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Integrating Clickers in English for Specific Purposes (ESP) Classes:

A Study on the Effectiveness of Kahoot! Application in Algerian Context

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Abstract

This research study aims to investigate the effectiveness of incorporating technology, specifically clickers like the Kahoot! app, in an English for Specific Purposes (ESP) classroom. The primary objective is to enhance learning outcomes through real-time engagement and assessment. The methodology employed a comparative analysis of pre-test and post-test scores between control and experimental groups, with additional gender-based comparisons within the experimental group. The results indicate that the experimental group, utilizing clickers, performed better in post-test scores compared to the control group. However, there was no significant difference observed between male and female participants within the experimental group. Based on these findings, the study recommends that ESP instructors integrate clickers into their teaching practices to improve student engagement and learning, underscoring the value of technology in ESP education.

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1. *Introduction*

English for specific purposes (ESP) is a teaching and learning approach in which the course, its content, and objectives are tailored to the specific needs of the target learners, in contrast to other pedagogical approaches (Lesiak-Bielawska, 2015). ESP was developed as a component of language teaching due to the growing importance of international language use in technology and commerce, as well as a shift in language teaching from grammar-based to actual language use in specific contexts (Arnó-Macía, 2012). These developments necessitated a focus on the real-life communication in ESP, which is in line with the constructivist learning perspective that emphasizes the use of language in real-life situations rather than rote memorization of rules (Asmali, 2018).

The nature of language varies considerably depending on the context, such as physics, commerce, engineering, medicine, and so on. Therefore, the activities and materials used in ESP courses in these specific fields should be carefully selected based on the needs and desires of the learners. To overcome this challenge, ESP teachers have tried to incorporate technology in their classes, which has affected ESP pedagogy as a result. Technology has had a significant impact on language learning and ESP because it is widely used in all spheres of life. Language learning teachers have sought complete integration of computer and mobile phone technology into the language learning process. The development of new technologies has always kept pace with language learning. The integration of technology into the ESP curriculum provides students with a variety of learning opportunities and benefits, including interactive and communicative activities related to their professions, as well as tools for feedback and self-evaluation in a specific context. (Bunce et al., 2016)

The benefits of technology in English for specific purposes (ESP) include the development of materials, course design, and the use of computer-assisted language learning. ESP practitioners integrate various multimedia tools and online sources to expose students to authentic language use in their fields of interest. This approach offers tailored learning environments, task-based and collaborative learning activities, and content-based materials. However, the effectiveness of technology use and student behavior in the classroom can be influenced by the approach that teachers adopt. An authoritarian style and strict control may hinder the benefits of technology use in language learning.

The use of technology by ESP practitioners has given researchers in the field of language learning and teaching the

opportunity to better understand the language used in professional and academic communication, as well as the implications of technology in ESP classes. In addition, mobile learning and related devices have allowed students with different learning styles to actively participate in the learning process. As a result, several researchers have conducted studies to investigate the impact of technology use in both general language and ESP classes, using tools such as wikis, blended learning, Twitter, multimedia, and interactive whiteboards. Chliaras (2014) also mentioned several new tech devices used in ESP classes, such as student response systems and digital projectors, particularly in higher education contexts.

According to Martyn (2007), student response system, also known as clickers, is a technology that allows students to answer questions in class through handheld devices. Clickers are called "key pads" or "clickers" in the USA and "handsets" or "zappers" in the UK. Although clickers are commonly used in large educational settings, small institutions and classes also employ this technology (Caldwell, 2007). While clickers are popular in General English classes and many other disciplines, including economy (Barnett, 2016), chemistry (Chen & Lan, 2013), engineering, and computer science (Beaty et al. 2006), there is a lack of research on their use in ESP contexts. This research is motivated by this fact (Bergtrom, 2007).

Moreover, the demand for ESP has increased due to globalization, international exchanges, and the need for skilled professionals. This means that people are required to have a broader range of vocabulary and be proficient in the communicative use of English in specific fields such as politics, science, and tourism (Beshaj, 2016). Being proficient in the language relevant to the employee's area of expertise is vital to be recognized as a "qualified employee" in an international context. In the physics sector, for instance, foreign language speakers can be more comfortable in their position if they have good command of the specific language used. However, despite the increasing number of English speakers, there is still a noticeable shortage of employees with sufficient English proficiency for the physics labs in Algeria.

Several studies have reported positive outcomes of using clickers in the classroom, including increased student engagement and learning (Barnett, 2016). Despite the growing popularity of gamification in education, including the use of clickers, it has not been widely used in ESP classes. To address this gap, this experimental study aims to investigate the impact of clickers on language development in physics classes. The study involves a control and an experimental group and will examine the extent to which the use of clickers affects student learning in ESP classes and whether male and

female participants differ in their response to the use of clickers. This study seeks to answer these two main questions:

- To what extent does the integration of technology, specifically clickers like the Kahoot! app, impact learning outcomes in an English for Specific Purposes (ESP) classroom?
- Does gender play a significant role in the effectiveness of clicker-based technology in improving learning outcomes within the experimental group?

Also the researchers in this study aims to prove or disapprove these two main hypotheses:

- Null Hypothesis (H0): There is no significant difference in learning outcomes between the control group (non-clicker-based instruction) and the experimental group (clicker-based instruction) in the ESP classroom.
- Alternative Hypothesis (H1): Clicker-based instruction in the ESP classroom leads to significantly improved learning outcomes compared to non-clicker-based instruction.
- Null Hypothesis (H0): There is no significant difference in learning outcomes between male and female participants within the experimental group using clicker-based instruction.
- Alternative Hypothesis (H1): Gender has a significant impact on learning outcomes within the experimental group, and there is a difference in performance between male and female participants using clicker-based instruction.

Most importantly, this study investigates the application of clickers in English for Specific Purposes (ESP) classes, particularly focusing on the field of physics, which has not been extensively explored before. Additionally, the research delves into potential gender differences in the impact of clickers on student learning outcomes within ESP classes.

2. *Literature Review*

Nowadays, students face serious issues like underachievement and emotional problems that can lead to dropouts (Battin-Pearson et al., 2000). This process of disengagement, absenteeism, and failure in classes is caused by student alienation, tardiness and their lack of engagement. Constructivism highlights that knowledge cannot be transmitted to passive recipients (Bunce et al., 2016), and if traditional teaching methods are used, students tend to become bored and ultimately drop out of classes.

Not all learning conditions are equal. While there are many distractions available to students, such as the Internet, social media, and mobile phones, the use of appropriate materials and technology can engage and stimulate students, leading to meaningful learning and improved academic performance. The use of gamification through technology is a method to make students more active and engaged in the learning process, and can extend their attention span in class. Successful gaming environments provide students with immediate gratification and short-term successes, which can be more effective than complex and traditional learning methods.

Clicker systems are a vital component in the implementation of gamification techniques that engage students and promote their active participation in classrooms. These systems utilize small transmitter devices, which students use to respond to multiple-choice or similar questions projected on a screen by the instructor. Clickers enable teachers to divide complex subjects into smaller elements and ideas, promoting interactive and contextual learning. Clickers are particularly effective in redesigning large classes by facilitating changes in teachers' teaching styles and learners' learning styles. (Barnett, 2016).

The clicker system not only keeps students engaged but also helps teachers assess their understanding of the topic and provide immediate feedback and remedial instructions (Martyn,2007). Clicker systems are not complex and require only a computer, projector, and clickers which can be replaced with mobile phones. This frees teachers from technical work and allows them to focus on the topic (Boumediene, 2018). Results can be displayed anonymously or linked to specific students, and some applications like Kahoot! allow students to use preferred nicknames (Boumediene, 2019).

The philosophical basis of the clicker system is rooted in the technological proficiency of the current generation of students and the limitations of passive learning (Lesiak-Bielawska, 2015). Clickers offer the advantage of not requiring major changes in physical classroom infrastructure (Butler-Pascoe, 2013), leading to numerous studies exploring their efficacy in various settings and fields (Butler-Pascoe, 2013). In the field of language teaching, clickers have shown positive outcomes in General English classes, including enhanced engagement and concentration of students, better feedback, and increased cooperation and competition among students (Lesiak-Bielawska, 2015). While the majority of these studies reported positive effects, Prieto (2014) found negative results when comparing clickers to traditional teaching methods for Spanish as a second language in terms of reading ability.

Although most studies showed positive outcomes regarding the use of clickers in language teaching, some researchers had different views. Beshaj (2016) argued that the questions within the system had a greater impact on student learning than the clickers themselves. Beaty et al. (2006) also suggested that the questions used in the system should serve a specific pedagogical purpose and differ from traditional questions. Despite this, the integration of mobile applications like Kahoot! is seen as highly successful in improving foreign language learning (Bulter-Pascoe, 2016).

2. *Methodology*

This study employed an experimental methodology consisting of pre-test and post-test design, utilizing two classes - one experimental and one control. In light of implementing a new clicker technique, intact classes were used to address the lack of random selection, as it was considered the most ecologically sound setting. In each academic year, students attend General English and ESP classes in both the first and second semesters. Both General English and ESP classes are assessed with a written mid-term and a final exam in each semester. The study involved two classes in the physics department, with 24 students in the control group (with 12 males and 12 females) and 19 students in the experimental group (with 6 females and 13 males), all aged between 19 and 22. Both groups were taught the same materials and assessed with the same examinations by the same instructor in both General English and ESP classes

3.1 Research Design and Instruments

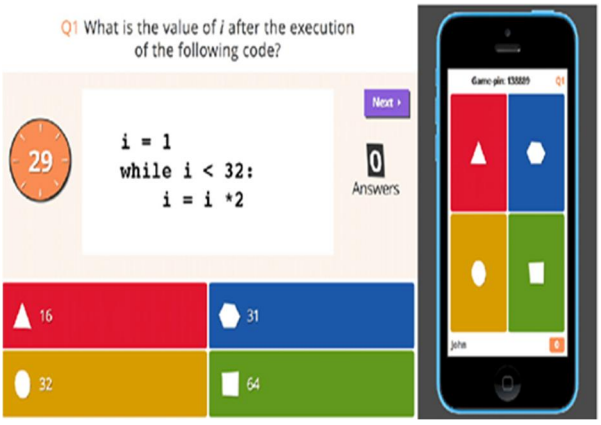
To begin with, a pre-test was administered to both the control and experimental classes. The pre-test consisted of 76 multiple-choice questions based on the first 10 units of the ESP book, which were taught separately in each week of both classes. During the course, students in both classes watched the video of the main dialogue several times, and were taught new vocabulary words for each unit. The ESP courses in both classes included open-ended questions about the dialogue, grammar topics relevant to the students' future work, such as polite expressions, handling complaints, and tag questions, as well as identification of problems related to the weekly topics in short videos and guided role play activities.

Furthermore, even though both classes received the same instruction, the experimental group underwent a distinct procedure. Specifically, students in the experimental group were mandated to install the Kahoot! application, which was utilized as a clicker for the study. This application is among the most prevalent clicker applications that can be used on any device with a web browser or via its smartphone application. Using Kahoot!

instructors were able to obtain an elaborate report on the students' weekly and test performance. The report comprises the percentages of correct and incorrect answers, feedback from students in the form of a Likert scale, and an individual analysis of every participant's answer time in seconds, as well as their correct and incorrect answers

All of the students involved in the study were in possession of smartphones capable of running the Kahoot! application. During each week, the experimental class followed the same procedure, which involved receiving a unique pin number that enabled them to join the game. Typically, Kahoot! allows users to select their own usernames; however, students were instructed to log in using their actual names so that each student's points could be identified, and a daily winner could be declared and celebrated. In order to participate in the game, students were required to look at the screen displayed via the projector to view the questions since they did not appear on their smartphones. To provide their answers, students selected one of the colored figures displayed on their smartphone's screen. After answering each question, students were able to view whether they answered correctly or incorrectly on both their device and on the screen (Figure 1).

Fig.1. A Screenshot of a Student' s Mobile Phone



In addition to answering questions correctly, students' scores were also based on the time it took them to provide their answers, as faster correct responses received higher scores. The Kahoot! program also displayed a list of students according to their scores on the screen after each question, which increased their excitement and engagement in the game. The questions were also enhanced with visuals, such as pictures or videos sourced from YouTube.

The control group in the ESP class covered the same topics and used the same teaching method as the experimental group, with the only difference being the absence of the clicker system. The same words, grammar structures, and images used in the experimental group were also available to the control group through activities in the book and worksheets provided by the instructor. This means that the same questions answered by the experimental group using the clicker system were also answered by the control group. The control

group watched the same videos as the experimental group but responded to the questions orally. The images displayed through a projector in the experimental group were printed on worksheets for the control group to identify by selecting the correct option from a set of multiple choices.

At the end of the 10-week period during which the clicker system was used in both the experimental and control groups, a post-test was administered consisting of the same questions as the pre-test.

3.2 Data collection and Analysis

Because the small sample size and lack of random sampling were not suitable for t-tests, non-parametric tests were used in this study (Tailor, 2005). The Mann-Whitney U test was used to compare pre-test and post-test scores between the control and experimental groups and to determine if there was a significant difference between them. The same test was also used to compare pre-test and post-test scores between genders in the experimental group. To compare the pre-test and post-test scores of the experimental group and the scores between genders in the experimental group, the Wilcoxon Signed Rank Test was used. This test compares the rank of the values at two different time periods to determine if there is a difference between them (Beshaj, 2016).

4. Results and Discussion

At the beginning of the study, a pre-test was conducted to assess the baseline knowledge of both groups about the topics listed in Table 1. The table below shows the mean scores obtained from the pre-test. Although the experimental and control groups had slightly different pretest mean scores, the Mann-Whitney U test was conducted to determine if there was a significant difference between the two groups. The results of the test revealed that there was no significant difference between the experimental group, with a median score of 50, and the control group, with a median score of 42.10, with a U value of 161.500 and a p-value of .103. This indicates that both groups had the same level of knowledge about the pretest questions, which were also used as the post-test questions after a 7-week period of implementing clickers with the experimental group.

Table 1 presents information on the performance of students in the experimental group over a 7-week period during the implementation of the clicker system. It shows the number of correct and incorrect answers given by students, as well as the average time they took to answer questions. The purpose of this table is to provide an overview of the students' performance before presenting the results of the statistical analyses.

	test	Group
	Experimental n=19	Control n=24
Pre-test	48.85	42.50

Table 2 shows that during the 7-week implementation of the clicker, the students in the experimental group took less time to answer both correct and incorrect questions, while their accuracy remained almost stable. Interestingly, the average time to answer was always higher for incorrect answers, indicating that students spent more time on questions they answered incorrectly. Moving on to the first research question, the Mann-Whitney U test showed that the post-test scores of the experimental group were significantly higher than the control group, even though there was no significant difference in their pre-test scores. The Wilcoxon Signed Rank Test also indicated a significant improvement in the experimental group's post-test scores compared to their pre-test scores. Out of 19 students, 17 in the experimental group performed better in the post-test, with an average score of 61.35, while the control group's average score was 44.45. However, the low post-test scores of the control group did not show a significant difference from their pre-test scores.

Table 2. The Students' Performance in the Experimental Group

	Kahoot Score	Correct Answer	Incorrect Answ.
1st week	78.35	78.96	6.50
2nd Week	80.37	75.62	5.59
3rd Week	80	74	5.13
4th Week	78	65.7	4.87
5th Week	58	52	6.06
6TH Week	80	19.7	5.13
7TH Week	75	25	6.23
Average of weeks	74.61	25.39	5.16

The study showed that using clickers in ESP classes for physics led to better performance compared to not using clickers. Although there is limited research on the use of clickers in ESP, this study supports previous findings on the positive impact of clickers on language performance in General English. While the study did not collect in-depth data on the experimental group's views on clickers, it suggests that the game-like atmosphere, feeling of winning, and instant gratification provided by clickers may increase learners'

participation and success in ESP classes. Previous studies have shown that male students have a more positive attitude toward clickers and a higher tendency to feel stimulated by them, which could explain why male students performed significantly better in the post-test compared to their pre-test scores.

While it may not be accurate to attribute all of the success of the experimental group solely to the use of clickers, it is clear that clickers played a significant role in engaging students and improving their performance. The results strongly support the use of clickers as a tool to enhance learning in ESP classes, particularly for students studying physics in Laghouat, who typically struggle in these classes due to low English proficiency and limited resources. Clickers may be a key factor in improving their performance by addressing these challenges.

Also, the study reveals that students use their smartphones for various purposes on campus, including communication and entertainment, but they also serve as a major distraction during classes. To transform this negative influence into a teaching aid, Kahoot! can be utilized to enable students to use technology to learn. While the results cannot be applied to all physics students due to their varied characteristics, the experimental group's results provide valuable knowledge about the effectiveness of using Kahoot! and clickers.

5. Conclusion

In conclusion, this study reveals that clickers can serve as valuable supplementary tools to enhance the performance of English for Specific Purposes (ESP) students, particularly in the field of physics. By incorporating clicker use into the iTools sets of the books, in addition to related topic videos, ESP materials designers can create more interactive and engaging learning experiences. The benefits of clickers highlighted in numerous studies encourage ESP instructors to consider integrating them into their classes.

Summary of Findings:

- Clickers used as supplementary tools improved student engagement and participation in ESP classes.
- Integrating clicker questions and activities aligned with lesson objectives enhanced learning outcomes.
- Inclusion of clicker activities in iTools sets provided interactive and engaging learning experiences.

- Clear instructions and ample practice opportunities facilitated students' comfort in using clickers and iTools.

Limitations:

- The study focused on the field of physics in ESP classes; other subject areas may yield different results.
- The sample size and duration of the study could impact the generalizability of the findings.

Recommendations:

- Utilize clickers as supplementary tools to enhance student engagement and participation, allowing for quizzes, opinion polling, and instant feedback.
- Design clicker questions and activities that align with the learning objectives of the lessons or units.
- Incorporate iTools sets with clicker activities to create interactive and engaging learning experiences.
- Include more clicker activities in iTools sets alongside related topic videos in ESP books.
- Provide clear instructions and ample practice opportunities for students to become comfortable with using clickers and iTools.
- Monitor students' progress and offer feedback to support their language skill improvement.
- Foster student collaboration and competition through group activities or games like Kahoot! using clickers.

By implementing these recommendations, the use of clickers and iTools can effectively enrich language learning experiences within ESP classes, fostering engagement and improved outcomes.

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