

## A Systematic Review on the Use of Gamification in Enhancing Vocabulary Mastery

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### Abstract

Different approaches are needed to arouse the students' interest and motivation in learning vocabulary during the pandemic COVID-19. During the crucial time, gamifications have been really helpful to the educators and students in enhancing vocabulary acquisition. To answer the research question on the type of games and the role of gamification in improving students' vocabulary, The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) was used to systematically review 16 articles sourced from Google Scholar and Scopus. Most of the articles highlighted gamification used in improving vocabulary learning among different stages of students. These articles showed that ready-made games or developed games can be used as useful tool by the educators to help students in improving their vocabulary knowledge, vocabulary motivation and in the meantime, others language skills such as speaking and reading skills. Generally, the review is valuable to the educators to know that gamification can be a useful tool in learning vocabulary no matter the learner's age.

**Keywords:** Gamification, Mobile Application, Vocabulary, Motivation

### Introduction

In the end of 2019, CoronaVirus Disease-19 (COVID-19) started to boom out in the whole world resulting in 191 countries closing all the face to face education systems that involved 1.5 billion students from preschool up to tertiary education. During the school closure, almost half of the students around the world have barriers learning online. About 50% of 826 million learners in the world do not have a household computer and 56 million students cannot attend the online classes by their smartphones due to limited internet access (UNESCO, 2020).

As a result of the Covid-19 epidemic, students' learning has switched to home-based learning (HBL). It was discovered that students struggled with vocabulary development and were uninspired to study, particularly during HBL, making ESL learning more challenging (Yuskandina et al., 2021). In ESL, vocabulary is vital in the development of four language skills, and ensuring students' vocabulary mastery is critical. Being unable to converse in English will

limit the students' opportunities to interact with people from different cultures (Shamsan et al., 2021). As the country's rapid development, students must be able to communicate effectively in English. Unfortunately, the students' level of proficiency has sparked a lot of controversy in the community. On the other hand, the industries pointed out that the majority of degree holders were unable to seek employment because they could not communicate effectively in English.

Due to a lack of language practice, these students are having difficulty remembering the words they have learn, and typical chalk and talk teaching methods must be modified to capture students' attention (Harris, 2022). As a result, teachers are now urged to employ more inventive tactics and to place a greater emphasis on engaging pupils while they study. Teachers must, in fact, assist students in mastering vocabulary. Learners can increase their vocabulary with their assistance.

From the online classes conducted during the pandemic COVID-19, technology has been fully used and to avoid bored feeling among the students, gamification is used widely as one of the education tool. In Tamtama et al (2020), gamification is defined as an educational approach by using video games and playing elements to encourage students to learn. Gamification also can be explained as the application of game features (users, tasks, points, rewards, levels and achievements) and game thinking to non-game activities (Kiryakova et al., 2014). Another definition for gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning and solve problem" (Kapp, 2012). In the stage-based theory of cognitive progress, he inserted play and put it as an important role in developing children's mind. He believed that by playing, the cognitive growth can be built up by assimilation and accommodation (Piaget, 1962).

To have an attractive game, there are few steps in developing a game for education that has to be counted in such as determination of learners' characteristics, learning objects' definition, creative educational content or activities and addition of game elements and mechanism (Kiryakova et al., 2014). Other than that, team management, team interaction, team competition and reward system are considered as the features to develop collaborative game applications (Kotsis et al., 2021). In addition, Shi & Shih (2015) listed some factors that are used to create fun games such as game goals, game mechanism, interaction, freedom, game fantasy, narrative, sensation, game value, challenge, sociality and mystery.

Game designers and educators should analyse the steps and features needed before designing new games that can encourage learners happiness and be active learners (Andreani & Ying, 2019). By using the technology, the students' perception of learning vocabulary can be changed as the games are encouraging, entertaining, teaching and promoting fluency (Rahman and Angreano, 2020). Along with it, getting badges, rewards and completing missions make the learner more motivated to play and at the same time they are learning unconsciously and promoting their cooperation in solving the problems (Dindar et al., 2021). By considering the features, gamification can be one of tools that educators use in teaching and learning process and shows lots of impact in students' achievement.

Many studies have proved that gamification can enhance students' motivation and knowledge. As in Mohammad et al (2018), gamification is adaptable to various platforms and

may support active learning in students. In the study, the researcher categorized gamifications into six categories which were courses without online support, massive open online courses, blended or flipped classrooms, e-learning site, gamified platform and mobile learning. Even though there are different categories, gamification is still able to encourage and motivate students in learning. Supported by Ab. Rahman et al., (2018) that the students agreed that gamification techniques are also able to increase the higher education student's engagement and their learning experience.

To investigate more studies focusing on vocabulary and gamification, this systematic literature review was carried out.

### **Research Question**

This study conducts a systematic literature review of past studies on the elements of gamification in learning vocabulary. The research question for this systematic literature review is as follows:

RQ1: What are the games applications that are used to enhance vocabulary?

RQ2: How can gamifications enhance the learning process of vocabulary acquisition?

### **Materials and Methods**

This systematic review is using the method of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRSIMA) which consists of four processes. The processes are identification, screening, eligibility and included as shown in Figure 2. Due to its comprehensiveness and ease of adaptation, most researchers used PRISMA in their studies. This paper aims to identify the gamification strategies and applications that are used to enhance students in mastering English vocabulary. By this systematic review, the readers are provided with different mobile games applications or computer-based games that help the students to master their vocabulary. The electronic journals were reviewed to get the information. The journals for this study were accessed through Google Scholar and SCOPUS. Journal articles were chosen based on the date between 2018 and 2022.

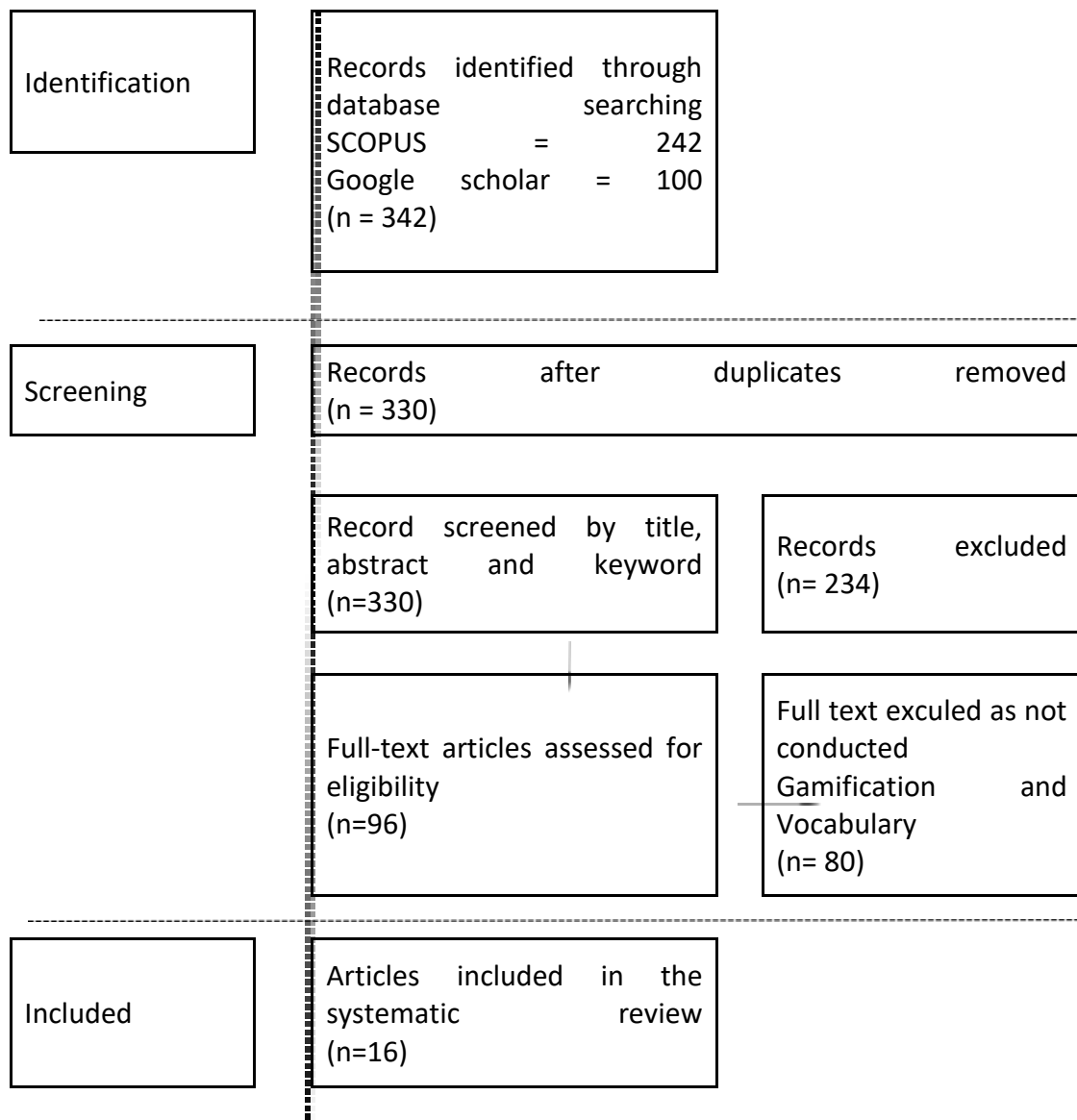


Figure 1: PRISMA systematic review

**Phase 1: Identification Phase**

In this phase, there were two stages involved which were collecting suitable articles and choosing appropriate articles that fulfilled the inclusion and exclusion criteria. Limitation of access to some journals may exhibit this study. This process only focused on the journal database and did not analyze other literature from other sources such as book chapters, newspaper cutting and technical report.

Thus, the research was focused to analyze and make comparisons between journals from different sources. The primary databases used in this research are Google Scholar and Scopus, as shown in Table 1. In addition, the journals that were used in this study were published between 2019 and 2022. The range of years was chosen to see how gamification applied before the pandemic phase until the endemic phase. In searching the suitable journals, the combination of keywords played an important role. The keywords used were gamification, game application and English vocabulary.

Table 1

*Search string used in the study*

Database	Keywords Used
Google Scholar	"Gamification", "Game application", "English vocabulary"
Scopus	TITLE-ABS-KEY (( *gamification* OR *game application* AND *vocabulary* OR *English vocabulary*))

**Phase 2: Screening Phase**

In this phase, the suitable papers found in Google scholar and Scopus were chosen. Any duplicates were removed. Based on the first screening step, 12 duplicate articles were removed and 330 articles remained for further screening. By considering the title, abstract, keywords and open access articles, 140 articles were excluded. The remaining were re-reviewed and re-examined to confirm they met the researcher's criteria.

**Phase 3: Eligibility Phase**

Next, the researcher reviewed the paper based on the eligibility criteria which are shown in the table below. The criteria were considered as inclusion criteria. This was an important part where it would ensure the best quality journal was chosen.

**Phase 4: Exclusion Phase**

Then, the researcher re-read the article thoroughly in the eligibility phase, 79 articles were excluded from this systematic review. The exclusion criteria of the articles are shown in Table 2.

Table 2

*Exclusion criteria*

Exclusion Criteria
Journal article are not published between 2018 and 2022
Text not written in English
Not only focused on learning and enhancing English vocabulary
Book, Book chapter, proceedings,

**Results**

The findings of this research will be in-depth reviewed in this section. After the four phases of choosing the articles that are evaluated, there are only 15 articles that fulfill the criteria. Many different researchers around the world have studied the effect of using gamification or game application in enhancing vocabulary mastery among preschool learners till university students and the results from these articles are as shown in Table 3.

Table 3

*Games and its effect on the vocabulary learning*

Author/Year	Country	Aims of the study	Samples	Name of game	Findings
Saleh &Althaqafi, 2022	Saudi Arabia	To investigate the effect of using educational games on the vocabulary learning of young children	40 Arab young learners	Educational games (ball game, selling and buying, washing line, hidden card)	Applying educational games as a learning techniques increased learner engagement, improved knowledge absorption and retention, gave learners the opportunity to see real world application
Panvilova et al. , 2020	Rusia	The purpose of the study is to consider the features of the functions and operation schemes of educational mobile games for learning English and Russian in terms of comparing the focus of the content of these application, their effectiveness, productivity and the degree of influence on the learning process.	342 participants from 3 Russian higher education, 158 participants from 2 Kazakh Universities	First stage: 55 educational games used Second Stage, there are two part where in the first part, using Quizlet and Memrise and in the second part using ELSASpeak and Tandem	80-90% vocabulary can be memorizes by the students with the help of the mobile applications

Author	Country	Aims of the study	Samples	Name of game	Findings
John, et al., 2020	Malaysia	Balloon Vocabulary development to help Ibanese tertiary learners to enjoy their reading and develop their vocabulary repertoire	125 tertiary level Iban learners	Mobile App "Balloon Vocabulary"	The process of experiencing gamification and language games has led the learners to discover their skill related to vocabulary. In addition, the learners' passion to learn also increased when using technology in learning.
Li (2021)	China	to identify the impact of game-based vocabulary learning application (APP) on the vocabulary learning achievement, motivation and self-confidence among Chinese EFL students	70 college students	Game-based vocabulary learning application (Baichizan)	Chinese EFL students who used game-based vocabulary learning APP show a higher achievement in vocabulary learning, motivation and self-confidence than using conventional methods.
Dindar et al., 2021	China	To compare how gamified cooperation and competition impact task effort, learning achievement, motivation and social	75 participants	Baichizan mobile language learning app and WeChat	The participant have improved their English vocabulary knowledge when they are using gamified cooperation

		relatedness in English vocabulary learning with a mobile application.			and competition
Peake & Reynolds (2020)	France	To examine student attitudes to language learning in relation to online video gaming in English as leisure activity.	90 French speakers of English	Online games	88.4% of the participants said that they improved their English with gaming because they could practice and learn while they played the games.
Author	Country	Aims of the study	Samples	Name game	of Findings
Wu et al., 2020	China	to identify the effect of English vocabulary learning through digital games collected from English language database such as WOS and ERIC from 2008-2018	-	Digital games	Digital games played a significant role in promoting English vocabulary learning.



Rahman and Angreano(2020)	Indonesia	To analyse the effect of the use of computer Role-Playing Game on students' vocabulary mastery	20 students who know how to operate a computer and engage with it continually	computer Role-Playing game (RPG)	The selected computer RPG is effective to develop vocabulary mastery.
Tamtama et al., 2020	Indonesia	To approach the learning of English by using Gamification method	Kindergarten children	Mobile phone-based application with video games	The learners enjoy learning as they love to see something new and high in creativity.
Cerezo et al., 2019	Spain	To use the power of multi-channel stimuli of a mobile-based hologram application in order to motivate students and improve their learning experiences	70 Spanish preschool children	3D Holographic robot	The study showed that the use of the holographic mobile-based application had a significant impact on the children's motivation and improved their performance too.
Author	Country	Aims of the study	Samples	Name of game	Findings

Andreani & Ying, 2019	Indonesia	To see how PowPow, a game application in supporting Indonesian students learn English Vocabulary	35 elementary Indonesian students aged 7 to 12 years old	"PowPow" interactive game	The students' interest and motivation have increased by using the PowPow game. In addition, the students' English vocabulary skills also improved after using it.
Fithriani, 2021	Indonesia	The evaluate the effectiveness of gamified vocabulary learning in a mobile-assisted language environment on Indonesian adult EFL learners' vocabulary learning outcomes and to explore their perceptions of its benefits	74 first year students in a state university	Quizlet (a mobile and web-based application)	The participants found that mobile-assisted gamification benefits their vocabulary learning aspects which are in learning outcomes, enjoyment and motivation.
Rakangthong & Yimwilai 2020	Thailand	To investigate the effects of digital game resources in enhancing EFL students' English vocabulary knowledge and to investigate the opinions of the	70 EFL students - 35 Science-Math program students & 35 Chinese-English students	Digital game resources	The EFL students showed improvement in their vocabulary knowledge by using the digital game resources.

			students about learning vocabulary through digital game resources		
Albeshi & Gamlo, 2022	Saudi Arabia	To investigate the effects of mobile games on EFL students' vocabulary acquisition via the "Quizziz" application	56 female foundation year students from a Saudi Arabian University	"Quizziz" application	It was an effective way to facilitate, retain and alleviate cognitive load during vocabulary learning.
Author	Country	Aims of the study	Samples	Name of game	Findings
Najmi & Nasebakht, 2021	Iran	The effect of using an English vocabulary application called "Drops" as a tool in helping English as foreign language (EFL) learners in pre-intermediate level learn English vocabulary.	40 Iranian female and male students between 12 and 16 years old.	"Drops"	By using technology such as digital games, the participants who use it performed well in the post test and learned vocabulary.

Kosemehmetogu,2019	Turkey	to investigate the effect of hidden object games on vocabulary learning	56 pre-intermediate level young adult learners in a university preparatory school	A Hidden Object Game	The findings showed that the hidden object game was a significantly effective way of facilitating vocabulary.
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### Research Question 1: What are the games applications that are used to enhance vocabulary?

From the table above, it was found that there are different games and applications used by the students from different stages of education in enhancing their vocabulary. Saleh & Althaqafi (2022) in their research mentioned the educational games that are used by the preschoolers namely as ball game, selling and buying, washing line, hidden cards and card race. By using these educational games, the teacher needs to prepare the pictures or any teaching aids to ensure the games will be played smoothly. Some of the researchers used new application that built by themselves such as Balloon Vocabulary (Saleh & Althaqafi, 2022), Kindergarten quiz (Tamtama et al., 2020), HolograFX game (Cerezo et al., 2019) "PowPow"(Andreani & Ying, 2019) and "Drops" (Najmi & Nasebakht, 2021) to develop and enhance the learners' vocabulary. Meanwhile other researchers were applying any mobile applications or games that have existed. There are two researchers who are using Baichizan in their research (Li, 2021; Dindar et al., 2021). Quizlet is also a well-known application among the researchers where it was used in (Saleh & Althaqafi, 2022; Fithriani, 2021). Others were using games applications in their research to investigate the effect of playing games in learning vocabulary. The games played in Peake & Reynolds (2020) were League of Legends, Counter Strike, Minecraft, Overwatch, Call of Duty and World of Warcraft. On the other hand, Role-Playing games (Rahman and Angreano, 2020) and Quizziz (Albeshi & Gamlo, 2022) also found use in the vocabulary learning process.

### Research Question 2: How can gamifications enhance the learning process of vocabulary acquisition?

Most of the researchers found that using educational or mobile games in enhancing vocabulary acquisition increased the learners' motivation and engagement (Saleh & Althaqafi, 2022; Panvilova et al., 2020; John, et al., 2020; Li, 2021; Dindar et al., 2021; Tamtama et al., 2020; Rakangthong & Yimwilai, 2020). When the learners are highly motivated, it will be easier to improve themselves in mastering the vocabulary. Other than motivation, the researcher also found that by using technology are more convenient and acceptable among the learners compared to conventional method (Fithriani, 2021;-Rakangthong & Yimwilai, 2020; Albeshi & Gamlo, 2022; Najmi & Nasebakht, 2021). In the current situation, mobile applications and games are really familiar among the learners and they are also good technology learners. By having these factors, applying technologies and gamification in learning vocabulary would be an easier method for the teachers. As mentioned in Tamtama

et al. (2020), using games make the students feel more comfortable and confident to learn foreign language, In conclusion, from the tables show that having extrinsic motivation and learners' acceptance in using digital resources in learning vocabulary, the mastery of vocabulary achievement can be increased (Li, 2021; Dindar et al., 2021; Peake & Reynolds, 2020; Wu et al., 2020; Rahman and Angreano, 2020).

### **Discussion**

There are different mobile applications and games used in the study. Each mobile has almost the same characteristics that motivated and encouraged the students to have high engagement and motivation in learning vocabulary. The games used in the study were either the computer games, mobile games or educational games which proved that it helped the students to engage and learn vocabulary more than they could focus during in class learning (Peake & Reynolds, 2020).

There are several games that have been developed by the researchers to improve the interest in learning vocabulary such as PowPow (Andreani & Ying, 2019), Kindergarten quiz (Tamtama et al., 2020) and Balloon Vocabulary (John, et. al., 2020). In addition, other researchers were using ready mobile game or application in their study such as Quizlet (Panvilova et al., 2020; Fithriani, 2021), Baichizan (Li, 2021; Dindar et al., 2021), Memrise (Panvilova et al., 2020), Quizziz (Albeshi & Gamlo, 2022) and Hidden Game (Kosemehmetogu, 2019). However, educational games such as Hanging Line, Hidden Cards and Selling Buying games which applied traditionally in class with kindergarten students also showed a positive impact to the learners in terms of motivation, fluency and fun learning process (Saleh & Althaqafi, 2022). Some computer online games also applied in the study where the participants could interact with other players and were able to apply speaking skills while playing the games. Usually these online games allow multiplayer from different countries to communicate and English will be their medium of communication (Wu et al., 2020). The most popular games are Counter Strike, Minecraft, Call of Duty, World of Warcraft, League of Legends and Overwatch (Wu et al., 2020).

Either it was a developed game or ready mobile applications, the impact of using gamification positively showed in every study. Consequently, it was found that the vocabulary acquisition among the students increased as they used gamification in their learning. For example, reported in Panvilova et al (2020), about 80-90% of vocabulary could be memorized by the student easily after using games by exploring and learning the new words as the games provided a list of vocabulary based on the player's level either beginner or advanced. Similarly, in Li (2021), the experimental group was able to improve their vocabulary achievement effectively by using the application rather than the conventional word list. Clearly, by using gamification, the students were applying their language learning strategies indirectly and continuously to make themselves a good language learner.

Without a doubt, games have never been apart with attractive visuals and audio due to attracting the player to keep on playing the games. Students expressed their excitement to have sensory experience in using games as learning tools by commenting on the graphics and colors used in the applications (Panvilova et al., 2020). This shows that learning vocabulary via gamification also involves creating mental linkages and applying the images and sound along the games makes the students apply their memory strategies (Oxford, 1990). Memory,

on the other hand, goes beyond this one-dimensional view of learning and instead focuses on attending to, learning, linking, remembering, and applying the thousands of bits of information and abilities we come across on a daily basis. Memory is the only proof that something or someone has been learned for educators (Banikowski & Mehring, 1999). As in the study by Rahman and Angreano (2020), the finding was parallel with it where by using games, students use their memory strategies when they need to keep new terms easily and in long-term.

In addition, they also did repetition in learning vocabulary when using gamification as they needed to repeat the level if they failed to achieve the requirement. It is found in Peake & Reynolds (2020), the game that is played by the students has a few levels that need to be completed before they can move to another chapter of games. In each level, there are several new words added and make the level harder than before. The students kept repeating the level because they were also eager to win the game. By doing repetition, the students were applying their cognitive strategies (Oxford, 1990) and kept practicing which parallel with a good language learner behaviour (Rubin, 1975). O'Malley and Chamot (1990) reported that repetition is one type of cognitive strategies including resourcing, translation, grouping, note taking, deduction, recombination, imagery, keyword, contextualization, elaboration, transfer and making inference.

Besides vocabulary acquisition, other skills also developed during the learning process by gamification method. Found in Panvilova et al (2020), by using ELSASpeak, the students developed their vocabulary and speaking skills by listening and repeating the words while recording themselves. Similar to Peake & Reynolds (2020), the player is able to speak in English with other players when they are playing online games in many ways such as by sending instant messaging, chatting online, and talking by headphones.

### **Conclusions**

In conclusion, gamification approaches are not a new technique in the teaching and learning process. Gamification or play while learning have been introduced by (Piaget, 1962) and proved that by using game in learning, students able to improve their vocabulary and motivation (Saleh & Althaqafi, 2022; Panvilova et al., 2020; Li, 2021; Cerezo et al., 2019). For this systematic literature review, the studies that were analyzed were 16 articles on gamification and vocabulary learning found in Google Scholar and Scopus. These studies highlighted various types of games that are found can be manipulated to improve the learners' vocabulary acquisition and learning motivation and at the same time, playing games is also able to upgrade other language skills such as speaking skills and listening skills. Other than that, gamification also developed the language learning strategies among the learners whether they are good language learners or low proficiency language learners indirectly.

From these reviews, games are suitable to be used with students as early as in kindergarten or as older as university students. The types of games used can be manipulated based on the learners' level, background, and focus. Besides, the students can play the game either in group or individual. In both situations, the students need to cooperate or collaborate and to be competitive as they need to complete tasks or missions.

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