



# **The Effectiveness of Kahoot on Technical Vocabulary Learning and Motivation of Engineering Students**

**Dr. Shaimaa Salah El- Din Afify**

Department of Curriculum and Instruction, Faculty of  
Graduate Studies for Education, Cairo University

**Dr. Eman Mohammed Fathy Abd El Latif**

Department of Curriculum and Instruction, Faculty of  
Graduate Studies for Education, Cairo University

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Shaimaa Salah El- Din Afify<sup>1</sup>, Eman Mohammed Fathy Abd El  
Latif<sup>2</sup>

<sup>1</sup>Department of Curriculum and Instruction, Faculty of Graduate  
Studies for Education, Cairo University  
Email: [Shaimaa\\_salah12@yahoo.com](mailto:Shaimaa_salah12@yahoo.com)

<sup>2</sup>Department of Curriculum and Instruction, Faculty of Graduate  
Studies for Education, Cairo University  
Email: [eman-gna@hotmail.com](mailto:eman-gna@hotmail.com)

### Abstract :

The main purpose of this research is to investigate the effectiveness of on-line game Kahoot on technical vocabulary learning and motivation among preparatory year engineering students. To achieve the purpose of the study, a pre- post-test was constructed to measure students' level in technical vocabulary learning and a questionnaire to measure the students' motivation towards learning technical vocabulary. The participants of the study, totaling 60 divided into two groups (experimental and control), were selected from AL Salam Higher Institute for Engineering and Technology during the second semester of the academic year 2019/2020. Both the control group and experimental group received their lectures online. In addition, the experimental group used the on –line game Kahoot to do extra quizzes on technical vocabulary. Independent T. test was used to analyze the results of the study. The findings of the study indicated that there were statistically significant differences in the post- test and post questionnaire between the control and the experimental groups in favor of the experimental group. In addition, there were statistically significant differences between the results of the pre- and post-test and questionnaire of the experimental group in favor of posttest and questionnaire. These findings revealed that the on-line game Kahoot had a positive effectiveness on the students' technical vocabulary learning and their motivation towards learning technical vocabulary.

*Key words:* Kahoot, Technical vocabulary acquisition, Motivation

## فعالية كاهوت في تعلم المفردات التقنية والدافعية لدى طلاب الهندسة

شيماء صلاح الدين عفيفي<sup>1</sup>، إيمان محمد فتحي عبد اللطيف<sup>2</sup>

قسم المناهج وطرق التدريس، كلية الدراسات العليا للتربية، جامعة القاهرة

<sup>1</sup> البريد الإلكتروني: [Shaimaa\\_salah12@yahoo.com](mailto:Shaimaa_salah12@yahoo.com)

<sup>2</sup> البريد الإلكتروني: [eman-gna@hotmail.com](mailto:eman-gna@hotmail.com)

### الملخص

الغرض الرئيسي من هذا البحث هو دراسة فعالية كاهوت (Kahoot) على تعلم المفردات التقنية والدافعية بين طلاب الهندسة في السنة التحضيرية. ولتحقيق الغرض من الدراسة، تم إعداد اختبار قبلي-بعدي لقياس مستوى الطلاب في تعلم المفردات التقنية واستبيان لقياس دوافع الطلاب نحو تعلم المفردات التقنية. وقد تم اختيار المشاركين في الدراسة، البالغ عددهم 60 طالبا موزعين على مجموعتين (تجريبية وضابطة)، الملتحقين بمعهد السلام العالي للهندسة والتكنولوجيا خلال الفصل الدراسي الثاني من العام الدراسي 2020/2019. تلقى كل من المجموعة الضابطة والمجموعة التجريبية محاضراتهم عبر الإنترنت. وبالإضافة إلى ذلك، استخدمت المجموعة التجريبية اختبارات تدريبيه من خلال (Kahoot) كاهوت على المفردات التقنية. تم استخدام اختبار (ت) لتحليل نتائج الدراسة. وأشارت نتائج الدراسة إلى وجود فروق ذات دلالة إحصائية في الاختبار البعدي والاستبيان البعدي بين المجموعة الضابطة والمجموعة التجريبية لصالح المجموعة التجريبية. وبالإضافة إلى ذلك، كانت هناك فروق ذات دلالة إحصائية بين نتائج الاختبار القبلي والبعدي والاستبيان القبلي والبعدي الخاص بالمجموعة التجريبية لصالح الاختبار والاستبيان البعدي. وأوضحت هذه النتائج الأثر الإيجابي لكاهوت (Kahoot) على الطلاب في تعلم المفردات التقنية ودوافعهم نحو تعلم هذه المفردات.

الكلمات المفتاحية: كاهوت Kahoot، تعلم المفردات التقنية، الدافعية

## Introduction

Consistent with the increasing demand of learning English as an international language used all over the world, teaching English for specific purposes (ESP) has a growing interest due to its impact over the future of the learners. Students are expected to engage with the content taught in the courses, which means they have to not only process large amounts of specialized discourse, but also articulate their ideas following the conventions established in the engineering discipline. This, in turn, highlights the need for specialized language instruction that can meet the needs of students majoring in engineering (Nekrasova,2019).

The challenges of the present-day globalized world have led to significant changes in the academic curricula at universities. In the last several decades, there has been a shift from general to specialized paradigms in English language teaching (Terauchi, H., Noguchi, J., &Tajino, A., 2019). Achieving language proficiency for learners in technical institutions is not a luxury; it is a must in their workplaces in the future. Mastering English language specialized and technical terms is considered to be main pillar in their professional development across their whole career. It gives them the opportunity to be updated and aware of modern trends in their work and be able to communicate with different culture in a meaningful way. In the field of engineering, the ESP courses prepare engineering students to be able to read specialized texts, comprehend lectures and tutorials in English, and freely express themselves in discussions on engineering topics (Irudayasamyet al,2020). This in turn highlights the need to understand the challenges and the effective strategies for teaching ESP.

## Background of the problem

Despite the significance of English language, engineering students show a general lack of concern regarding the significance English has for their future careers, and there are several reasons behind this lack of motivation and interest. Some students fail to realize that proficiency in English is a competitive advantage in today's globalized work market. Therefore, students are unable to effectively create links between the knowledge acquired in class and real-life experiences, events and requirements (Irudayasamy et al,2020).

One of the main challenges associated with teaching English for engineering students is acquiring technical-specific vocabulary and how it is used contextually. Since developing English language proficiency depends to great extent on engineering student's ability of the acquisition and retention of technical vocabulary and their ability to convey meaning in communication, building vocabulary knowledge

is pivotal in achieving progress over spoken and written language. The overarching goal of ESP instruction is to help specialist learners' function well in workplaces or vocational higher education settings where English serves as a medium of communication (Irudayasamy et al,2020). Hence, Wanpen et al (2013) point out that technical vocabulary may be enormous and cannot be neglected in ESP learning.

### **Features of Technical Vocabulary**

In content areas such as engineering, students are regularly confronted with new technical vocabulary terms. Technical vocabulary can be considered key element in teaching ESP. Therefore, experts try to identify the main properties of technical vocabulary to minimize the overlap between general vocabulary and technical one.

In this sense, Nation (2013) classifies vocabulary into three groups according to the frequency of words in modern texts: High frequency words, mid frequency words, and low frequency words. He also identifies two kinds of specialized vocabulary: technical vocabulary and academic vocabulary. Technical vocabulary is a collection of words that are used more frequently in one specialized discipline rather than in other areas (Chung & Nation, 2003). So, technical vocabulary is closely associated with learners who have a specific purpose in language learning (Chung & Nation,2004). It can be an ordinary word which provides a specialized meaning that differs from its common meaning when used in a specific field (Wasuntarasophit ,2008). Dudley-Evans and St John (1998) suggest two distinct categories of ESP vocabulary. The first issemi-technical vocabulary, which is used in general language but has a higher frequency of occurrence in specific and technical descriptions and discussions. The second is technical vocabulary, which has specialized and restricted meanings in certain disciplines and which may vary in meaning across disciplines.

Recently, Zahran (2017) summarizes the main features of ESP vocabulary as follows. Firstly, as less frequently used in everyday situations, ESP vocabulary is learnt for specific uses related to technical or academic needs in a particular topic, field or discipline. Secondly, ESP vocabulary involves a great many of abstract words. Thirdly, ESP vocabulary is designed around students' needs based on their field of study. Therefore, it is crucial to specify the appropriate technical vocabulary that should be introduced and practiced and the appropriate methods and activities to meet learners' needs.

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## Implementing Technology in Teaching Technical Vocabulary

Confronting the challenge of involving engineering students in learning new technical vocabulary needs searching for different pedagogical practices to traditional classrooms. Hence, digital learning in this context, mobile devices can be considered as a considerable medium for implementing technical vocabulary which is hard to be conveyed through traditional techniques. Over the past few years, there has been an escalation in adapting innovative teaching methodologies in higher education sector. Recent advancements in technology and usage of smart devices unlocked various opportunities for educators to implement student-centered teaching and learning strategies (Babak and Hamideh, 2016).

Engineering students may have difficulty in understanding new words without repeated exposure to those words in addition they need visual materials to understand the exact meaning of these vocabulary as using their first language to illustrate the meaning is not enough to convey the meaning. Therefore, utilizing online application seems to be very helpful in this concern. Grimley et al. (2011) point out that the majority of students have been raised in a technological era and it is reasonable to assume that they will thrive in a similar environment. Among these learning applications is Kahoot which stands as a free online software becoming in a common tool for teachers in recent years (Wang and Lieberoth, 2016).

The online gaming tool chosen for this study is Kahoot. Wang, Zhu and Saetre (2016) point out that Kahoot! represents a new generation of student response systems that focuses on student motivation and engagement through gamification. Hence, it is a simple tool which allows integrate gamification components such as the management of scores, the leader-board and provides an instant feedback to students (Iruela& Neira,2018). This tool allows teachers to create online quizzes which students can play and compete against each other. The students can join the game using the game pin which is displayed at the beginning of the game. The teacher can set the time from 5 to 120 seconds for each question depending on the level of difficulty. Points are allocated based on accuracy and speed. The scoreboard displays who is leading at the end of the question and the top three scorers are displayed at the end of each game (Nkhoma et al ,2018).

The platform enables teacher-learner interaction in classroom settings of various sizes via competitive knowledge games using existing infrastructure. The embedded graphical interfaces and audio elements present a gaming experience that can potentially promote



motivation and learning among students, including adult ones (Tan et al, 2018). To meet this objective, Kahoot! offers a tool that not only engages students, but also be used to assess students learning and engagement.

Kahoot application can be helpful in learning technical vocabulary because the quiz feature in Kahoot contains multiple choices available in four choices. Quizzes are not only in the form of written questions but can be inserted images, videos, and songs to support the thinking power in understanding the quiz (Puyada et al.2018). Therefore, it can be said that Kahoot! is a combination of using audience responses, role-plays and, using video and audiovisual aids.

With the escalating intervention of technology in education, evaluating the effectiveness of various applications on learning language has become main interest for language experts. Therefore, using applications in language learning has raised debate among language experts. Consequently, different studies try to explore the impact of using Kahoot as one of multiple applications which wide spread by learners over language skills acquisitions. Abrams and Walsh (2014) suggest that students may enjoy leaning vocabulary through gamification because online games tend to flow better than traditional textbook methods, and tend to have a predictable sequence of play as well as real time feedback.

In line with this context, a recent study regarding Kahoot was conducted by Al Manar et al. (2019) to investigate whether the students' interest in using technology could be used to improve students' learning performance. It was found by the researcher from the interview that the students mostly had difficulties in memorizing and using vocabulary in their daily conversation. As a result, the students mostly reviewed the vocabulary by memorizing, remembering and creating sentences but none of them used vocabulary in their daily conversation. The participants were twenty-five students of UMT Indonesia. The results indicated that using Kahoot! had positive effect on learning vocabulary. Moreover, technology had a significant impact on the students' learning motivation as they mostly experienced the joy of learning using technology.

In a more recent study, Sartini (2020) used two cycles of Kahoot usage, pre-action Kahoot to identify the use of Kahoot as a vocabulary drills in order to support oral reproduction skills in the evaluation of early learning. The post action Kahoot was used to find out the improvement in learning outcomes using the quiz. Each cycle contained stages of planning, acting, observing, and reflecting. By the increasing score in the use of Kahoot, vocabulary mastery and oral

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reproduction skills were assumed to increase. Those as research subjects were cadets of the Nautical Science program in 2018/2019 with total numbers of 21 people. From the results of the two Kahoot quiz cycles, it could be seen that the Kahoot quiz turns out to have a significant influence in the vocabularies and terminologies mastery of Maritime English context.

Exploring the use of the online platform Kahoot! as a tool for teaching and learning vocabulary was the purpose of Lierena& Rodríguez 's (2017) study. A quasi-experimental design process was developed throughout a period of time to see how helpful this tool is in the learning vocabulary process in English Language classroom. The results supported previous studies which found that using IRS improved learners' engagement and interaction. They also provided further evidence that the use of Kahoot! increased motivation and improved acquisition of vocabulary for later exams. The results of the students' satisfaction survey indicated that students enjoyed playing Kahoot! finding it easy to use.

In context of vocational education, there is a growing need to equip learners with accepted language level. To cater this need teachers should develop their programs. In response to this need, Chachra et al (2019) proposed Kahoot as a formative assessment tool in undergraduate engineering education. The study was carried out on third year Computer Engineering students. The study employed a Quiz followed by a Feedback Survey created through the Kahoot platform. The Quiz was based on Software Engineering Course. A total of 28 students participated in the study. The Survey showed that Kahoot enhanced classroom engagement and promoted active learning. The students found that Kahoot was an effective and engaging tool which made learning and competing with each other fun.

Another research project was conducted at the Norwegian University of Science and Technology (NTNU) by Wang et al. (2016) to investigate the effect of a traditional non-gamified response system (Clickers), a game-based response system (Kahoot!) and paper-form formative assessment for a quiz in lectures. The results were significantly inclined towards the use of Kahoot! Students were found to be more motivated by Kahoot! as compared to clickers and the paper-form quiz.

### **Motivation**

Affective factors are essential in language learning as they can promote or hinder language progress. Basically, motivation is one of these factors which can be considered as main pillar in teaching ESP. The relationship between motivation and foreign language learning has



been extensively investigated. Different models in the literature have addressed this issue, motivation is widely acknowledged as a significant factor in L2 learning (Gardner, 1985; Gardner & Lambert, 1972). Two theories regarding learner motivation for second-language acquisition were developed: Gardner's motivation theory (1972) and Deci and Ryan's self-determination theory (1985-1995).

According to Gardner (2001), motivation includes three parts: effort, desire, and positive effect toward learning the language. Motivation is divided into two basic types: integrative and instrumental. Integrative motivation is characterized by the learner's positive attitudes towards the target language group and the desire to integrate into the target language community. Instrumental motivation underlies the goal to gain some social or economic reward through L2 achievement, thus referring to a more functional reason for language learning (Gardner, 1982). While Deci and Ryan (1985, 1995) define individual motivation as the degree of autonomy that individuals exhibit during learning activity, and subdivide it into two motivational orientations. Intrinsic motivation refers to doing something because satisfaction is inherent in the process, while extrinsic motivation refers to doing something in order to attain outcomes external to it.

Vallerand et al. (1992) further subdivide intrinsic motivation into intrinsic motivation-knowledge, in which the learner's pleasure or satisfaction is derived from exploring or understanding new information; intrinsic motivation-accomplishment, based on the achievement of specific learning goals; and intrinsic motivation-stimulation, associated with sensations derived from learning activities, including what might be described as a 'mental buzz'. For Deci and Ryan (1985), extrinsic motivation also has three subtypes, along a continuum based on the degree of autonomy. External regulation is its least autonomous form, with learning regulated through external rewards or punishments. Introjected regulation refers to a middle ground in which learning behaviours are internalized by the individual to some degree, but fall short of being truly or fully self-determined. Lastly, identified regulation refers to the internalization of a person's extrinsic motivation through their identification of the importance or value of the learning tasks.

### **Motivation and vocabulary**

Different studies provided evidence that motivation is a key to success in language achievement. Hence, it is logical to assume that motivation also facilitates vocabulary learning. Central to understanding students' behaviours and emotions in vocabulary

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learning activities, students' motivation is a necessary step toward identifying the factors that affect students' behaviours and emotion in vocabulary learning. Motivation is what activates behaviour and helps individuals persist in given tasks (Guthrie & Wigfield, 2000). Tseng and Schmitt (2008) believe that motivation should be perceived as a dynamic factor comprising a number of stages, and that each of these stages will affect in different ways the process of vocabulary acquisition, which is also dynamic. Different studies have revealed that there were significant and positive direct and indirect effects of motivation on vocabulary learning (Deng, 2010; Sadeghi, 2013; Sarani & Shirzaei, 2016; Albodakh & Cinkera, 2017 & Zhang, Line, Zhang & Chai, 2017). Dörnyei (1990) and Gardner & MacIntyre (1991) demonstrate that both integrative motivation and instrumental motivation can facilitate vocabulary learning so, they should receive special attention. Oxford (1996) considers that EFL environments differ from the ESL situation and recommended that instrumental motivation should be a main focus for research in EFL contexts.

### **Motivation and Kahoot**

Application of games for educational purposes aimed to increase students' motivation, which is an important, pervasive determinant of learning behaviour (Schunk, Meece, & Pintrich, 2013). That is, a game-based learning context helps to shape a higher level of motivation of an individual (Ebrahimzadeh & Alavi, 2017). Games have a significant role to play to change a traditional teacher-centered classroom to learner centered classroom. Kahoot has become a well-known online game used by instructors as an intriguing tool to check learners' knowledge and increase their involvement in learning. Kahoot adopts gamification as a way to motivate and involve learner. It can increase students' enthusiasm and motivation to learn. When students' motivation to learn increases, they are more likely to come to class. This concept is supported by Dörnyei and Ushioda (2011), who found that motivation is closely related to participation. In addition, digital games can create a good learning environment and promote user engagement (Goehle, 2013). According to Reeve (2012), engagement refers to the degree to which a learner exhibits his/her dynamic participation, attentiveness, enthusiasm when he/she becomes involved in the process of learning, which can contribute to satisfying learning performance. On the other hand, lack of engagement can hinder the effectiveness of learning (Heaslip, Donovan, & Cullen, 2014). In conclusion, digital games can be used as an effective tool to motivate learners, enhance their enthusiasm, increase and check their comprehension (Kim, 2015; Simões, Diaz Redondo, & Fernández Vilas, 2013).

There are number of studies investigated the effect of Kahoot on motivation. Licorish et al (2017) explored students' views about Kahoot! 's influence on classroom dynamics, motivation and the learning process. Overall findings revealed that the deployment of Kahoot! enriched the quality of student learning in the classroom, with the highest influence reported on classroom dynamics, engagement, motivation and improved learning experience. Tan, Singh, and Ganapathy (2018) conducted their study at Putra Malaysia University. This study examined the efficacy of Kahoot in terms of its ability to enhance motivation as well as involvement and to cultivate / reinforce learning (for both theoretical and practical purposes). The participants in this study were 51 students of English Department. The finding showed that the Survey data, overall, indicated that the students found Kahoot was a beneficial tool that could promote both engagement and learning motivation. Thereupon, it was strongly suggested that Kahoot could be implemented in the teaching and learning process in engineering course to acquiring technical vocabulary. Additionally, it was suggested that Kahoot contributed to promote their motivation. These results were consistent with the findings of Piskorz (2016), Wichadee & Pattanapichet (2018) and Benhadj et al (2019).

### **Statement of the problem**

The problem of the present study can be stated in the weakness of the preparatory year engineering students' technical vocabulary learning. During the researcher working at Al Salam Higher Institute for Engineering and Technology, it was noticed that the marks of the learners in English tests were low. This may due to the difficulty of technical vocabulary terms and their low motivation towards learning these terms. So, the researcher conducted a pilot study in November 2019. The pilot study aimed at investigating students' knowledge of technical vocabulary. The findings pointed out that there was weakness in students' technical vocabulary learning. In light of the findings of the pilot study, the researchers intended to investigate the effectiveness of using the online game Kahoot! On improving the students' technical vocabulary learning and their motivation.

### **The Purpose of the Study**

The main purpose of this study was to investigate the effectiveness of using the online game Kahoot! on technical vocabulary learning and motivation for preparatory engineering students.

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## Hypotheses of the Study

The following hypotheses have been formulated:

1. There is statistically difference between the mean scores attained by the experimental group and control group in the post-test of technical vocabulary learning in favor of experimental group.
2. There is statistically difference between the mean scores attained by the experimental group in the pre and post-test of technical vocabulary learning in favor of post-test.
3. There is statistically difference between the mean scores attained by the experimental group and control group in the post- motivation questionnaire in favor of experimental group.
4. There is statistically difference between the mean scores attained by the experimental group in the pre- and post-motivation questionnaire in favor of post-questionnaire.

## Definitions of Terms

### Technical vocabulary

Technical vocabulary is a collection of words that are used more frequently in one specialized discipline rather than in other areas (Chung & Nation, 2003).

In this study technical vocabulary refers to a collection of words with specialized meaning in engineering discipline and more related to engineering texts of the preparatory year of engineering students.

### Kahoot

Kahoot! is a free platform which provides teachers with the opportunity to: 1) create their own quizzes and surveys, or 2) use existing quizzes and surveys made accessible for public use. Scores are displayed at the end of each game and teachers are able to save the information in a digital document. (Tan et al,2018).

In this research Kahoot! is a free online application that presents quizzes designed by the researchers to help students to learn technical vocabulary.

### Motivation

Gardner (1985) defined motivation as the combination of effort and desire to achieve the goal of learning as well as favorable attitudes towards learning the language.



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In this research motivation is indication of students' satisfaction and engagement in learning technical vocabulary which has positive effect on their learning outcomes.

### **Significance of the study**

- This study may provide ESP learners with a new application that may develop their language learning.
- The study may encourage other researchers to conduct further researches on using technology to develop vocational vocabulary and different language skills.
- The study also pays educators' attention towards the importance of using technology to increase learners' achievement and motivation in learning language.

### **Method of the study**

The quasi-experimental approach was used in this study to compare between two groups chosen purposefully, they were categorized into experimental group (students used zoom program and Kahoot platform) and control group (students used zoom program only). The data were collected by using pre-posttest designed by the researchers. This test investigated engineering students' learning of technical vocabulary based on ESP series called Flash on English for Mechanics, Electronics and Technical assistance by Sabrina Sopranzi (2012). A pre- post motivation questionnaire was designed by the researchers to measure the students' motivation towards learning technical vocabulary.

### **Participants of the study**

The participants of this study were engineering students enrolled in preparatory year at Al Salam Higher Institute for Engineering and Technology. The study was conducted during the second term of the school year (2019-2020). All the sessions of the treatment were conducted on the smart phones of the participants and the researchers. Sixty students participated in this study. They were assigned into an experimental group that received the training program based on zoom and the on-line game Kahoot (N = 30) while the control group used zoom program only (N = 30).

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## **Instruments of the study**

Two instruments were used to collect data in this study, pre –post technical vocabulary test and pre- post questionnaire to measure students' motivation.

### **The Pre-post technical Vocabulary test**

The main aim of this test was to measure students' technical vocabulary level before and after the treatment. To design this test some questions were adapted from students' book Flash on English for Mechanics, Electronics and Technical assistance by Sabrina Sopranzi (2012) and additional questions were designed by the researchers based on the same book. The students were given time limit to answer the questions of the test (one minute per question). The total time was twenty minutes. The total mark of the test was twenty. It was divided into ten multiple choice questions and ten true or false ones. One mark was devoted to every single question. The vocabulary chosen for the treatment and the test depended on the course 's objectives and was derived from the glossary part at the end of every unit. This glossary contained the key technical vocabulary which the students should learn at the end of the unit. It was noticed that every unit in the book tackled different topic. Therefore, it had unique technical vocabulary according to the content.

### **Pre-post motivation questionnaire**

This questionnaire was designed to measure students' level of motivation towards learning new technical vocabulary. It was consisted of fifteen items based on Likert scale in which opinions were graded {strongly agree (1), agree (2), no idea (3), disagree (4) and strongly disagree (5)}. The items covered certain points related to the feelings of happiness, anxiety and the perception of the importance of technical vocabulary of the participants. There was no limited time to answer the questionnaire. The questionnaire was written in English language. The simplicity and clearness of the items were taken into consideration however, the researchers clarified and translated some items to some participants who asked for help.

### **Validity of the Instruments**

The instruments were submitted to a panel of jury specialized in the field of EFL curriculum and methods of teaching to have their viewpoints. Jurors suggested some changes and recommendations which were all considered. The main suggestion for the test was to focus on the definitions of the technical terms because the meaning of these terms was the main challenge for these learners and to change some words which were not clear. According to the questionnaire, the



main suggestion was to increase the negative items and delete the repeated items or the items which had the same meaning. In the light of the comments and corrections, modifications were done by the researchers.

### **Reliability of the instruments**

The instruments were piloted on a sample of (30) preparatory engineering students. The data collected from the pilot test was analyzed by using Statistical Package for Social Science (SPSS). A correlation between their scores of vocabulary test was calculated and it was (0.776) which indicated that the test scores were stable. Also, the questionnaire statistical analysis revealed that Alpha Cranch is (0.8) which proved statistical reliability. These results indicated that the instruments were reliable and could be used in the study

### **Procedures of the Study**

This study was carried out from February 2020 to May 2020, once a week for 10 sessions. First of all, a pre-test including a total of 20 questions was prepared in line with the 12 units of the ESP book. It was administered to both the control and experimental groups. The pre-test included multiple-choice and true/ false questions. The results of the pretest indicated that both groups were equivalent. The researcher used zoom live meeting to implement the online program to both groups. Each session lasted for 30 minutes. In each session the researcher explained different tasks in their books. So, the students would know the meaning of the target terms and the correct pronunciation of these terms besides identifying root words and affixes, collocations, antonyms and synonyms and technical abbreviations and acronyms.

Students in the experimental class only were required to download Kahoot! application. Kahoot! provided instructors with the detailed report of the overall performance of the students for each week and test. This involved percentages of the total correct and incorrect answers, feedback of the students in a Likert style, and individual analysis of each participant's correct and incorrect answers as well as their answer time in seconds. All students had smart phones equipped to work with this program. Following the same procedures in experimental class in each week, students were provided with the pin number that allowed them to join the game.

Users were free to choose their own nicknames in using Kahoot! However, the students were instructed to log in with their own names in order to specify the points of each student and declare the winner of

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the day. They chose answers by clicking on the colorful figures on their smart phones' screen. After each question, students could see whether they answered right or wrong on their devices. Students were also scored according to the time they provided the answer, in that the faster correct responses received higher scores. The program also provided a list of the students according to their scores after each question on the screen, which made them more enthusiastic about the next question. The questions were supported with pictures. As each item was presented, the program provided stimulating music and colorful animated shapes to keep participants engaged in the activity. A timer for each question created mild competition during the game.

The researcher provided the experimental group with the link of Kahoot game as assignments that could be accessed at any time. The researchers set up Kahoot as a self-paced challenge and assigned it to the students as homework to be done on their own time. The training sessions were delivered both asynchronously as the researchers used zoom live meetings and synchronous as the game was freely available within a whole week for participants to do them. These activities through Kahoot helped students to be autonomous and self-directed. The activities were presented to the learners systematically through the sequence operations which helped them in learning process. To secure learners' involvement, the program was interactive and immediate feedback was given by the game. The first stage of the vocabulary learning process, learning various properties of word was presented among which building word relation in order to form correct technical vocabulary in context such as (generate electricity, heating and ventilating, deliver power). Deduction was stressed during this stage in order to store the new technical term in memory. The new technical vocabulary was presented through different kinds of questions. The questions contained only a few clues as to the meaning of the word and mainly served to draw the learner's attention to its morphological composition and syntactic function. Other types were so contextually rich that the word was presented in sentences containing more semantic clues and the learner had to deduce the meaning. True or false questions were designed to reinforce consolidation and ensure long term retention.

## **Results of the study**

### **The first hypothesis**

To test the first hypothesis stating that, "There is statistically difference between the mean scores attained by the experimental group and control group in the post-test of technical vocabulary learning in favor of experimental group." T-test was used to investigate the





difference between the students' mean score in the post test. Cohen's d was used to determine effect size.

### Table 1

*Findings of t-test between the mean scores of the experimental group and control group students on the post- test*

Group	No.	Means	S.D	D.F	T.Value	Sig.	Effect size
Exp.Group	30	14.4	2.163	58	6.26	.001	1.68
Con.Group	30	11.26	1.617				

The results included in the previous table revealed that there was significant difference between the two groups of the study in the post-technical vocabulary test. The mean score of the experimental group was (14.4) while the mean score of the control group was (11.26) with significance of (.001). These results indicated that learning technical vocabulary of the experimental group escalated more than the control group after the treatment. Thus, these results were statistically consistent with the first hypothesis of the study.

### The second hypothesis

To test the second hypothesis stating that "There is statistically difference between the mean scores attained by the experimental group in the pre and post-test of technical vocabulary learning in favor of post-test". T- test was used to investigate the difference between the students' mean scores in the pre –posttest.

### Table 2

*The results of the pre- posttest of the experimental group*

Test	No.	Mean	S.D	D.F	T.Value	Sig.	Effect size
Pre-test	30	5.9	1.8	58	32.6	.001	4.00
Post-test	30	14.4	2.4	54.7			

With reference to the previous results, it was obvious that the mean score of the exp. group after the treatment was (14.4) while the mean score of pre-test was (5.9). Meanwhile, it was found that the t. value was (32.6) with significance of (.001). These results indicated that

there was significant difference between the pre-posttest of the experimental group in favor of the post-test. Thus, these results proved to be statistically consistent with the second hypothesis of the study.

### The third hypothesis

To test the third hypothesis stating that “There is statistically difference between the mean scores attained by the experimental group and control group in the post- motivation questionnaire in favor of experimental group.” T-test was used to investigate the difference between the students' mean score before and after the treatment.

**Table 3**

*Findings of t-test between the mean scores of the experimental group and control group students on the post- questionnaire*

Groups	No.	Mean	S.D	D.F	T. Value	Sig.	Effect size
Exp.Group	30	58.2	1.89	58	32.8	.001	8.24
Con.Group	30	39.9	2.42				

The results included in the previous table revealed that there was significant difference between the two groups of the study in the post-questionnaire. The mean score of the experimental group was (58.2) while the mean score of the control group was (39.9) with significance of (.001). Thus, these results were statistically consistent with the third hypothesis of the study.

### The fourth hypothesis

To test the fourth hypothesis stating that “There is statistically difference between the mean scores attained by the experimental group in the pre- post-motivation questionnaire in favor of post-questionnaire.” T-test was used to investigate the difference between the students' mean score of the experimental group before and after the treatment.

**Table 4**

*The results of the pre- post questionnaire of the experimental group*

Questionnaire	No.	Means	S.D	D.F	T.Value	Sig.	Effect size
Pre-Q	30	38.5	1.5	29	37.7	.001	11.8
Post-Q	30	58.2	1.8	29			



With reference to the previous results, it was obvious that the mean score of the exp. group after the treatment was (58.2) while the mean score of the pre- questionnaire was (38.5) with significance of (.001). These results indicated that there was significant difference between the pre-post questionnaire of the experimental group in favor of the post-questionnaire. Thus, these results proved to be statistically consistent with the fourth hypotheses of the study.

## DISCUSSION

In the light of the data analysis and results, the conclusions can be stated according to (a) the literature review, (b) the results from related studies, and (c) the researchers' personal observations during the study treatment period. The results of the technical vocabulary learning post-test indicated that there was statistically significant difference between the experimental group ( $M= 14.4$ ,  $SD= 2.16$ ) and control group ( $M= 11.26$ ,  $SD=1 .61$ ). Concerning the results, there were several possible explanations for obtaining these results. These results may be due to the immediate feedback which they obtained after answering every single question so students were allowed through this application to monitor their achievement easily and compare their progress with each other. Hence, formative assessment helped in learning the new technical vocabulary. One of the prominent positives of using Kahoot! was that it presented the technical vocabulary accompanied with authentic, variable and updated illustrations from the reality not drawing and this helped to great extent to reach the correct meaning of some technical expressions. Moreover, this association enhanced retention of the new vocabulary as students could repeat the session so many times. Additionally, practicing time management during learning gave the students the opportunity to learn the new vocabulary rapidly and gave quick responses to the questions.

Based on the results of the questionnaire which measured the participants motivation level. The results recommended that Kahoot! Enhanced students' motivation towards learning technical vocabulary. This might stem from the positive feelings they expressed during using the application as students felt that learning with Kahoot became more fun. The competitive learning environment increased their interest and motivation to achieve progress. Engineering students thought that learning technical vocabulary was the main obstacle that hindered or blocked their understanding of English and other subjects which depended on these technical terms. Confronting these discouraging feelings, Kahoot! reduced their negative feelings during learning such as fear of making mistakes and anxiety as self and immediate correction provided them with self-confidence which was reflected on

their motivation towards vocabulary learning. Enjoyable assessments could help students with test anxiety and gave them assurance about their abilities and boost their self-esteem (Johns, 2015). These results concurred with the findings by Al Manar et al (2019), Sartini (2020), Chachra et al (2019) and Wang et al (2016) who found that Kahoot could enhance vocabulary learning and motivated students to learn English vocabulary.

Nevertheless, the researchers noticed that there were some drawbacks or problems which needed to be taken into consideration by instructors. Though Kahoot! offered a very encouraging and positive learning environment and a handy learning tool for students, this tool did not present the required deeper level of thinking. It did not go beyond retention of new technical vocabulary and increasing the size of their technical vocabulary. Therefore, students needed more activities to be communicative and competent learners.

## **Conclusion**

The following conclusion can be drawn:

- Using the online application Kahoot! helps learners in learning technical vocabulary.
- The application has beneficial effect on promoting students' motivation towards learning technical vocabulary.
- Immediate and formative assessment presented by the application enhance learning.
- Exposing students to positive and competitive learning environment improve their learning.

## **Recommendations**

From the previously mentioned, these recommendations can be driven:

- It is recommended to use technological devices partially in learning.
- Engineering students need various strategies to master technical vocabulary.
- Affective factors such as motivation should be taken into consideration in teaching ESP.

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