New technologies and chemistry teaching: the use of kahoot as a support platform for teaching

Novas tecnologias e ensino de química: o uso do kahoot como plataforma de apoio ao ensino

DOI: 10.55905/oelv21n12-157

Recebimento dos originais: 11/11/2023
Aceitação para publicação: 11/12/2023

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ABSTRACT  
Kahoot is an application designed for polling and learning assessment. It introduces gamification-based learning into the classroom. This article, of a bibliographical and descriptive nature, intends to present the Kahoot application as a means of stimulating and engaging students in the teaching-learning process. It analyzes some implications of learning with a mobile device, in addition to highlighting the advantages of using Kahoot in the classroom.

Keywords: mobile technologies, apps, kahoot.

RESUMO  
Kahoot é um aplicativo projetado para pesquisa e avaliação de aprendizagem. Ele introduz na sala de aula o aprendizado baseado na gamificação. Este artigo, de natureza bibliográfica e descritiva, pretende apresentar o aplicativo Kahoot como meio de estimular e engajar os alunos no processo de ensino-aprendizagem. Ele analisa algumas implicações de aprender com um dispositivo móvel, além de destacar as vantagens de usar o Kahoot na sala de aula.

Palavras-chave: tecnologias móveis, aplicativos, kahoot.
INTRODUCTION

Globalization imposes many transformations on the world, especially in recent decades, as there has been a significant increase in the use of virtual and technological resources, which during the pandemic period in which we are inserted, opened up the importance of using new resources and pedagogical alternatives for teaching, which in general, arouse the attention of students during distance classes. Especially in this context of online classes, remote classes, etc. it is evident that, generally, the methodology used by the teacher is still very focused on an exclusively expository class tendency predominantly aimed at memorization (CACHAPUZ, et al., 2011; LIMA; LEITE, 2014).

Regarding the teaching of Chemistry, there is still a great difficulty in the learning process of this discipline, mainly because it demands a relatively more practical teaching, it brings the discussion to the precarious reality of schools in Brazil and it is observed that it is a factor of great relevance for this fact. Schnetzler (2002) states that Chemistry Teaching does not present a low level in the evaluation of education, however it is not following the development that occurs so quickly. In summary, the author states that the methodology takes place almost exclusively verbally, in which learning is understood as an artifice for accumulating knowledge.

Souza and Neiva (2018) point out that the teaching methods used today are basically the same as in the 19th century, so they sometimes become inadequate and lack innovation. This causes students to have less and less interest in carrying out the activities proposed by the teacher and less in learning what is taught in the classroom. Failure to develop the suggested exercises will make learning difficult and leave students with the wrong impression that the content of a given subject is difficult. The difficulty is in thinking of something that could make the execution of exercises simpler, interesting and pleasant for the students, also facilitating the access of the students to the exercises proposed by the teachers.

Research shows that efficient learning is done through the association of curricular contents and pedagogical strategies adjusted to the needs of each student, pointing out that the use of technologies has positive effects when incorporated into the pedagogical work, encouraging and providing opportunities for more active learning, because, through
the use of technology, students' self-esteem, self-confidence and motivation to learn are increased. (FERREIRA, 2002; LOCATELLI, 2018).

Kahoot is an online learning and teaching platform, which brings gamification elements to create questionnaires that can be used in business environments, classrooms and social environments. There is a range of ready-made questionnaires on the most diverse subjects that can be shared through this platform. In addition, Kahoot allows the creation of new questionnaires that can be private or public. Kahoot features features such as ranking and scoring or not, in 4 game modes.

The teacher can choose to carry out the online questionnaire in a competitive or non-competitive mode during the activities taught in the classroom, in addition, he can use Kahoot as an aid tool in carrying out activities in the classroom, fixing content and preparing a list of exercises for tests, in order to motivate students to study more and offering an alternative to the centralization of the elaboration of activities for study directed by the teacher, making it possible for the students themselves to ask their questions for study.

This research is a bibliographical survey about the use of the Kahoot platform and its contributions to the improvement of the teaching method using gamification elements, aiming to bring improvements to the classroom and provide a greater and better interaction between student/teacher and student/student through visual and technological resources enabling proximity to the subject of Chemistry even without experimental or laboratory classes.

2 THEORETICAL REFERENCE

The use of technology is increasingly present in everyday life through cell phones, computers and other devices that have become essential in our daily lives. Consequently, there was a significant growth in the use of electronic games, mainly among adolescents and young people, however, the increase in these technologies can have a negative effect on the school life of these users. Given this scenario, technological devices often divert students' attention and interest in classes. Hence arises the interest in the use of electronic
games as a teaching aid, seeking to bring motivation and attract the student's interest and commitment in their own learning process LOCATELLI, 2018).

When the use of games for educational purposes is disseminated, the motivational capacity of these games is usually the most important. However, educational games have the potential to go far beyond motivational factors, as they can help students to develop a series of skills and strategies, which is why they are starting to be considered very important teaching materials (GROS, 2003). Here are some of the benefits that digital games for education can bring to the teaching and learning process:

Motivation: Educational games have a strong ability to provide fun and entertainment to users, while providing a highly interactive and dynamic environment to stimulate learning (HSIAO, 2007). They provide users with curiosity, interaction, challenges and fantasies, which can stimulate student interest and motivation (BALASUBRAMANIAN; WILSON, 2006). The technology used in video games can provide a very rich visual and spatial aesthetic experience, in addition to the immersive experience in the game, it also has the ability to attract and lure players into a fictional world that can be awakened. Sensation of pleasure and adventure (MITCHELL; SAVILE-SMITH, 2004).

It is worth mentioning that the willingness and acceptance of learning with more relaxed students is usually greater, and it is possible to add elements of joy and fun to the learning process to achieve such results (PRENSKY, 2001; HSIAO, 2007). The desire to promote the development of new skills is achieved through a state of high concentration and enthusiasm. Well-crafted games can guide players to that state. (MITCHELL; SAVILL-SMITH, 2004).

Games provide a series of goals and challenges that need to be achieved and overcome, which inspire people's enthusiasm, keep them motivated and, in some cases, can revive the spirit of those who have lost interest in learning (RITCHIE; DODGE, 1992).

Facilitate learning: video games can facilitate learning in many areas of knowledge. They can also generate representations of various scenes and objects through graphical elements. For example, to help understand concepts that are difficult to
visualize and manipulate, such as cells, molecules, mathematical graphs, etc. (FABRICATORE, 2000; MITCHELL; SAVILL-SMITH, 2004).

Through the game, students are also placed in the role of decision makers and face more and more challenges to learn by trial and error. The designer's idea in the process of building the game is to insert the user into a learning environment. Right after increasing the complexity of the situation, as skills increase, the player's reaction becomes faster and the decision-making speed will be faster (MITCHELL; SAVILL-SMITH, 2004; KIRRIEMUIR; MCFARLANE, 2004).

A large number of teachers realize that, in addition to facilitating the acquisition of content, games also help to develop a series of strategies that are very important for the learning process, having the ability to remember, solve problems and reason. Other benefits of games and simulators include improving strategic thinking, developing calculation and analysis skills, and improving psychomotor skills (MCFARLANE; SPARROWHAWK; HEALD, 2002; MITCHELL; SAVILL-SMITH, 2004).

You can also practice teamwork, collaboration skills and formulate team strategies through some online teamwork games (GROS, 2003). The characteristics of educational games are defined as follows: “They must have teaching objectives, and their use must be based on the methodology of the instructional process, and promote the learning content through interaction, motivation and discovery” (PRIETO et al., 2005).

The use of digital tools in the classroom to promote motivation has been much studied, and one of the prominent and widely used tools is the Kahoot digital platform, which is used by students and teachers to create quizzes to test and promote student learning. The good results of this tool can be found in several studies, such as the study by Missagia et al. (2018); Plump and LaRosa (2017); Cassettari (2016); Licorish et al. (2017); between others.

There are several applications for Kahoot within the classroom, and it can be used in the presentation of works, tests of knowledge among students, fixation of content in class, questions for leveling knowledge, questions in lectures, among many others (SOUZA, NEIVA, 2018).
3 METHODOLOGY

This research was developed through bibliographic sources, such as books, dissertations and theses and parallel sources, such as the Internet, magazines and newspapers, based on current educational theories.

4 DEVELOPMENT

4.1 USE OF TECHNOLOGIES IN THE TEACHING-LEARNING PROCESS: LIMITS AND POSSIBILITIES

Human learning is seen as a continuous process of transformation, in which educators act as collaborators in human development. (FERREIRA, 2007). Braga (2001) believes that in this process of discovery, observation and exploration, that is, learning, people can point out a powerful weapon to support this process, help teachers and educational psychologists and improve school teaching.

Its purpose should be to seek the evolution of education, as it allows the exploration and construction of knowledge, provides students with an immersive and interactive knowledge experience, and helps to ensure that information is fully acquired and properly absorbed. (BRAGA, 2001). Research shows that efficient learning is done through the association of curricular contents and pedagogical strategies adjusted to the needs of each student, pointing out that the use of technologies has positive effects when incorporated into the pedagogical work, encouraging and providing opportunities for more active learning, because, through the use of technology, students' self-esteem, self-confidence and motivation to learn are increased (FERREIRA, 2002).

According to Locatelli (2018), it is clear that teachers in the technological age face the challenge of changing the way they educate and communicate with students. It is necessary to invent a new model, because we are in a new era of knowledge that will guide us. to dissemination. Most educators realized that effective learning cannot be achieved without student participation. Education is not only about delivering content, but also a wider range of actions that occur through student / teacher interaction, which develops the training of cognitive, emotional skills and social factors that the student will carry throughout his life (SILVA, 2001).
Even with this information, teachers still face the imminent difficulty of changing the teaching model, classrooms are still generalized, the low oral participation of students and the development of individual activities discourage them and make it difficult to build learning. (SILVA, 2001; LOCATELLI, 2018).

The increased use of technology has restricted teachers because it is necessary to insert education in this new technological world, as professionals who refuse to use this tool for teaching will run the risk of being eliminated by the job market. The computer is seen as a new revolution in the educational system. However, much research is still needed to recognize the impact of technology on teaching, point out the positive and/or negative aspects of the educational system and provide subsidies for the development of educational programs that can be used as didactic resources (COSCARELLI, 2002).

4.2 KAHOOT APP DEFINITION

Kahoot is a platform application available on the Internet that allows the creation of educational and gamification activities to do multiple-choice exercises, sequencing, open questions and live quizzes in the classroom. For Wang (2015, p. 221), Kahoot! This is a student reaction based game that can temporarily turn the classroom into a game show. The teacher plays the role of host of the game and the students are the competitors. The teacher's computer is connected to a large screen to display possible questions and answers, and students can provide answers as quickly and accurately as possible on their digital devices.

The app can be accessed at https://getkahoot.com/, where users can register to create questions and activities, and students can also access teacher-created activities. Kahoot can be accessed from any device with an internet connection. In this sense, teachers will be able to promote activities in computer labs and classrooms. If students have mobile devices (phones, tablets, laptops) and Internet access, they can cooperate with BYOND (bring your on device) in the classroom, and teachers can optimize their courses using students' own devices (LOCATELLI, 2018).

To use the app for courses, teachers must first own the tool. Therefore, the first step is to create your account, which can be registered in Kahoot itself and requires only
basic data such as name, email and password. After creating an account in the environment, the teacher must select the type of activity he intends to design. Among the options, we have: Quiz: creates multiple choice questions, each question has a timer, and each answer has a score (very suitable for indoor games);

Jumble: set of ordering questions, where students must hit the correct order in each of the questions prepared by the teacher; Discussion: for conducting debates and open questions; Survey: for asking questions with a timer, without assigning a score to the answers given by the students (learning verification only). The most frequent activities in Kahoot are Quiz and Jumble, as they allow students to score if they answer correctly and quickly, creating a kind of game in the classroom.

According to Costa & Oliveira (2015), teachers can use Kahoot! In many ways it depends on your educational goals. This is a great discussion tool, and students can vote anonymously on ethical issues. It is also a tool for summarizing topics in a fun, interactive and engaging way.

Another way to use Kahoot! is that, based on its use, students' understanding of the content of the classroom can be investigated. In the logic of the application, the question is projected on the blackboard, and students only receive the answer options on the cell phone / tablet screen through the corresponding symbols. This strategy is intentional so that students can focus on what happened during the question and use the device only to give the selected answer. When all participants have answered or the time limit for each question ends, the application will send the correct answer option on the student's cell phone screen in real time.

4.3 STUDIES WITH KAHOOT IN EDUCATION

Although it has been around since 2013, Kahoot still has very little research published on the internet. In Portuguese, this number is even lower, as many teachers do not know the tool, which makes it rarely used in the classroom. However, some successful cases of the use of this application in education are presented.

The authors Salvino and Onofre (2015) present the experience of using Kahoot in an educational environment, where a group of high school students use the tool for two
different purposes: reviewing what they have learned and evaluating student learning. The author used three questionnaires in Kahoot, the first of which had the sole objective of showing the tool (with simple questions of general knowledge), the second and third were more complex and the questions were related to the content of the work.

In order to collect data related to the experience, a questionnaire was used that contained questions related to performance and feelings related to the use of resources. After the experience, the author reported that in addition to changes in attitudes, positive changes in behavior levels, increased attention in the classroom and the desire to answer questions correctly can also be observed in students that are linked to awakening to new possibilities of learning, use of technologies in the classroom.

Santos, Guimarães and Carvalho (2014) carried out an experiment using the Kahoot application in an inverted classroom environment. In mathematics, a class of 17 8th grade students conducted content on geometric entities. For data collection, the author used the questionnaire on Google Drive, as well as on-the-spot notes and audiovisual records about the implementation experience.

Throughout the research process, in addition to Kahoot, other tools were used, such as Podcast and Gosoapbox. However, Kahoot is the app of choice for students because they find the tool allows them to compete, especially as it is a faster way to answer questions. From the author’s point of view, in addition to healthy competition, immediate feedback on learning progress and allies in classroom games, Kahoot also offers greater flexibility in assessment.

4.4 ADVANTAGES OF USING KAHOOT IN EDUCATION

According to Wang (2015) and Guimarães (2015), Kahoot can promote the development of various skills and provide advantages and opportunities for teachers, namely:

a) Technology, students become more curious and engaged. These stimuli can be transformed into learning motivation, as the use of applications creates a healthy competitive environment for the pursuit of learning;
b) Improved reasoning: For students who answer faster and more correctly, test scores are different (higher). Therefore, it requires quick thinking to maintain the best conditions;

c) Improve class concentration: When teachers communicate to students that they will use Kahoot to assess their learning at the end of the class, students tend to pay more attention to the content as they need to appropriate the information shared during the class in order to participate in a meaningful way. more active and qualitative at the time of the game;

d) Allow role switching: Teachers can ask students to prepare multiple choice questions for Kahoot individually or in groups. This allows learning to develop in a different way, as they leave the student's place and become “teachers”, as they need to consider issues to be implemented for other students;

e) Collaborative work: Kahoot allows teachers to use the questionnaire individually or collectively. That is, if you play in the classroom, not all elements have mobile devices. Teachers can create working groups to complicate the problem and increase response time. Therefore, students will have more time to answer each question; f) Use ICT in the classroom: There are many critics to the introduction of mobile technology in the classroom, but by using Kahoot, we managed to prove that the cell phone can become a positive form of integration;

g) Real-time learning assessment: varying assessment techniques can become a way of including students' various skills (speaking, writing, interpreting, drawing, pointing, etc.).

Kahoot, when used as an evaluation tool, can favor both students, as they may feel more excited about this modality, and facilitate the teacher's activity, since, at the end of the questions, he obtains an electronic report with the grades of each student, as well as the overall performance of the class. This allows feedback on the teaching and learning process and immediate intervention on the class or group of students who have obtained unsatisfactory results.

In addition to the possibilities mentioned above, Kahoot can also be converted into an inclusion tool, as it allows the insertion of images, videos and sounds at the
question location. If the teacher has students in the class with some limitation, whether visual or auditory, he can choose one of these resources, in order to include all students in the quiz.

5 FINAL CONSIDERATIONS

As can be seen throughout the study, the use of mobile devices is becoming a very good educational possibility. However, if the human factor, that is, the teacher, does not participate in the process and does not reflect on the strategies and methods of integrating these resources into their contents, technology alone cannot solve educational problems.

Teachers have acquired new ways of bringing knowledge to students, placing them more at the center of the process, ensuring that they develop autonomy and teamwork skills and integrating information and communication technology resources into the learning process. It is noteworthy that the use of mobile devices and any other technology involves a certain amount of initial work, but in the long run, this is a gain for the teacher, as he will be able to reuse these experiences in future courses.

The experience of using more positive methods is always more important and the result is recognized by the students. Schools are increasingly equipped with modern resources, and it is up to teachers to find alternatives to integrate the classroom into this reality. As we have seen, the experience is rich and the results promising. Kahoot has incredible potential, it only requires the teacher's creativity to prepare interesting questions and establish innovative exploration methods and rules.

In response to the questions raised at the beginning of this article, such as whether Kahoot can be an educational tool, we think yes, as according to the content mentioned in this article, some experiments have been carried out to test at different educational levels, and there are enough plans and associated with the content. Through this app, you can increase students' interest in learning and improve pedagogical practice.

With regard to the educational experience, it is observed that most of the reference works come from the United States and Europe, which puts Portuguese-speaking countries at a disadvantage in terms of the theoretical and empirical contribution of the tool. For tips on how to use this app for future research, investigating collaborative work
in classrooms where students have few mobile devices or computer labs with few machines, and using the app as a problem-solving environment, encouraging students to create and evaluate other creativity and intelligence courses.
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