) from Taiwan, and n=1 each from Turkey (Kaban & Karadeniz, 2021), Jordan (Abusa'aleek & Baniabdelrahman, 2020), Peru (Arce & Valdivia, 2020), China (Li & Chu, 2020), America (Reed et al., 2020), Japan (Freiermuth & Ito, 2021) and Malaysia (John et al., 2021).

Research Question 2: What are the research designs used in studies regarding the integration of gamification in improving reading comprehension?

All 12 articles related to the inclusion of gamification in reading comprehension applied different research designs to conduct the studies. A majority of n=6 applied a quasi-experimental design with n=1 (Priyanti et al., 2019) experimenting with a post-test only control group, n=1 (Chen et al., 2020) had both experimental and control group along with a questionnaire and interview, n=3 (Abusa'aleek & Baniabdelrahman, 2020; Mays et al., 2020; Kaban & Karadeniz, 2021) with an experimental and control group, and n=1 (Nitiasih & Budiarta, 2021) had a single group pre and post-test. Another n=3 applied a mixed-method design where n=1 had observations, a survey, and a focus group interview (Reed et al., 2020), n=1 has a longitudinal design with three interrelated sub-studies with a reading examination, semi-structured interview, and questionnaire (Li & Chu, 2020), while another n=1 involves a questionnaire, conducted an interview, had field notes, and also conducted a pre and post-test (John et al., 2021). The remaining n=2 (Ratnasari et al., 2019; Arce & Valdivia, 2020) applied the combination of the quantitative method with a quasi-experimental design and both experimental and control groups were present. Lastly, n=1 applied a quantitative method with a questionnaire (Freiermuth & Ito, 2021).

Research Question 3: What is the purpose of conducting studies on the inclusion of gamification in improving reading comprehension?

The research articles in this scoping review revealed multiple aims of conducting studies on the application of gamification in reading. A majority of n=8 studies researched how gamification improves reading comprehension in general, but also in terms of narrative text reading (Ratnasari et al., 2019), reading performance (Chen et al., 2020), and enhancement of vocabulary to aid reading comprehension (John et al., 2021). The educational software, Quizizz and Kahoot! were also present in n=2 (Priyanti et al., 2019; Ratnasari et al., 2019) and n=1 (Mays et al., 2020) of the articles respectively, as a gamification tool due to the game elements present in the application. Another n=1 analyzed the impact of a gamified reading platform and its sustainability (Li & Chu, 2020) whereas n=1 determine the perception and interaction of students with reading difficulties towards a gamified assessment (Reed et al., 2020). The remaining n=1 article discusses the impact of gamification in a virtual setting among EFL (Arce & Valdivia, 2020) and n=1 regarding the motivation of students during extensive reading and promotes L2 reading among them (Freiermuth & Ito, 2021).

Research Question 4: What are the game elements used in gamification to improve reading comprehension?

There were many game elements present in the eligible research articles for this scoping review. Furthermore, none of them were applied individually, instead, it was used in various combinations. The most frequent game element was level with $n=5$ (Chen et al., 2020; Abusa'aleek & Baniabdelrahman, 2020; Kaban & Karadeniz, 2021; Nitiasih & Budiarta, 2021; Reed et al., 2020), whereas, points appeared in $n=4$ (Nitiasih & Budiarta, 2021; Abusa'aleek & Baniabdelrahman, 2020; Mays et al., 2020; Arce & Valdivia, 2020) and immediate feedback (Chen et al., 2020; John et al., 2021; Mays et al., 2020) appeared in $n=3$ articles. Next, leader boards (Chen et al., 2020; Abusa'aleek & Baniabdelrahman, 2020; Li & Chu, 2020) appeared in $n=3$. Time (Mays et al., 2020; Kaban & Karadeniz, 2021), badges (Nitiasih & Budiarta, 2021; Arce & Valdivia, 2020), avatar (Arce & Valdivia, 2020; Reed et al., 2020) and score (Kaban & Karadeniz, 2021; John et al., 2021) were found in $n=2$ articles respectively, whereas reward (Abusa'aleek & Baniabdelrahman, 2020), ranking (Nitiasih & Budiarta, 2021) and user (Nitiasih & Budiarta, 2021) were mentioned in $n=1$ article each. The remaining game elements such as score (Li & Chu, 2020), achievement (Chen et al., 2020), visual status (Chen et al., 2020), goal (Chen et al., 2020), challenge (Nitiasih & Budiarta, 2021), and scoreboard (Mays et al., 2020) were also found in $n=1$ accordingly. However, there were none in $n=3$ (Priyanti et al., 2019; Ratnasari et al., 2019; Freiermuth & Ito, 2021).

Research Question 5: What are the theories used in studies about applying gamification to improve reading comprehension?

There were many theories found in the articles which were used as a reference and guidance to conduct studies pertaining to the usage of gamification to enhance students' reading. Unfortunately, there were none present in $n=6$ (Ratnasari et al., 2019; Chen et al., 2020; Abusa'aleek & Baniabdelrahman, 2020; Kaban & Karadeniz, 2021; Nitiasih & Budiarta, 2021; Freiermuth & Ito, 2021). Self-determination theory was present in $n=2$ (Li & Chu, 2020; Arce & Valdivia, 2020). Nevertheless, theories such as mobile learning theory (Priyanti et al., 2019), Vygotsky's Zone of Proximal Development (Priyanti et al., 2019), schemata theory (John et al., 2021), social constructivist theory (Mays et al., 2020), grounded theory (Reed et al., 2020), constructive learning theory (Li & Chu, 2020), MDA framework (Arce & Valdivia, 2020), and connectivism theory (John et al., 2021) were present in $n=1$ article respectively.

Research Question 6: How effective is the integration of gamification in improving reading comprehension?

All the articles included in this scoping review conducted studies on the implementation of gamification to improve reading comprehension and resulted in a positive yield. The effectiveness was portrayed when $n=6$ (Priyanti et al., 2019; Ratnasari et al., 2019; Abusa'aleek & Baniabdelrahman, 2020; Mays et al., 2020; Kaban & Karadeniz, 2021; Nitiasih & Budiarta, 2021) claimed that gamification enhanced students' reading comprehension due to the inclining progress and better achievement results. Gamification was also claimed to be effective in engaging and motivating students to read in $n=3$ (Li & Chu, 2020; Reed et al., 2020; Freiermuth & Ito, 2021). Academic performance in terms of reading comprehension gradually improved as stated in $n=2$ (Ratnasari et al., 2019; Mays et al., 2020) as the experimental group performed better than the control group in the post-test scores. The remaining studies revealed favorable progress in the production of high-quality annotation (Chen et al., 2020) and advancement in vocabulary (John et al., 2021) in $n=1$ each. The same study also claimed that gamification

advocates a fun and active learning experience for learners. Lastly, n=1 claims that gamification develops students' English reading skills (Arce & Valdivia, 2020).

4. Discussions

4.1 Gamified Reading Comprehension

Students perceive reading as a task that requires great effort and commitment. They refuse to participate in activities as such because it demands constant participation and it implements old-fashioned methods which do not appeal to them. Educators are expected to possess skills with regard to the planning and application of techniques that are interactive and engaging (Rusdin, 2018). The same study states that there are a few criteria to be taken into consideration to match the skill that is being taught, such as the objective of the lesson, students' prior knowledge, selection of suitable strategies, and designing of learning materials. Therefore, teachers were urged to seek an alternate solution that can simultaneously cater to their students' needs as well as promote reading among them and improve their comprehension of the content.

In order for students to be active readers instead of passive ones, they need to be provided with a tool that plays a role of a catalyst that can guide them toward the end goal. Gamification, a suggested tool by various researchers could provide solutions to improve task engagement, boost motivation, and enforce positive learning behaviors. Thus, gamification may just be the solution to problems related to students' reluctance to take part in the learning process (Alsawaier, 2018). This is due to the fact that the game elements present in gamification provide both education and entertainment, thus, the term edutainment. This is deemed beneficial to both students and teachers because it is familiar to them, especially since the younger generation is very well-versed in terms of technology and games. Teachers should take this golden opportunity to use their interests and include them in their teaching to ensure the students are glued to their seats throughout the lesson.

The key point to bear in mind is that gamification is not meant to take over reading activities and turn them into a game but contrarily, it provides a circumstance that enables the students to have fun and willingly be a part of it. The usage of gamification is not limited to merely reading per se but to vocabulary acquisition, sentence construction, and information analysis with connection to pre-existing knowledge, which eventually contributes to learners' reading comprehension (Fathi & Afzali, 2020). As the students are subconsciously acquiring knowledge while having fun with their peers, it is instantly transformed into student-centered learning. Taking these advantages into account, gamification paves the way towards acknowledging its implementation and effectiveness in the educational setting (Alabbasi, 2018).

5. Conclusions

The scoping review shows the identified resources regarding the integration of gamification as a tool to promote reading among English language learners. It also reflects its effectiveness in enhancing the students' process of knowledge acquisition in aspects of reading comprehension as well as performance, literacy, and competency. This review plays the role of a prompt to encourage researchers to initiate more studies to uncover the capability of gamification in the enhancement of reading comprehension.

6. Recommendation for Future Studies

This study provided a scoping review to identify the relevant resources available regarding gamification and its effectiveness in developing students' reading skills in English language acquisition. Although the findings managed to pinpoint a total of 12 articles, it is still deemed insufficient. Therefore, it is recommended that future researchers amplify the information obtained regarding the success of gamification in enhancing reading skills by conducting interviews or surveys with educators who are experienced with the application of gamification in education, to gain more input.

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