

# **Impact of an educational application on EFL students' learning and motivation of phrasal verbs**

## **Abstract**

Phrasal verbs are a complex language structure that is formed by a verb and a preposition, an adjective, or an adverb. Due to this situation, EFL students often have problems connecting phrasal verbs to their meaning. This causes that in the long run, students forget the meaning and structure of phrasal verbs, which usually translates into students' demotivation to study this grammar structure. This study proposes a digital educational application to support the learning process of phrasal verbs. To evaluate the efficacy of the application, we conducted a case study with 30 students, who were assigned to the experimental or the control group. The students in the experimental group learned phrasal verbs using the proposed application, while the students in the control group were taught through traditional method. The study measured the students' learning gains, knowledge retention, and motivation. The results indicate significant outcome in favor of the experimental group in the three measured variables. This indicates that the use of the proposed digital educational resources is convenient to study phrasal verbs, and therefore, we encourage professors and researchers to consider similar technology-based resources to promote EFL.

*Keywords:* EFL; learning gains; knowledge retention; motivation; phrasal verbs.

## **Resumen**

Los verbos frasales son una estructura lingüística compleja que está formada por un verbo y una preposición, un adjetivo o un adverbio. Debido a esto, los estudiantes de EFL a menudo tienen problemas para conectar los verbos frasales con su significado. Esto provoca que los estudiantes olviden el significado y la estructura de dichos verbos, lo que suele traducirse en una desmotivación de los estudiantes para estudiar esta estructura gramatical. Este estudio propone una aplicación educativa digital para apoyar el proceso de aprendizaje de los verbos frasales. Para evaluar la eficacia de la aplicación, llevamos a cabo un estudio de caso con 30 estudiantes, que fueron asignados al grupo experimental o al de control. Los estudiantes del grupo experimental aprendieron los verbos frasales usando la aplicación, mientras que los estudiantes del grupo de control aprendieron a través del método tradicional. El estudio midió los logros de aprendizaje de los estudiantes, la retención de conocimientos y la motivación. Los resultados indican desenlace significativo a favor del grupo experimental en las tres variables medidas. Esto indica que el uso de los recursos educativos digitales propuestos es conveniente para estudiar los verbos frasales y, por lo tanto, alentamos a los profesores e investigadores a considerar recursos basados en tecnología similares para promover ILE.

*Palabras clave:* ILE; ganancia de aprendizaje; motivación; retención del conocimiento; verbos frasales.

## **Introduction**

Like other languages, English has a variety of verb forms and conjugations that might cause learners to encounter a diversity of issues. Learning phrasal verbs, which are verbs that, when combined with a preposition, an adverb, or an adjective, modifies the meaning of the verb's root, is one of the biggest hurdles.

Those who speak informal English regularly utilize phrasal verbs; they are unconsciously produced. In fact, a lot of native and non-native phrasal verbs users are oblivious to what they say or do when they speak. Unfortunately, phrasal verbs may negatively affect how language is interpreted because they would combine the meanings of two or three words into one unit that might have a totally different formula and semantic meaning (Nasarat, 2018).

Phrasal verbs are important vocabulary in learning English since they frequently appear in written and spoken discourse. However, due to their complex semantic formation and a large number of tense variations, they pose a challenge for foreign language learners. As a result, learning English as a second language cannot just focus on learning grammatical structures and vocabulary separately; rather, it is necessary to teach and learn about the culture too, with methods required to get the proper learning motivation and the required learning retention.

### ***Problems when learning phrasal verbs***

Different situations such as tastes, motivations, desires to learn, pressure to complete a course or pass a subject, or the need to communicate will intersect the path of learning a second language. The ability to learn will depend on the above-mentioned factors, but mostly on how well new knowledge is retained. As a result, both, those who learn and those who teach have the responsibility of improving the assurance of the teaching and learning process.

Many investigations have analyzed the efficiency of the use of technology in the processes of learning English as a second language with the goal of finding ways that can facilitate these processes, especially for those who teach. In his research, Nasarat (2018) stated that interpretation might be a visible barrier to learning phrasal verbs in English. The study examined the challenges of interpretation and selected groups with varying degrees of relationship with the English language, by measuring background and performance levels. According to the research, learning a language systematically makes it much more difficult to learn phrasal verbs. Literal translations are used instead of giving the verb the real meaning, which happens in the case of phrasal verbs changing the meaning because of the type of combination. Therefore, the identification of the source of this weakness, allows interpretation strategies that can resolve the meanings and contribute, enrich and rethink not only the instruction, but also the design of a course or a class.

The meaning of infinitive verbs is frequently confused with that of phrasal verbs, which is why students dislike them, because they require memorization and change their meaning when formed from a verb and a preposition, an adjective or adverbs. As a result, those who learn them lack the necessary empathy for learning and motivation to retain what they have learned. This is because phrasal verbs have specific meanings and applications; therefore, learning them demands motivation, effort, and dedication. Any minor alteration can entirely alter the meaning of a sentence. Since native speakers learn phrasal verbs in a context, their use is more natural, and therefore for non-natives, it requires practice, memory, and motivation to learn and use them.

It may be challenging to decide whether to emphasize the verb or the particle because it depends on the phrasal verb's separability or non-separability, transitivity or intransitivity, or whether it is a two or three-word phrasal verb (Hart, 1999). As a result, studying phrasal verbs involve activities aiming to ensure students to retain information they can use to communicate in formal and informal environments. This article aims to demonstrate how using technology might help students become more motivated, which turns into retaining information related to these verbs.

For ESL students, learning phrasal verbs is intrinsically challenging. This shows a need for a deeper comprehension of this grammatical structure and necessitates the development of new instructional techniques that go beyond syntactic identification or lists and groupings for memorizing (Gustafson, 2015). According to the study's findings of Nasarat (2018), students frequently employ simple word meanings rather than explicitly addressing phrasal verbs. This has as a result, the erroneous understanding of phrasal verbs in the majority of cases. In addition, for simultaneous interpretation, interpreters need to develop good listening abilities. They occasionally need to concentrate for a very long time in order to memorize groups of words that are continuously spoken. Therefore, the development of speaking, listening, reading, and writing abilities can all be helped by appropriate phrasal verb instruction (Chaikovska, 2022). As a result, numerous studies have looked at various approaches to teaching phrasal verbs in order to effectively learn them. As an illustration, Mohammadi and Mirdehghan (2014) studied the effectiveness of teaching phrasal verbs via blended learning among Iranian EFL learners and used computer-mediated communication as their method of instruction. Forty Iranian EFL students were chosen for this study. The findings revealed that online exercises might encourage EFL students to take an active part in their phrasal verb acquisition. As a result, they advocated for employing this method of instruction given the opportunity for EFL students to practice grammar.

Chaikovska (2022) investigated the effectiveness of an android application for phrasal verb vocabulary acquisition. The results showed that modern software was simple to use, offered a wide range of tasks, and utilized particular processes for activating long-term memory. Given that phrasal verb interpretations may affect learning, these findings allow us to assess the significance of expanding vocabulary and using technology assistance to get student's motivation to increase learning retention.

### *Using technology for learning phrasal verbs*

Technological advances and the creation of new tools permeate education to try to go hand in hand with the evolutionary processes of the learner. Current students, belong to migrant groups or “digital natives” (Prensky, 2013). They were born in the digital era and were raised amidst video games and Internet. This particular situation allows them to go in search of information from the network and apply it in thought processes to transform them into significant knowledge.

Derived from information and communication technologies (ICT), arises the concept of technologies for learning and knowledge (TLK), which seek to be oriented towards more educational uses and purpose according to Lozano (2011). It is then in this transition of ICT aimed at improving learning and teaching processes, where TLK appear, so we can establish that from the information society in which we begin to handle ICT, we pass to the Knowledge Society, in which the management of technologies is not the accumulation and management of information, but rather its importance lies in the fact that this information is transformed into knowledge (Moya, 2013).

The relevance of the transition from ICT to TLK focuses on contributing to reduce the digital gap between teachers and students and in this way include all the agents that participate in the learning process to optimize the use of technological tools to re-signify the way of learning, focusing on the interests of those who acquire the new knowledge and thus contributing to motivation.

Latorre et al. (2018) proposed the TLK as a concept that can be used to identify technologies so that they are drivers of the strengthening of teaching and learning processes. Therefore, TLK's main characteristic is to transform educational realities since they understand global contexts in such a way that they allow innovating, expanding and bringing knowledge to those who learn. Technologies for learning and knowledge are mainly characterized by the construction of new knowledge and communication, in the field of education, so they propose to go beyond ICT in the search for knowledge and meaningful learning.

Zheng et al. (2020) examined the effects of the flipped classroom approach in comparison to conventional instruction that was based on conferences, measuring roughly 12 variables but paying particular attention to achievement and motivation for learning. They subsequently discovered that the flipped classroom strategy had a favorable impact on the sample results, which showed that motivation and learning achievement was statistically considerably higher. Based on previous research related to the issue and the constant analysis of this research, in addition to its implications, they seek to implement practices in the use of the flipped classroom approach. However, other studies focused on learning phrasal verbs with technological tools were able to show that these resources could significantly increase the motivation levels of students.

To better understand how the implementation of a response system could increase motivation to learn English phrasal verbs, Vurdien (2021) conducted an experiment in which it was discovered that using Socratic application as a response system significantly increased motivation because it dynamized the learning processes of Phrasal Verbs. As a result, the competition between pairs through the application showed that Socratic is not only a reliable tool to use for educational purposes, but also that the students' response was positive.

In addition to the above, Yilmaz et al. (2022) carried out an empirical investigation to discover the retention levels when learning English vocabulary in preschool children with the use of augmented reality technology, when making a comparison between the pre-test and post-test, it showed as result that there was a significant increase in vocabulary learning, even after two weeks when performing a post-test, despite the fact that part of the score had decreased, taking into account the age of students, knowledge retention levels remained at a high percentage.

Wang et al. (2022) made a study in which the goal was evaluating knowledge retention as well as motivation for learning vocabulary through mobile devices, making the activities directed exclusively by the students and not by their instructors. Taking into account that acquiring vocabulary when learning a second language can influence better performance and better language skills, there are circumstances that can condition this statement. Motivation and being clear about how to learn that new vocabulary are significant variables that could guarantee such learning.

### **Theoretical framework**

The several generational changes, technology advances, ease of access, and the influence of social networks have driven different disciplines to set themselves new challenges, and education cannot be excluded from this revolution in any manner, for this reason, studies on teaching and learning are increasingly focusing on the use of technology as a tool to support or improve learning outcomes. The two channels of information processing that are used to acquire knowledge are the main emphasis of Mayer's multimedia learning theory (2002). So that learning is achieved as the development of new knowledge, the activities' design takes a visual and auditory approach. Where the learner actively engages in the development of knowledge in environments that the educator promotes. In the process of this research, multimedia learning-responsive activities were created and used, together with the mobile device use and other technology resources, to allow not just information acquisition but also knowledge retention. Although most individuals can now afford information, the educational sector still carries the majority of the responsibility for gaining knowledge and verifying sources. Mayer characterizes teachers as material creators and bases his claims on behavioral theory. He argued that to learn new information, a person must first connect it to previously learned material. Learning new information also requires using two different channels for information processing, the visual-graphic, and auditory-verbal channels, given the above, the activities employed in this research were designed with the use of visuals, sounds, video, and applications in a way that encourages students to get the highest score through alerts and scores. The motivation concepts mentioned in this article contain different characteristics but a close relationship with the process of learning a new language. In this context, motivation refers to a mixture of impulses accompanied by interest and effort to achieve the goal of learning, which produces a more favorable attitude towards learning a language, which requires both willingness and motivation to achieve the skills that make up a language, for which there must be incentives that increase motivation.

Taking into account that there are different conceptions of motivation, this subject was investigated in depth in order not only to define the concept, but also to make an attempt to perpetuate the abundance in the elements that compose it and in that order of ideas, to expand and apply them to accomplish higher knowledge retention and interest in the desired subject.

Since this article focuses on promoting motivation to facilitate learning processes, different concepts and approaches are addressed from the educational point of view in learning, this is why the motivation is understood as the state of optimal excitability to start conditioning, as one of the requisites of the central nervous system that makes it possible to start a learning process. Creating appropriate engagement that arouses tonic attention is the definition of motivation for a certain type of academic learning. The incentive must unavoidably be of the sensory-perceptual variety and sufficient to avoid monotony and habituation, which would turn learning into a negative experience according to Azcoaga (2018).

Gardner (1985), in contrast, focuses the term motivation specifically on learning and argues that motivation is a term that regarding the learning of a second language, is often used as a simple explanation of the achievement; if students are motivated to learn the language they will do it. The concept of motivation contains different characteristics but is closely related to the process of learning a new language. In this context, motivation refers to a mixture of impulses accompanied by an interest in achieving the goal of learning, which produces more beneficial attitudes towards language learning. The effort and work that a person does to learn a second language can measure the level of motivation, because the subject experiences the satisfaction that this activity can produce.

Although anyone can do anything without being motivated, the fact that someone is working to achieve a goal does not always imply that person is motivated. It simply means that the person is struggling to get there. Similarly, the pleasure of learning the language or the positive attitude towards the learning process is not a reflection of motivation. A person may want to learn and enjoy the activity but if this is not related to a sacrifice to achieve it, it means that there is no real motivation. It is an illusion that invites reflection, even if it cannot be fully achieved. True motivation is evident when the effort is linked to the desire to achieve a goal and the right attitude towards it.

Educational contexts show the relationship between interest and effort to achieve an objective with learning English in this case; it can be seen daily in classrooms how motivation is a pillar to learning almost anything and this process involves aspects that are relevant to mention before approaching the specific learning of a foreign language.

Based on the above, Ausbel (2009), one of the most important exponents of constructivist pedagogy, determined that significant learning is integrated into the cognitive structure of the learner and states that minimum conditions are required not only in what is learned as an object, but in the subject that makes the process, we all have a set of previous ideas and concepts, Ausbel defines them as a previous cognitive structure that fulfills the function of relating to new information and thus generating new learning, the brain has a programming that prepares it for survival, which is why it has greater potential for learning and it carries out a dual process, which consists of a need to register the knowledge and at the same time to search for the new to learn, it is because when we are faced with a learning situation, there is a part of our brain that asks: Do I need this learning to survive? Yes, or no? If so, we can continue with the learning. However, if the answer is negative, let's forget everything. In this sense, the motivation for new learning is again considered as a determining factor of it according to Pradas (2017).

## **Method**

A case of study was designed to identify the impact on learning gains, knowledge retention, and motivation in EFL students using an educational application. The participants were 30 EFL students' (M= 16.5 years old) who studied in a private high school in Rionegro, Colombia. The students (24 girls and 6 boys) were randomly assigned to the experimental (N= 15) or the control group (N= 15). A control group used the conventional learning method and an experimental group used an education application to learn the phrasal verbs. The students ignored the existence of the other group to avoid confounding effects. The academic level of students in both groups was similar, both being at an intermediate level.

Three activities in total were carried out. In the first intervention, the students of the experimental group to whom activities were applied with the use of technologies for learning and knowledge, played Blooket, a mobile application as the first activity, which is a tool very similar to kahoot. In this game they had to choose from multiple choice options, the correct phrasal verb about education to complete the sentence; In the same way, the control group received a piece of paper with the same phrasal verbs and the activity also had multiple choice options to complete the sentence.

During the second activity, a digital educational resource was carried out on the website: [www.islcollective.com](http://www.islcollective.com) by the experimental group, which allows creating video lessons, by adapting a video from YouTube called: 30+ English phrasal verbs at an American school. The video lesson made on this webpage can be paused by the students to answer comprehension questions through word order, matching, open responses and multiple choice, based on what they have seen, finally, students can see their score at the end of the video. On the other hand, the students of the control group had to answer the same questions of the video lesson, but in a piece of paper as the traditional way.

In the last activity, the experimental group used the charades application, by pairs, the students created a folder in the application with the phrasal verbs that the teacher dictated to them, student A had to place the mobile device on the forehead, which showed on the screen the phrasal verb that student B had to describe to student A, so that in this way student A could identify the phrasal verb. If the answer was correct, the student had to move the device down, if it was wrong it moved it up. The control group matched the same phrasal verb with the correct description on a sheet in a traditional way and the answers were reviewed by the teacher.

The digital resources material was designed by three researchers who together have more than 30 years of teaching experience. These activities were approved and validated by teachers and a program coordinator in the English area.

### **Research instruments**

This research sought to measure learning gains, knowledge retention, and motivation. To measure the learning gain, a pre-test was applied to the two groups, which consisted of 33 multiple choice questions where the students chose the correct phrasal verb between three options, then a post-test was applied of 30 equally multiple-choice questions to both groups, in order to check the gain of knowledge at the end of the activities. The motivation was measured with an IMMS survey, which assessed attention, trust, satisfaction, and relevance, on a 7-item Likert scale and finally, after a school term of ten weeks, a test was applied to measure the retention of knowledge, this consisted of 30 options to match with the correct answer.

## Summary of the results of the motivation surveys.

The motivation survey consisted of 17 questions to measure the four components of motivation (Keller, 2010): Attention, Confidence, Relevance, and Satisfaction. Table 1 shows the results in the control group, while Table 2 shows the results in the experimental group.

**Table 1.** Control group survey

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I liked the activities	7,1	0	14,3	35,7	14,3	21,5	7,1
The order of the activities helped me keep my attention	0	21,4	28,6	7,1	14,3	28,6	0
Instructions were clear	0	0	21,4	7,2	14,3	21,4	35,7
Activities were engaging	21,4	14,3	0	7,2	21,4	28,6	7,1
I learned important things	21,4	7,2	7,1	7,2	0	35,7	21,4
<b>ATTENTION</b>	<b>9,9</b>	<b>8,6</b>	<b>14,3</b>	<b>12,9</b>	<b>12,9</b>	<b>27,2</b>	<b>14,3</b>
While doing the activities, I was sure that I could learn	21,4	14,3	7,2	0	7,1	35,7	14,3
The topic is important	7,1	7,2	0	7,1	28,6	21,4	28,6
The order in the content of the activities helped me be sure that I would be able to complete the exercises.	28,6	0	14,3	28,6	7,1	21,4	0
After doing the activities for a while, I was confident that I would be able to complete them.	28,6	7,2	14,3	14,3	7,1	7,1	21,4
<b>CONFIDENCE</b>	<b>21,4</b>	<b>7,2</b>	<b>8,9</b>	<b>12,5</b>	<b>12,4</b>	<b>21,4</b>	<b>16,1</b>
The phrasal verbs became clear to me after doing the activities	28,6	7,1	14,3	14,3	21,4	7,2	7,1
The phrasal verbs from the activities are useful	14,3	7,1	7,2	14,3	7,1	14,3	35,7
Completing the exercises successfully was important to me	28,6	7,2	0	14,3	7,1	21,4	21,4
I was able to relate the content of the activities to things I have seen, done or thought before	28,6	0	0	14,3	28,6	21,4	7,1
<b>RELEVANCE</b>	<b>25,0</b>	<b>5,4</b>	<b>5,4</b>	<b>14,3</b>	<b>16,1</b>	<b>16,1</b>	<b>17,8</b>

I enjoyed the activities so much, that they helped me to continue until the end	21,4	7,2	14,3	7,1	28,6	14,3	7,1
Completing the exercises was satisfying	14,3	7,1	0	28,6	7,1	28,6	14,3
The activities rewarded my encouragement	28,6	0	14,3	7,1	28,6	0	21,4
It felt good to complete the exercises successfully	28,6	7,2	7,2	7,1	7,1	7,1	35,7
<b>SATISFACTION</b>	<b>23,2</b>	<b>5,4</b>	<b>8,9</b>	<b>12,5</b>	<b>17,9</b>	<b>12,5</b>	<b>19,6</b>
<b>MOTIVATION MEAN</b>	<b>21,4</b>	<b>7,1</b>	<b>7,1</b>	<b>14,3</b>	<b>14,3</b>	<b>21,4</b>	<b>14,3</b>

**Table 2.** Survey Experimental Group

	Strongly disagree	Disagree	Somewhat disagree	Neutral	Some what agree	Agree	Strongly agree
I liked the activities	0	0	0	0	9,1	54,5	36,4
The order of the activities helped me keep my attention	0	0	0	9,1	9,1	27,3	54,5
Instructions were clear	0	0	0	0	0	36,4	63,6
Activities were engaging	0	0	0	9,1	0	27,3	63,6
I learned important things	0	0	0	0	0	9,1	90,9
<b>ATTENTION</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,6</b>	<b>3,6</b>	<b>30,9</b>	<b>61,8</b>
While doing the activities, I was sure that I could learn	0	0	0	0	9,1	0	90,9
The topic is important	0	0	0	0	0	0	100
The order in the content of the activities helped me be sure that I would be able to complete the exercises.	0	0	0	9,1	27,3	9,1	54,5
After doing the activities for a while, I was confident that I would be able to complete them.	0	0	0	9,1	9,1	27,3	54,5
<b>CONFIDENCE</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>4,5</b>	<b>11,4</b>	<b>9,1</b>	<b>75,0</b>
The phrasal verbs became clear to me after doing the activities	0	0	0	0	18,2	45,5	36,4
The phrasal verbs from the activities are useful	0	0	0	0	0	18,2	81,8

Completing the exercises successfully was important to me	0	0	0	0	9,1	27,3	63,6
I was able to relate the content of the activities to things I have seen, done or thought before	0	0	0	0	9,1	27,3	63,6
<b>RELEVANCE</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9,10</b>	<b>29,575</b>	<b>61,35</b>
I enjoyed the activities so much, that they helped me to continue until the end	0	0	0	0	18,2	18,2	63,6
Completing the exercises was satisfying	0	0	0	0	0	54,5	45,5
The activities rewarded my encouragement	0	0	0	0	27,3	9,1	63,6
It felt good to complete the exercises successfully	0	0	0	0	0	18,2	81,8
<b>SATISFACTION</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>0,0</b>	<b>11,4</b>	<b>25,0</b>	<b>63,6</b>
<b>MOTIVATION MEAN</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>9,1</b>	<b>9,1</b>	<b>27,3</b>	<b>54,6</b>

When carrying out the survey, it was desired to know if the degree of satisfaction was independent of the group to which the survey was executed, for which the independence analysis was carried out using the nonparametric Chi-square test, for which the following is defined as a hypothesis:

**H<sub>0</sub>: Independence of the variables.** The satisfaction results are independent of the group to which the survey is carried out.

**H<sub>1</sub>: Variables related to the satisfaction.** Results depend on the group to which the survey is carried out.

With significance level **Alfa = 5%**     **$\alpha = 0,05$**

**P-value = >  $\alpha$  Accept H<sub>0</sub>**

**P-value <  $\alpha$  Accept H<sub>1</sub>**

For this, the IBM SPSS version 24 program was used to obtain the cross tables (Table 3) of the control and experimental groups against the components of the degree of satisfaction of the motivation survey and the chi squared test (Table 4) where:

**P- Value** = 0,284 > alfa ( $\alpha$ ) = 0,05 Therefore, **H<sub>0</sub>** is accepted: the satisfaction results are independent of the group to which the survey was carried out.

**Table 3. Motivation mean**

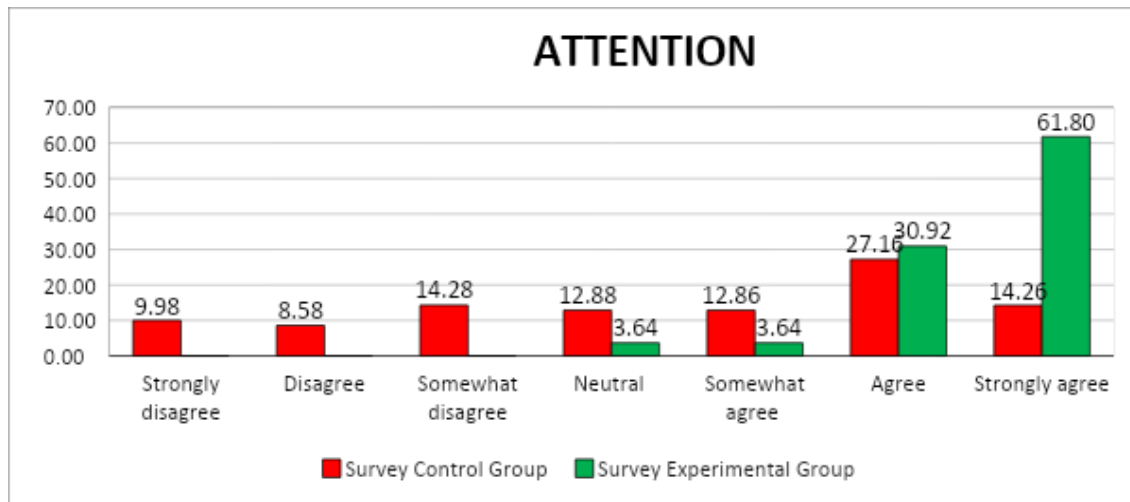
			MOTIVATION_MEAN						Total	
			Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree		Strongly agree
GROUP	Survey Control Group	Count	3	1	1	2	2	3	2	14
		% within GROUP	21,40%	7,10%	7,10%	14,30%	14,30%	21,40%	14,30%	100,00%
	Survey Experimental Group	Count	0	0	0	1	1	3	6	11
		% within GROUP	0,00%	0,00%	0,00%	9,10%	9,10%	27,30%	54,50%	100,00%
Total		Count	3	1	1	3	3	6	8	25
		% within GROUP	12,00%	4,00%	4,00%	12,00%	12,00%	24,00%	32,00%	100,00%

**Table 4. Chi-Squared Test**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Squared	7,413	6	0,284
Likelihood Ratio	9,343	6	0,155
Linear-by-Linear Association	6,585	1	0,01
N of Valid Cases	25		

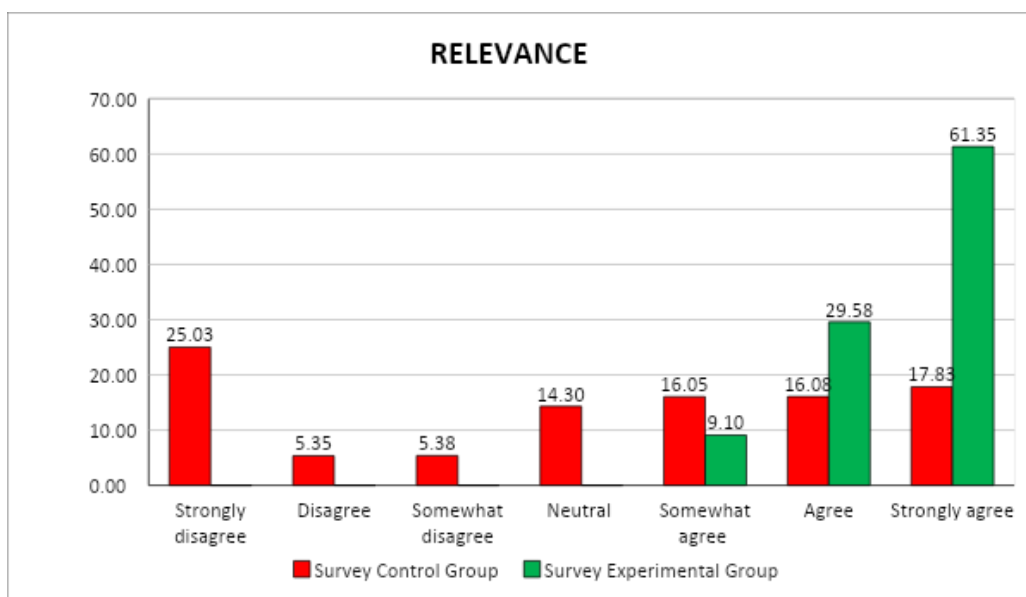
In the attention component (see Figure 1), the students of the control group reflected interest in carrying out the activities in 41.42%, taking as a reference the assessment of agree and strongly agree and it is evident that, in the students of the experimental group, the interest in carrying out activities increased to 92.72%.

**Figure 1.** Attention component



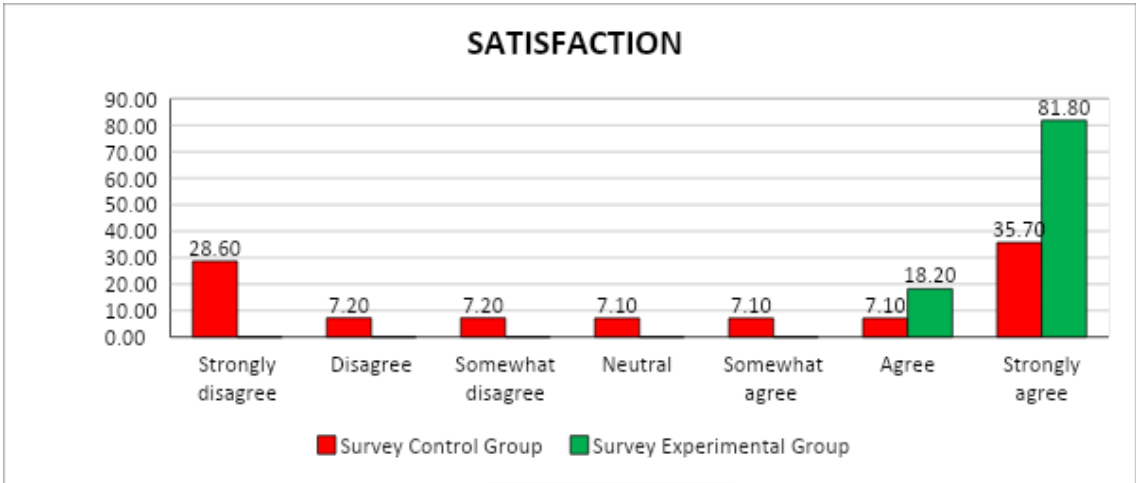
In the relevance component (see Figure 2), 33.91% of the students from control group think that it was useful to carry out the important activities, taking as a reference the assessment of agree and strongly agree, while the students of the experimental group think that the activities are important in a 90.93%, which makes them aware of the importance of learning phrasal verbs.

**Figure 2.** Relevance component



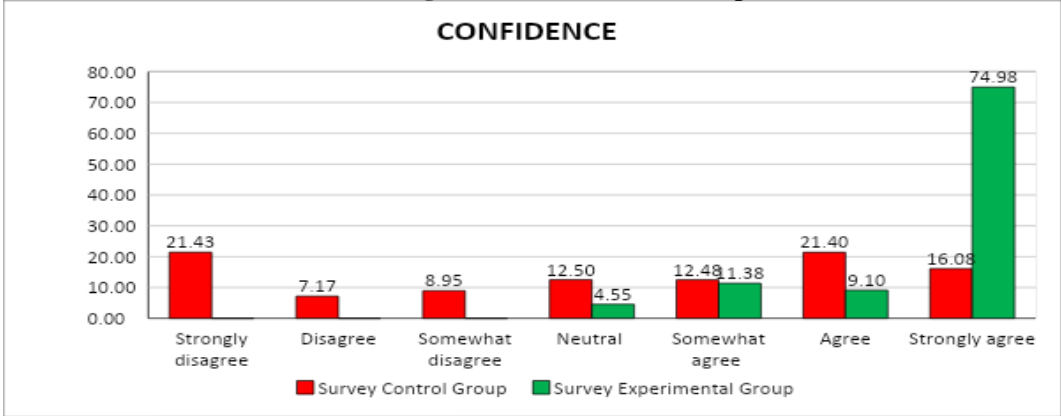
In the satisfaction component (see Figure 3), the students of the control group reflected a feeling of satisfaction when carrying out the activities of 42.8%, taking as a reference the assessment of agree and strongly agree, while the experimental group, the feeling of satisfaction increased to 100%, it means that the activities were very satisfying for them.

**Figure 3.** Satisfaction component



In the confidence component (see Figure 4), the obtained result was that the students had the feeling of control for carrying out the activities in 38.2%, taking as a reference the assessment of agree and strongly agree in the control group and it is evident that the feeling of confidence in experimental group increased to 84.08%.

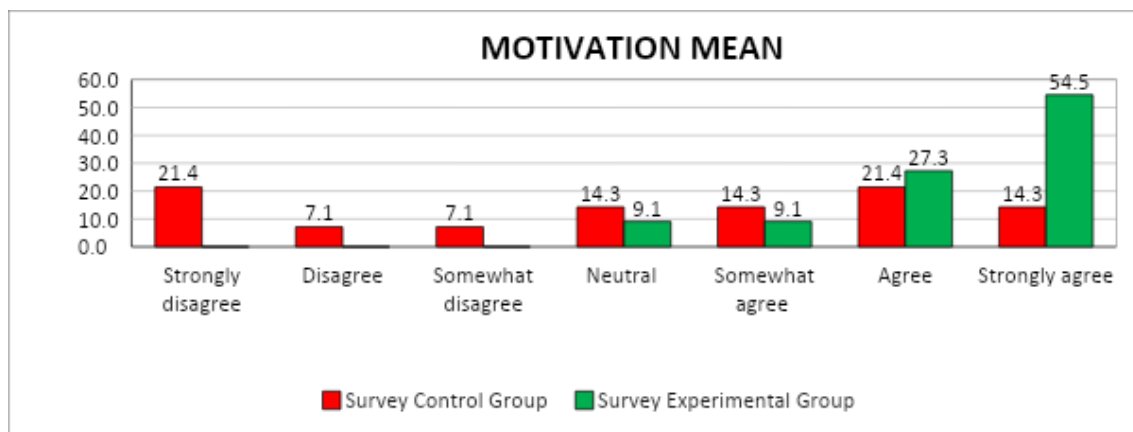
**Figure 4.** Confidence component



It can be concluded that the average of the motivation survey for the four components, taking as a reference the assessment of agree and strongly agree, is 35.7% for the students in the control group and 81.08% for the students in the experimental group.

This seems to indicate, as shown in Figure 5, that the students of the experimental group felt more comfortable with the development of each proposed activity.

**Figure 5. Motivation mean**



In order to determine whether there was a relationship between the use of technologies for learning and the motivation to learn, a pre-test was first used to evaluate the initial level of knowledge and a post-test was then applied to measure whether the students had improved at the end of the activities. Later, a retention test. (Chart 5), was applied to know if the procedure had improved the results of the students after a period. For this, a longitudinal study was carried out where the interest was focused in comparing the differences between two numerical variables, in this case the evaluation of the tests (Before - After) to the same group.

To know what type of test to choose, the assumptions of normality were verified through the Shapiro Wilk statistics taking into account the size of the sample. Subsequently, the bivariate analysis was carried out to identify differences in the means of paired tests between the results of the pre-test, post-test and retention-test of the control group and the

experimental group, this was done using the student's t-test for related samples. The results of this hypothesis test have been obtained using the statistical package IBM SPSS version 24 and are presented in Tables 5 to 8.

**Researcher hypothesis:**

There will be a significant difference between the results of the learning evaluation (pre-test) before applying the technologies for learning and knowledge (TLK) and the results after applying the technologies (post-test and retention-test)

**H<sub>0</sub>: There is no significant difference** between the results of the pre-test, post-test and the retention test.

**H<sub>1</sub>: There is a significant difference** between the results of the pre-test, post-test and the retention test.

Significance level      **Alfa = 5%    α =0,05**

**Table 5.** Test of Normality

<b>Tests of Normality</b>						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Control_Group_PRE_TEST	,206	12	,170	,898	12	,150
Control_Group_POST_TEST	,171	12	,200*	,925	12	,328
Control_Group_RETENTION_TEST	,294	12	,005	,796	12	,009
DIFFERENCE_G_CONTROL	,242	12	,051	,955	12	,706
Experimental_Group_PRE_TEST	,139	12	,200*	,882	12	,093
Experimental_Group_POST_TEST	,210	12	,151	,907	12	,196
ExperimentalGroup_RETENTION_TEST	,219	12	,115	,869	12	,063
DIFFERENCE_G_EXPERIMENTAL	,179	12	,200*	,932	12	,406
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

**Table 6.** Shapiro-Wilk Control Group

<b>P-value (pre-test) =</b>	0,150 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (post-test) =</b>	0,328 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (retention-test) =</b>	0,009 < alfa ( $\alpha$ ) = 0,05	<b>H<sub>1</sub> is accepted</b>
<b>P-value (difference control group) =</b>	0,706 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>

**Table 7.** Shapiro-Wilk Experimental group

<b>P-value (pre-test) =</b>	0,093 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (post-test) =</b>	0,196 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (retention-test) =</b>	0,063 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (difference control group) =</b>	0,406 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>

The data behaves like a normal distribution; therefore, the  $t$  student test can be used to validate the hypothesis.

### **Statistical decision**

Longitudinal study test of two numerical measures that follow a normal distribution, using the Student's  $t$ -test (Related samples). Table 8, 9, and 10 and Figure 6 present the results of the analysis and the validation of the hypotheses.

The criteria for deciding was:

If the obtained probability **P-value**  $\leq \alpha$ , reject **H<sub>0</sub>** (**H<sub>1</sub> is accepted**)

If the obtained probability **P-value**  $> \alpha$ , does not reject **H<sub>0</sub>** (**H<sub>0</sub> is accepted**)

**Table 8.** T of student (Paired Samples)

Paired Samples Test									
		Paired Differences					t	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Survey_Control_Group_PRE_TEST - Survey_Control_Group_POST_TEST	1,33467	22,36670	5,77506	-11,05160	13,72093	,231	14	,821
Pair 2	Survey_Control_Group_PRE_TEST - Survey_Control_Group_RETENTION_TEST	48,44578	9,17804	2,36976	43,36315	53,52841	20,443	14	,000
Pair 3	Survey_Control_Group_POST_TEST - Survey_Control_Group_RETENTION_TEST	47,11111	24,55537	6,34017	33,51280	60,70942	7,431	14	,000
Pair 4	Survey_Experimental_Group_PRE_TEST - Survey_Experimental_Group_POST_TEST	-33,23250	12,13101	3,50192	-40,94018	-25,52482	-9,490	11	,000
Pair 6	Survey_Experimental_Group_PRE_TEST - Survey_Experimental_Group_RETENTION_TEST	-21,28806	27,46450	7,92832	-38,73817	-3,83794	-2,685	11	,021
Pair 5	Survey_Experimental_Group_POST_TEST - Survey_Experimental_Group_RETENTION_TEST	,00000	37,94290	9,79681	-21,01208	21,01208	,000	14	1,000

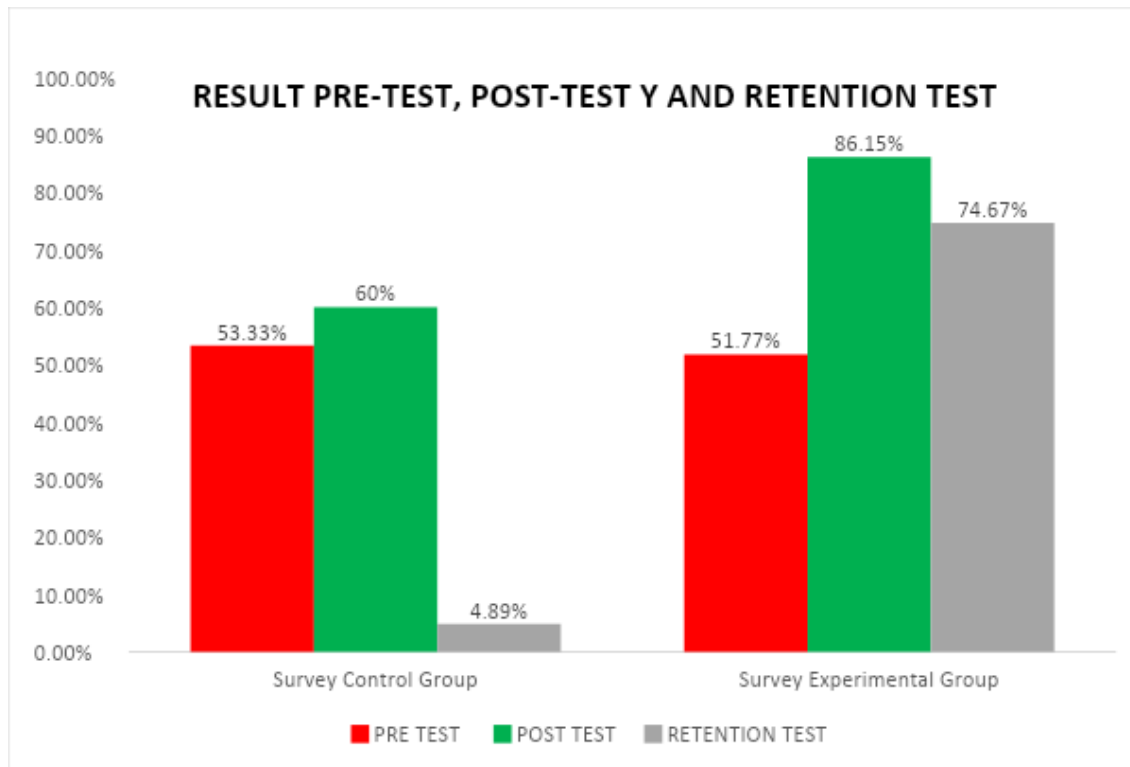
**Table 9.** Control Group

<b>P-value (pre-test , post-test) =</b>	0,821 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>
<b>P-value (pre-test, retention-test) =</b>	0,00 < alfa ( $\alpha$ ) = 0,05	<b>H<sub>1</sub> is accepted</b>
<b>P-value (post-test, retention-test) =</b>	0,00 < alfa ( $\alpha$ ) = 0,05	<b>H<sub>1</sub> is accepted</b>

**Table 10.** Experimental Group

<b>P-value (pre-test , post-test) =</b>	0,00 < alfa ( $\alpha$ ) = 0,05	<b>H<sub>1</sub> is accepted</b>
<b>P-value (pre-test, retention-test) =</b>	0,021 < alfa ( $\alpha$ ) = 0,05	<b>H<sub>1</sub> is accepted</b>
<b>P-value (post-test, retention-test) =</b>	1 > alfa ( $\alpha$ ) = 0,05	<b>H<sub>0</sub> is accepted</b>

**Figure 6.** Results pre-test, post-test y and retention test



## Discussion

Currently, the teaching and learning processes demand the incorporation of different technological tools, since the use of these is increasingly common in people's daily lives. As agents of education, responding to the demands of those who learn becomes a challenge. Therefore, this study focused its purpose on the use of TLK in the motivation to learn phrasal verbs in English.

After applying the activities using the traditional teaching method with phrasal verbs, and later a motivation survey, it was found that in general, the control group showed a result of 36.23% in the total motivation average, taking into account the items of agreement and extremely In agreement, while the experimental group who were subjected to the classes with the TLK, showed a level of motivation of 89.09%, in the same way, the findings of a similar study showed that the use of the application Socrative, as a response system increased significantly the degree of motivation allowing the learning of phrasal verbs in English, Vurdien (2020).

In 2014 Mohammadi and Mirdehghan developed an investigation on the application of combined learning for the teaching of phrasal verbs, the results showed that after having evaluated the phrasal verbs, it is found that there is an improvement in the learning gain, since the findings of this study showed that the post-test scores after the impact of the intervention was significant, which could indicate that gamification improved vocabulary learning in English.

Chaikovska (2022) after carrying out an experiment in which an application was used to analyze the impact of technology to learn phrasal verbs, the results showed that there is a significant improvement in the acquisition of phrasal verbs compared to the previous test, in addition, there was an increase in the autonomy and independence of the students.

Learning was evaluated from 0 to 100 and the following results were obtained: In the control group, there is no significant difference between the scores before and after performing the pre-test and the post-test, as detailed in the results where the average of the pre-test was 53.33 and the post-test was 60 which shows that there is not much difference between one result and another.

However, when we compare the outcomes of the pre and post-tests to the retention test, hypothesis H1 is accepted: Since the test results of retention had an average of 4.89, which does reveal a significant difference between the pre-test results versus the retention test, there is a substantial difference between the test scores before and after applying the retention test.

In the experimental group, H1 is accepted: There is a significant difference between the grades before and after applying the technologies for learning and knowledge (TLK). Therefore, it is concluded that the use of TLK do have significant effects on the results of student learning. Even when we compare the scores of the pre-test whose average score was 51.77 against the average score of the retention test which was 74.67.

But if we compare the post-test scores of 86.15 against the retention test of 76.64, we observe that the results do NOT have such a significant difference, which leads us to infer that the application of the TLK contributes to improving the results and to have a retention of knowledge due to its application.

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