



## Using *Kahoot!* As a Multimodal Tool: A Literature Review

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### Abstract

Using different learning materials for language teaching has become more common as technology develops and has started to be used in a lot of educational settings. One of these tools is Student Response Systems which have been used for many years. After a couple of years, game features have been added and it turned into a new concept known as Game-based Online Student Response Systems. *Kahoot!*, which is a game-based platform, is one of the best-known examples of these tools. It can be used for different purposes such as assessing students' performances, reviewing their knowledge, or as a new path to change traditional classroom activities. This review article aims to present the results of different studies on this subject by focusing on the effects of *Kahoot!* on classroom atmosphere, learning performance, students' and teachers' attitudes and perceptions.

**Keywords:** *Kahoot!*, student response systems, game-based response systems, digital learning, classroom dynamics, motivation

## 1. Introduction

It is a well-known fact that the motivation level of students in a classroom is one of the key factors that affect the quality and speed of the language learning process and keeping students' motivation and concentration is a big challenge that needs to be overcome because the absence of it can create a negative atmosphere and can cause the deficiency of expected learning outcomes in the school environment (O. L. Liu, Bridgeman, & Adler, 2012). This problem gets even bigger in higher education since there is little interaction between students and teachers. Research conducted on student motivation and efficacy has shown that the more the students become active in the learning process, the faster and better they learn (Butler, 1992; Murray, 1991). For this reason, educators tried to find various techniques such as dividing the class into smaller groups, asking questions to the listeners, giving students some situations to work on, organizing debates, getting help from written materials, role-play activities, using response systems, using videos and audiovisual aids and improving presentation skills to create more interactive classroom environments (Steinert & Snell, 1999).

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## 2. Student Response Systems and Kahoot

In the sixties, student response systems were created to make larger classes more interactive (Judson, 2002) and these systems have been used since the early seventies (Bessler & Nisbet, 1971). Student response systems are used by instructors to ask a question or apply a quiz during a lecture. Even though these systems are proved to be handy, game-based student response systems took things a little further. Transforming these quizzes into little games increased the participation of the learners, motivated them, and turned classrooms into more enjoyable learning settings (Licorish et al., 2017; Wang & Lieberoth, 2016; Wang, 2015). Licorish et al. (2017) conducted a qualitative study to focus on the effects of the transformation of SRS into Game-based Student Response Systems (GSRS). The study of Licorish et al. (2017), overlapping with its predecessors, concluded once again that *Kahoot!* changes the aura of the classroom makes learning more entertaining and thanks to the anonymity factor it provides, it is also encouraging for unwilling learners.

Different paths have also been opened for creating interactive classes after some advancements in the technological side of education and after students have started to carry their devices to the school environment (Bradford-Networks, 2013). Another methodological advancement combined with technology worth mentioning is game-based learning. Researchers argue that if they are well-designed enough, video games can be one of the best learning materials because students become active and focused learners while playing them without even noticing that they are learning (Gee, 2003). Different Student Response Systems have added game features to increase student motivation. The application *Kahoot!* is accepted as the first SRS designed to create a game experience based on intrinsic motivation (Malone, 1981). This program combines role-plays, video and audio-visual aids, and audience responses. Although other SRSs have some game features, only *Kahoot!* has been designed as a game-based SRS from the beginning (Wang, 2015). The concept of *Kahoot!* is combining SRS and gaming in one learning platform. It aims to enhance student motivation, engagement, and focus on a better classroom environment. Baker et al. (2010) suggested that if students get bored in a computer-assisted learning environment, learning can be affected negatively and behavior problems can occur (Baker et al., 2010). *Kahoot!* can be defined as a game-based learning platform that can be used to review students' existing knowledge as well as being used for formative assessment. It can also be seen as a way of changing traditional classroom activities. This platform is one of the most popular game-based learning platforms and it has over 70 million users and it is used by half of US K-12 students (Lunden, 2018). Since 2013, more than 4.4 billion players from 200 different countries have used *Kahoot!* (Kahoot, 2021). The platform was introduced in 2013 and since then, there have been many studies on how *Kahoot!* affects learning in the classroom knowledge (Huang, 2015; Guaqueta & Castro-Garces, 2018; Medina & Hurtado, 2017; Wichadee & Pattanapichet, 2018; Wang & Lieberoth, 2016; Iwamoto et al., 2017). However, there are not a lot of studies analyzing the results that have been found so far.

This article includes the review of literature about the effects of using *Kahoot!* for learning and it looks into the difference between students' learning performances when *Kahoot!* and other teaching tools are used. It also investigates whether it changes the classroom atmosphere and how useful the platform is from teachers' perspectives because some teachers have the idea that these kinds of competitive gaming platforms can result in increasing students' anxiety levels. Thus, the present review study also includes how *Kahoot!* affects students' anxiety levels.

## 3. *Kahoot!* As a Booster

Kapuler (2015) added Kahoot to his list of the best-known online applications to be used in the classroom setting. He also suggested that Kahoot was spotted as the 36th application on the list when the applications were rated in terms of their effectiveness and usefulness. By looking at this information, it can be concluded that Kahoot has the potential to be a good resource for education. Although the advantages of it weren't proved because of the studies where *Kahoot!* has little or no effect, there are a lot of studies that show the effectiveness of using online games to teach content vocabulary, and Kahoot is

included in this category (Huang, 2015; Wolsey et al., 2015; Dalton & Grisham, 2011). In this sense, two similar studies (Guaqueta & Castro-Garces, 2018; Medina & Hurtado, 2017) implemented in South America focused on *Kahoot!* and vocabulary acquisition. The results showed an increase in vocabulary knowledge. Likewise, Wichadee & Pattanapichet (2018) conducted a study in Thailand. They revealed that the students using *Kahoot!* outperformed the control group in the vocabulary and grammar tests. The study was carried out to find out the effects of an online application on students' learning performance and motivation. It was a quasi-experimental study with two groups of students. *Kahoot!* was used for teaching the experimental group while the control group was taught with the traditional teaching method. Pre-tests, post-tests, and questionnaires on the students' motivation and attitudes toward gamification in language learning were the instruments used in this study. The findings showed that there were statistically significant differences related to learning performance and motivation between the two groups. The experimental group got higher scores than the control group, and the motivation of students in the experimental group was much higher than that of the control group.

In their review study, Wang & Lieberoth (2016) tried to take things to another level. Their study is different and innovative in that they tried to take a specific look at the game-based learning pedagogy with the integration of *Kahoot!*. In their experimental study, they checked for the effects of using points and audios of *Kahoot!* to increase motivation, participation, joyfulness, and other aspects. They conducted experiments on four different groups with which *Kahoot!*, with audio and points is used in different combinations. The study has demonstrated that using different features and tools of *Kahoot!* interactively and interchangeably affects both the classroom environment and the learners individually in a positive way in terms of motivating, entertaining, and engaging them while doing a task. A similar one was conducted by Huang (2015) to see the effects of technology combined with the traditional method on vocabulary acquisition. In his study, there were 40 second-grade students. Two separate classes were arranged. The experimental group was provided with vocabulary interventions with technological tools in which *Kahoot!* was included while the control group received the instructions through traditional methods such as paper-pencil and textbooks. The results of pretests and posttests applied to quantitative data showed that the students' performances in the experimental group were much better than the control group. By looking at these results, one can conclude that in most situations, *Kahoot!* is a facilitating software in terms of enhancing the learning performances, motivation, and language proficiency level of students.

In their study, Biçen and Kocakoyun (2017) focused on student opinions on issues in the application of gamification methods, the environments that gamification can be included, and the methods by which gamification should be carried out. This study had three dimensions as "General Perceptions about Gamification Method", "The Effectiveness of Kahoot Application" and "Evaluation of Kahoot Environment". The data collected showed that gamification increases students' interest in the lesson and makes them more enthusiastic about learning. It was also found that by helping and supporting each other, students had a sense of collaboration. After seeing their achievements, they had a desire to learn more. Students also suggested that it becomes easier to remember information with the help of gamified materials. It was stated that some teachers are worried that competition can increase the anxiety level of some students. However, Biçen and Karakoyun (2017) observed that competition enabled students to make their response time shorter and made them understand difficult topics in a shorter period.

Correspondingly, in their study, Guardia et al. (2019) worked with 104 students who studied in the departments of Business Management, Economics, and Management, Marketing and Commercial Management and Law and Journalism students who were studying one of the following subjects: Cost Control, Urbanism and Environment, Information Law, Treatment of Commercial Information and Commercial Distribution. The study aimed to enhance the learning outcomes of the students as well as implementing them into cooperative or coordinative works. In the end, learners' motivation levels were also expected to raise. The results of the data showed clearly that most of the learners agreed that *Kahoot!* is an effective tool for different kinds of aims. This can be

deduced from the results easily since the levels and departments of the students and as a result, their learning goals varied greatly. However, they did not demonstrate significant differences in terms of using *Kahoot!* as a booster in their higher education processes.

It's obvious that *Kahoot!* is a multimodal tool. However, the software is mostly used for language learning which is a complex and variable goal for learners. While choosing the perfect method and techniques is a critical domain, choosing the best materials or tools is equally significant. In this sense, Liu and Wang (2017), conducted a wide and detailed study with 18 language learners and a language teacher. The software *Kahoot!* was used daily by the Chinese language teacher and as a result, the researchers observed that most of the participants (high school learners) improved their reading and speaking and slightly, their listening skills, too. In conclusion, according to Liu and Wang's (2017) study, students even improved their vocabulary skills, which are quite difficult for a language like Chinese, to some extent. The motivating and competitive effects of *Kahoot!* provided gradual success for learners. Even though the study has its deficiencies and limitations, it corresponded with most of the others. In their study, Tan Ai Lin et al. (2018) focused on the suitability of Kahoot for higher education in the Malaysian context. It examined the ability of *Kahoot!* to induce intrinsic and extrinsic motivation and to foster and reinforce learning. Researchers designed their study based on qualitative and quantitative data. They prepared and used a questionnaire with close-ended and open-ended items. The instrument was implemented to 51 undergraduate students of English for the Media in Universiti Sains Malaysia via a Google Forms key. The participants completed the questionnaire after they had been exposed to *Kahoot!* for 14 weeks. Each session included an interactive quiz with 10 to 14 items asking about the day's lecture. After data analysis, the researchers came to a similar conclusion to the previous studies mentioned and it was found that *Kahoot!* was a beneficial platform because it increases students' motivation and engagement as well as supporting and speeding the learning process.

Bawa (2019), conducted a study that aimed to examine the value of using GSRs, compared to traditional teaching methods. The selected platform was *Kahoot!*. The study tried to find out if the performances of learners change when they are exposed to *Kahoot!* and which factors of *Kahoot!* are interesting for students. The participants were 96 Introduction to Business course students that were taught by three instructors. Researchers collected qualitative data with the help of students' final exam scores. In the experimental parts, normal course materials were used for the first half of the lesson. In the 7 remaining weeks, *Kahoot!* was used to support traditional methods. The platform wasn't used by the control group. Students' final exam scores were compared to the first exams to see the effects of Kahoot intervention. Qualitative data were collected through a survey including three questions and a reflection journal. After data analysis, it was found that *Kahoot!* was a well-designed and useful platform because it helped students increase their performance scores and spark their enthusiasm and engagement.

Iwamoto et al. (2017) conducted a pilot quasi-experimental action research study to introduce and test how effective a pedagogical approach for test- preparation is, which uses gamification via *Kahoot!* The participants of the study were 49 undergraduate psychology students. The platform *Kahoot!* was introduced to the students included in the experimental group. Both the experimental group and the control group were exposed to the same lectures, materials, and the same topics to discuss during the lesson. The difference was that the experimental group participated in online quizzes through *Kahoot!* in the last 10 minutes of the lesson while the control group continued till the end of the class. Both the control and experimental groups were given the same high-stakes multiple-choice exam in their respective classes on the same day. The scores from both groups were analyzed to see if there is a statistically significant difference between the two data. Qualitative feedback was also taken from all participants through a questionnaire. The results of the analysis revealed a significant difference between the scores of students who used *Kahoot!* and the ones who didn't use it. It can be concluded that platforms like *Kahoot!* can be utilized to make high-stakes examination scores better at the university level. Because the participants stated that their feelings about *Kahoot!* are positive. The study also revealed that changing the atmosphere of the classroom by adding fun and engaging tools enhances the

quality of the academic performance of the students. Similarly, Turan and Meral (2018) conducted a study that aims to analyze the effects of online student response systems on students' success, engagement, and anxiety levels. A quasi-experimental design with pre-test and post-test groups was used in this study. Both the control group and the experimental group consisted of 23 students. Teaching the Living Democracy section of the Social Sciences course book for 7th graders was covered through Kahoot for the experimental group and for the control group non- GSRs was applied. The teacher's teaching role was the same in both groups. A multiple-choice achievement test related to the chapter that was covered during the study was prepared with the aim of seeing the differences between question and answer systems of both methods. As a result, it was seen that students' level of achievement and engagement in the experimental group was higher than the control group. Besides, the anxiety levels of the students in the group that used *Kahoot!* were lower than the group of non- GSRs users.

#### 4. What Do Teachers Think?

In their mixed-method study, with the participation of 15 preservice teachers, who took a plant morphology course, Yapıcı & Karakoyun (2017) observed that *Kahoot!* satisfied the preservice teachers. They pointed out that *Kahoot!* made the classroom environment entertaining and they also said that *Kahoot!* provided them with meaningful and permanent knowledge by reinforcing what they already know. These common views are not just limited to foreign language teaching and learning. By examining the literature, it is obvious that there are a lot of classes and courses aside from language classes that use gamification techniques and results are promising. The study of Yapıcı & Karakoyun (2017) is one of the many others that support the idea of adapting and using *Kahoot!* for different teaching purposes. Thanks to the advantages and multimodality of *Kahoot!*, even preservice teachers, who generally have a hard time during the initial phases of being a teacher, admired the positive effects of *Kahoot!* and what it offers for an easier teaching experience. In a study conducted by de Sousa (2018) about collaborative teaching in the aspect of evaluation, students were activated as a part of the assessment processes along with the teacher. Thanks to *Kahoot!*'s simple interface and practicality, students were able to learn the processes quickly and collaborated by creating quizzes or surveys along with the facilitation of their teacher. It was observed from the findings of the study that *Kahoot!*, thanks to the involvement of the learners in the specific process, increased their self-assessment skills along with their self-esteem and comfortability about their errors. Thus, as a natural result of these, the workload of teachers has diminished considerably. Despite the possible negative effects, using *Kahoot!* as a different source for teaching has been found to be worthy.

Concordantly, in their study on a similar topic which was carried out with the participation of high school teachers and lecturers, Nugroho and Nur (2018) pointed out that most of the participants agreed that *Kahoot!* is a practical, usable, and easy tool that decreased workload for teachers and creates energetic and fun classroom environment. So, just like the results of the studies aforementioned in this current one, the study of Nugroho and Nur (2018), it was demonstrated once again that *Kahoot!*, integrates and increases the enthusiasm levels of learners and assists teachers. The data of the study, as its title implies, were collected based on a history learning context for the high school level.

By looking at studies that were carried out in very different contexts above, the common result is that no matter what the teaching environment's goal and level are, *Kahoot!* has somehow a useful tool that assists learning processes. Even if it's a high school, a college, or maybe an elementary school context, one thing is for sure that *Kahoot!* has proven itself to be useful and fun for both the students and the teachers as well.

#### 5. The Deficiencies of Kahoot!

Not all studies focusing on the effectiveness of *Kahoot!* found it more effective than the other SRS platforms. For example, in their study with Korean EFL students at the university level, Reynolds and Taylor (2020) found that there wasn't any statistically significant difference between the group that used

*Kahoot!* for vocabulary acquisition and the traditional group. For this reason, they do not accept the hypothesis claiming that *Kahoot!* effects students' vocabulary learning performance in a positive way. However, they also state that this rejection doesn't mean that *Kahoot!* causes learners to perform poorly. Both methods can be used by instructors. In the qualitative part of the study which some questions about *Kahoot!* are directed to the instructors, similar results were obtained. Although instructors had positive attitudes towards *Kahoot!*, they were not completely sure about its efficacy. Similarly, Omar (2017) focused on the effectiveness of *Kahoot!* activities in terms of feedback quality. The results she found showed that the guidelines used for performance evaluation are not clear so students cannot get high-quality information about their progress and the analysis of it. Another criticism is that peer and teacher dialogue is not encouraged during the activities and the time in which the answers are revealed is too limited to discuss the answers to the questions and detect the reasons for their mistakes. The reasons why *Kahoot!* wasn't effective in some classes may be related to challenges that occur during lessons. Wang and Tahir (2015) stated that the most important challenges that were mentioned by students include having difficulty in reading and answering the questions on a screen, feeling under pressure due to the time limits, being afraid of making mistakes while the teachers stated that some questions aren't suitable for proficiency level of students, being expected to answer as quickly as possible cause students to answer without reflecting on what they already know and some teachers don't have the necessary knowledge to use the application.

## 6. Discussion

Based on the results of most of the studies that are discussed and reviewed in this present article, it can be deduced that *Kahoot!* is a web tool that offers many different features that are quite handy in terms of making classroom environments enjoyable, competitive and novel. Also, it is clear that *Kahoot!* is a multimodal tool since it is not limited to a subject or area. It was tested within contexts like teaching engineering, medical skills, or language. Despite the dissimilarities of these contexts, most of the results overlapped or supported one another. The findings of studies that were examined indicated that utilizing games in the learning environment can make students more interested in the content of their lessons and increase their desire for success, which gives them the necessary motive to be more active in class, confirming the results of the studies of Bicen and Kocakoyun (2018) and Hung (2017). This emphasizes the fact that *Kahoot!*, which is the first SRS created to provide a gaming experience, benefited the principles of theory on intrinsic motivation (Malone, 1981). The theory holds that individuals participate in the activity because they perceive it as rewarding within itself, independent of external rewards (Keller & Bless, 2008). Some studies also indicated that *Kahoot!* has a positive effect on vocabulary knowledge (Huang, 2015; Guaqueta & Castro-Garces, 2018; Medina & Hurtado, 2017; Wichadee & Pattanapichet, 2018) and it motivates the students to be more active during the lessons by making the classroom environment more entertaining (Wang & Lieberoth, 2016). When the needs of the new generation are taken into consideration, it can be said that these effects of *Kahoot!* are necessary because the education system has evolved from the traditional methods for which books are enough to the modern methods which require keeping up with the latest technological advancements. In his study, Iwamoto et al. (2017) focused on the effectiveness of *Kahoot!* for test- preparation and found that *Kahoot!* made this preparation process easier. This result supports the findings of Nugroho and Nur (2018) who stated that *Kahoot!* is seen as a practical and usable response system that reduces teachers' workload and turns the classroom into an energetic and fun environment.

Unsurprisingly, there are of course some studies that pointed out the inefficacy of *Kahoot!*. such as Boden and Hart (2018). They stated that the noise that occurs while using *Kahoot!* because students' excitement can be accepted as a disadvantage of it. This is acceptable because nothing will serve as a good teaching material if the classroom is not managed well. Unnecessary and irrelevant talking causes the lesson to deviate from its main purpose. Another study that shares the negative sides of *Kahoot!* is Omar's (2017) study the results of which showed that the guidelines for evaluating the performances of

students are not clear enough to inform students about their progress and also it doesn't encourage interaction between students and teachers. These criticisms are understandable because when students do not have the necessary information about how they are evaluated at the end of their performances, they are likely to feel anxious and be afraid of making mistakes. Encouraging student-teacher and peer interaction are also necessary for language classes for creating an authentic environment. Motivation is key but authenticity shouldn't be neglected while trying to motivate students. This again shows that teachers have an important role as the leader of the class and they should well- arrange the frequency of these kinds of platforms.

Nevertheless, it is relatively proven that *Kahoot!* stands out among most other tools that are designed similarly although some slight disadvantages can be avoided by using the suitable methods of using it.

## 7. Conclusion

As technology develops, keeping pace with it has become a necessity for the field of education just like all others. During the adaptation process, the terms 'gamification' and 'game-based learning' have occurred and started to be heard more often each day. As the name suggests, game-based learning aims to turn classrooms into places where students can have fun while they are acquiring the target knowledge planned before. There are different game-based learning tools used in classroom environments. One of them that can be utilized is *Kahoot!*. It is a game-based learning application that can be used to make learning more enjoyable as well as motivating students to be active in class. In this article, the effects of *Kahoot!* on students and the teaching environment were examined by looking at the related study findings. It was seen that although a few studies suggest that it doesn't have an effect on the quality of the learning environment or criticize it because of limiting teacher and peer dialogue, most studies agree that *Kahoot!* has more advantages than disadvantages as it increases comprehension and motivation as well as it provides an engaging environment.

Bergin and Reilly (2005) state that according to some scholars, educational games are not high-class enough to be used in classrooms. However, the articles that are examined in the present study demonstrate that with the help and desire of the teachers, *Kahoot!* could be a great platform to create an active classroom. This study, gathering various former studies that are qualified, aims to provide synoptic information about the effects of *Kahoot!*. Despite the place that *Kahoot!* has in the literature, further research that implements *Kahoot!* in a more specific context needs to be conducted through various research designs.

## 8. Limitations and Suggestions for Further Research

One of the limitations that were observed was the limited time in class because the institutions generally focus on covering the course books and extra materials require extra time. Another limitation is that the effectiveness of the program is not only based on the technological innovation and the quality of digital equipment but also on the way the teacher organizes the learning place and the methods and techniques she prefers to use. Thus, *Kahoot!* can have limitations from a foreign language pedagogical perspective. If it is not used the way it must be or used more frequently than needed, it can reduce the motivation level of students and can be seen as a boring activity. For this reason, the frequency must be arranged accordingly and teachers should be careful about giving feedback to contribute to the learning process better as well as having clear objectives of the activities to get more reliable results.

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