



UTMACH

FACULTAD DE CIENCIAS SOCIALES

**CARRERA DE PEDAGOGÍA DE LOS IDIOMAS NACIONALES Y
EXTRANJEROS**

**SPECIALIZED VOCABULARY DEVELOPMENT THROUGH
THE USE OF THE SPACED REPETITION TECHNIQUE**

**BRAVO PAZMIÑO BRITNEY ABIGAIL
LICENCIADA EN PEDAGOGIA DEL IDIOMA INGLES**

**FRANCO MUÑOZ ANDRES LEONIDAS
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por BRITNEY ABIGAIL BRAVO PAZMIÑO

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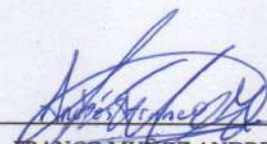
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Dedicatory

I dedicate this degree work to my parents, since they supported me throughout this university journey, my decisions and efforts, to my younger brother, and also to my grandparents who are always there in my thoughts, I could not leave out my three classmates and friends of great support in this path.

Britney Abigail Bravo Pazmiño

I dedicate this work to my parents who never left me alone, as well as those who have helped me through all these semesters.

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I thank my parents, my professors, and also the friends I made in this journey called university since they have helped me to move forward in this chapter of my life.

Andrés Leonidas Franco Muñoz

Resumen

El presente trabajo tiene como finalidad mejorar el vocabulario específico de inglés a través de la elaboración de un sistema de actividades basado en la técnica de repetición espaciada. Se desarrolló desde una perspectiva metodológica de carácter cuantitativo, con un diseño experimental, trabajando con una población compuesta por estudiantes de quinto semestre de la carrera de Psicología Clínica de la Universidad Técnica de Machala. Se consideró el uso de métodos de nivel teórico para la fundamentación del objeto del estudio; así mismo, se aplicaron métodos de nivel empírico y se utilizaron pruebas pedagógicas y rúbricas de evaluación como instrumentos de la investigación. Previamente se hizo el planteamiento de una hipótesis, en donde posterior a la aplicación de la propuesta de intervención, se logró verificar y obtener resultados significativos que superaban a los iniciales en sus indicadores de evaluación, lo que sugiere que esta técnica es especialmente eficaz para lograr una retención duradera.

Palabras claves: técnica de repetición espaciada, vocabulario específico, retención duradera, memoria a largo plazo.

Abstract

The present work aims to improve the specific vocabulary of English by developing a system of activities based on the technique of spaced repetition. It was developed from a quantitative methodological perspective, with an experimental design working with fifth-semester students of the Clinical Psychology career at the Technical University of Machala. During the research, theoretical-level methods were considered; likewise, empirical-level methods pedagogical tests, and evaluation rubrics were used as research instruments. Previously, a hypothesis was formulated, where after the application of the intervention proposal, it was possible to verify and obtain significant results that surpassed the initial ones in their evaluation indicators, which suggests that this technique is highly effective in achieving long-lasting retention.

Keywords: spaced repetition technique, specific vocabulary, lasting retention, long-term memory.

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INTRODUCTION

Learning is considered to be an action that never ends, and languages on the other hand are considered to be a living organism that is constantly evolving. Thus, human beings, historically, since their earliest evolutive stages as a species, could refer to situations or things with a name, and at the same time assign a meaning to them. The results of these modifications are what nowadays is called vocabulary. Since humanity lives in a globalized era, English has become a very desirable language to learn in this regard Moscoso et al. (2019) point out that "se ha difundido de tal manera que el número de hablantes supera al número de sus nativo-hablantes" (p. 97), the importance of mastering an appropriate range of words resides in the need to lay the groundwork on which all the communicative skills of the foreign language will be established and enhanced. Even authors like Sa'D and Rajabi in 2018 emphasized that "vocabulary is believed to be the cornerstone of language courses... is now a current focus in ESL pedagogy and research".

Following this line of reasoning, and considering the significance of English as the language with the highest growth in its use around the world and the necessity of using vocabulary according to specific contexts, that is, language teaching with a purpose as mentioned by Tapia (2018) "by an occupational need or also some academic or professional study" (p. 17), it is recognized that contemporary traditional methods to acquire and memorize the lexis of the new language, may not be fully effective to make them last in the long-term memory of the subject. Research has shown that new words tend to be forgotten if they are not repeated over a day (Raximovna et al., 2020).

To address this problem, scholars have developed a series of techniques to memorize words and put them into practice, one of these is called spaced repetition, which consists of reviewing the content of a study in a given time (Burga, 2018). About this technique, Figueroba (2020), expresses that the German psychologist Ebbinghaus and other later authors observed the ability to remember better if pupils spread their learning over a while instead of doing it several times in a single session. In this way, the knowledge obtained will be distributed in the decreed time and the percentage of information retention will be higher.

In Ecuador, although no investigations have been carried out that broadly address specific vocabulary acquisition techniques as the one previously mentioned, there are studies such as the one conducted by Mejia (2020) that highlighted that:

Teachers at República del Ecuador primary school could use the information given by their students as a way to better understand and be aware of what techniques they prefer for learning vocabulary as well as what techniques they would like the teacher to apply more often in the EFL class (p.50).

That is why, teachers are the ones in charge of adapting their teaching practices used to expand the lexical development of students. In our context, after observing the students from the fifth semester of Clinical Psychology at the Technical University of Machala, the following issues have been identified:

- Reduced proficiency in the number of English words used during the class.
- Difficulty recalling the specific vocabulary learned during class.
- Low ability to communicate and interact with the teacher in the English class.
- Insufficient listening comprehension of the language.

Consequently, it is considered that the aforementioned manifestations are the generalized expression of the need for a lasting vocabulary acquisition, at which point the following scientific problem is formulated: How to improve the acquisition of specific vocabulary of English in fifth-semester students of Clinical Psychology at the Technical University of Machala?

The present investigation has as its object of study the process of vocabulary acquisition in the English language, and the possible causes that lead to the previous scientific question are:

- Lack of motivation leads to refusal to memorize lists of words.
- Limited exposure to the language in their daily life.

Therefore, the general objective is to improve the acquisition of specific vocabulary of English in fifth-semester students of Clinical Psychology at the Technical University of Machala through the development of a system of activities based on the technique of spaced repetition.

Likewise, as specific objectives, the following are pointed out:

- Theoretically supports the acquisition of English language vocabulary.
- Diagnose the current state of vocabulary with respect to their level of English language study.
- Implement an activity system based on the spaced repetition technique.

- Verify the effectiveness of the applied Activities system regarding the improvement of the specific vocabulary of English in fifth-semester students of the Clinical Psychology career at the Technical University of Machala.

This research has a quantitative perspective with an experimental design, aimed at testing the following scientific hypothesis: if an activity system based on the spaced repetition technique is implemented, there will be an improvement in the acquisition of specific English vocabulary in fifth-semester Clinical Psychology students at the Technical University of Machala.

The aforementioned hypothesis considers the correlation between two variables:

The independent Variable: Activities system based on the spaced repetition technique

The dependent Variable: Development of specific English vocabulary.

The research population consisted of fifth-semester Clinical Psychology students at the Technical University of Machala.

Both theoretical and empirical research methods are employed in the study. The historical-logical type of theoretical method was used to establish the trajectory and development of the subject over time, while empirical methods were utilized to validate the hypothesis. Techniques such as surveys, participant observation, and tests for measuring the process are also used.

This research is of paramount importance, in the context of the authors' future teaching practice, because it aims to demonstrate that the use of spaced repetition as a teaching technique promotes the active development of vocabulary, the ability to remember, and even the memorization of both new and previously acquired lexicon by students.

From a practical standpoint, this research provides an Activity system based on spaced repetition as a technique for vocabulary acquisition. The innovation of this study lies in the implementation of an Activity system that ultimately contributes to the fluency of an interactive English class where student participation is not interrupted by a lack of lexical range.

The research report is structured with an introduction that includes its theoretical design. The first chapter presents the theoretical foundations, and the second chapter presents the methodological framework. In response to the difficulties observed in the student's vocabulary acquisition process, the third chapter describes the Activities system that uses the

spaced repetition technique, whose effectiveness after its implementation is described in the fourth chapter. Finally, the conclusions and recommendations are described and supported by the corresponding bibliography.

CHAPTER I
THEORETICAL FRAMEWORK
THEORETICAL BASIS FOR THE ACQUISITION OF ENGLISH
VOCABULARY.

In this chapter, the acquisition of English language vocabulary in the process of teaching and learning in higher education is based on an exhaustive bibliographical review that allowed a historical and conceptual evolution of the topic.

1. Historical evolution of the techniques for the acquisition of specific vocabulary of the English language in the learning process of higher education.

The higher educational institutions we know today have their origins in the intellectual renaissance of the 11th century, centered on philosophy and theology. These schools, mainly cathedrals, offered higher education. The university, as an all-encompassing institution of knowledge, is one of the great creations of Western civilization. Hundreds of universities appeared during the 13th century and by the end of the Medieval Ages, there were about eighty. Over time, the expansion of knowledge reached America, where in the first decade of the 19th century Napoleon created the Imperial University to train intellectuals with practical knowledge useful to society (Chuaqui, 2002).

Considering that the society he referred to was already on the verge of a globalization process which according to Keohane and Nye in 2005 (as cited in Rohbeck 2018) developed mainly since the middle of the 19th century. It became a crucial period for university institutions since as Garrido (2010) emphasized “la intensificación de relaciones mundiales se lleva a cabo principalmente en inglés: la globalización se caracteriza por la hegemonía mundial de la lengua inglesa” (p. 66), therefore the rapid insertion of language was not the exception in the academic context, in which the purpose of foreign language learning was adapted to the needs of society and simultaneously to political, sociological and cultural changes.

During the last years in higher education, it is expected that recent graduates, besides expressing themselves with a certain level of fluency when communicating with other people in the English language, also be able to understand texts that are within their area of knowledge (Uribe 2013), i.e., master an appropriate range of specific vocabulary, which should have been acquired through a corresponding method and tool.

From a historical-pedagogical conception, the development of methods, techniques, processes, and mechanisms used in learning a foreign language is one of the most important aspects of the educational problem. (Sanchez, 2009) In particular, regarding the methods of teaching foreign languages, these begin to emerge at the end of the nineteenth century and present different characteristics, This is because the concept of language and its understanding are taught in very different ways. From a linguistic point of view, not all skills are taught in the same way and with the same emphasis. (Garcia et al., 2017).

Thus, the first teaching method focused on vocabulary that is synthesized below is the "Grammar and Translation" method also known as the "Traditional Method" which was used between the years 1800 to 1900 and applied through the memorization of grammatical rules and vocabulary, here the instructions are given in the mother tongue, therefore, there is little use of the target language. On the other hand, the next method that became popular was the "Direct Method" introduced in France and Germany at the beginning of the 20th century and established in the United States with Sauveneur and Maximilian Berlitz, as they considered that the best way to teach a language is through its active use in the classroom, rather than through analytical procedures centered on the explanation of grammatical rules (Richards & Rodgers, 2001).

Likewise, the "situational method" was developed mainly in Great Britain between the 1930s and 1960s seeking to correct the errors of previous methods, classifying and organizing lexical and grammatical content around real contexts (Martín 2009). And despite the fact that there have been a series of changes in the methods used in the process of teaching and learning English vocabulary, the techniques derived from these have generated great impact over time, as for the latter two are mentioned below that are of great relevance if acquiring lasting vocabulary is concerned, both pointed out by Settles and Meeder(2016) and that are also aligned to the concept of the vocabulary acquisition technique that the authors of this paper have chosen to develop.

- ***The Pimsleur method (1967)***: Pimsleur was probably the first to make widespread practical use of spacing and lag effects, with his audio-based language learning program, he referred to his method as, according to which new vocabulary is introduced and then evaluated exponentially increasing intervals, interspersed with the introduction or review of another vocabulary.

- ***The Leitner system (1972)***: Leitner proposes a different distance repetition algorithm intended for joint use with flashcards. It is more adaptable than Pimsleur in terms of time intervals, which can be increased or decreased depending on the learner's performance in memorizing the vocabulary indicated.

Nowadays, it has been proven that the spaced repetition technique combined with the use of various contemporary resources such as technology for example, either through mobile applications or online platforms, further enhances the acquisition of vocabulary and other skills of the target language. Moreover, recent studies have shown that the use of these contemporary technological tools in conjunction with this technique significantly increases the long-term retention of vocabulary (Karpicke, 2019; Chen, 2018). Even so, facing the constant changes that the world is going through as well as academic innovation, pedagogy is in a permanent state of search for the most appropriate and effective method and technique for learning a foreign language such as English.

1.2. Theoretical characteristics of the process of English language learning in higher education. Vocabulary acquisition techniques.

The following section focuses on the conceptual characteristics that deal with the teaching-learning process of the English language in higher education and emphasizes the terms related to vocabulary acquisition as well as the techniques used for it.

1.2.1 Characteristics of the English language teaching-learning process.

The teaching-learning process is considered complex and interactive, here the teacher provides information and the student receives and processes it. Novoa et al. (2020), point out that it is also based on an active process where the student constructs his or her knowledge, the instructors adapt their teaching practices to the needs and individual characteristics of each student, and use techniques that encourage active participation as well as the development of skills. The learning of a second language is no different from the reasoning just mentioned above, and it should even be added that young people and adults perceive it as a necessity. According to Garcia (2007), the acquisition and mastery of the English language are very desirable. For example, a study carried out in Spain revealed that almost 30% of employees requested language instruction, and English was the most demanded language to learn.

However, despite its relevance in various fields, the acquisition and mastery of this language is not an easy road to travel because according to Rocoy and Alvarez (2016), the main obstacles encountered in learning a foreign language tackle with inadequate forms and methods of teaching. Although there are many of the latter, it is not common to use those that are innovative or attractive to students.

On the other hand, Madrid (2001) points out that “en contextos de aula los medios y recursos didácticos que emplean profesores y alumnos para la enseñanza y aprendizaje son de vital importancia porque condicionan la eficacia del programa didáctico y el aprendizaje que experimenta el alumnado”. According to the author, when using the materials, it should be taken into account that the foreign language is not only a system of forms, structures, and words, but also, in practical terms, a system of communicative acts, and it is expected that the means used will facilitate the development of this ability in the student. For this purpose, a wide range of visual and auditory resources have been employed such as:

- The textbooks, reference books, activity books, etc.
- The language laboratory or multimedia room: projections, videos, computer programs, internet, etc.
- Magazines and newspapers: articles, abstracts, news, reports, advertisements, flowcharts, murals, etc.
- Realia: real or miniature objects, coupons, tickets, brochures, advertisements, photos of posters, clippings, and flashcards.
- Visits and excursions: contact with native English teachers as far as possible.

An indispensable part of the English language teaching-learning process is being in constant evaluation, where diverse means are used to gather information about what, how much, and how well the process is being carried out. This information contributes to the constant improvement of the methodology and strategies used (Navia, B. & Rodriguez, A., n.d.). Regarding English language assessment strategies, the findings provided in the work carried out by de De Jesus (2014) after a series of interviews, the five most predominant and common ones were brought up, which are: the use of exams and quizzes, review of assignments, exercises, and students participation.

1.2.2 Vocabulary development in the English language.

As expressed by Nation and Waring (2008), vocabulary is the set of words and expressions that a person knows and uses in a language or a specific context; it is essential for effective communication and cognitive development since it allows understanding and expressing complex ideas. Vocabulary refers not only to individual words but also to the grammatical structures and patterns of expression that make it possible to construct complex and coherent sentences.

Alternatively, Fang (2018) highlighting the origin of vocabulary, considers vocabulary development to be a continuous process that begins at birth and extends throughout life, i.e., it expands rapidly during the first years of life and continues to develop as the individual acquires new skills and experiences. Vocabulary development also depends on exposure and stimulation, i.e., access to a current and varied lexicon. Exposure to rich texts, both at home and at school, is critical to its development. Likewise, Chen (2018) stipulates that explicit vocabulary teaching, such as the presentation of new words and their use in meaningful contexts, are effective strategies for enhancing its development.

This same idea is replicated by Vega Iza et al. (2022), who state that vocabulary development is a crucial aspect of English language learning, as it allows us to communicate effectively and understand the world around us. In addition, it is mentioned that vocabulary development in the English language can improve academic performance and cognitive development.

From the point of view of Guarin (2018) vocabulary is divided into two types: active vocabulary and passive vocabulary. The former refers to words that are used habitually in speech or writing, while passive vocabulary encompasses those words in the target language that are known but not used daily. The development of both is essential and complements language proficiency. This author also classifies vocabulary according to its degree of difficulty and specialization: basic vocabulary is considered necessary for effective communication in a language, while specialized vocabulary includes words related to a specific thematic field, such as medicine, information technology, and economics, among others.

After the different conceptions of vocabulary previously presented, this research assumes the criteria of Nation and Waring when defining it as the conglomerate not only of

words but also of structured ideas that make effective communication possible; however, it also adopts the position of the author Guarin when considering the development of vocabulary not as an isolated process, but as the systematic creation of the lexicon taking into account its specific context and emphasizing the classification of vocabulary as specialized.

Since this work supports the search for the acquisition of contextualized vocabulary, where the student can develop it through his mental processes, but which also remains in his long-term memory, reference is made to a pedagogical model that is aligned to this objective and to the technique that is intended to be used to achieve it, part of the cognitivist model proposed by Piaget (1982).

This model focuses on how the student knows the external world through the senses, always in the evolutionary perspective of the mental process and its complex cognitive skills. This cognitive development demands the construction of mental schemes, where the encounter of previous knowledge and new knowledge takes place (Altez Ortiz et al., 2021).

According to this line of reasoning, and in terms of the bases of the aforementioned pedagogical school, the "spaced repetition technique" appears as a specific vocabulary teaching strategy that consists of scheduling the review of words at a given time interval, to promote long-term retention. According to Kang's research in 2018, this technique is more effective than mass repetition in a short period, as it allows the brain to process and store the information in long-term memory thus matching the two factors that Marzano and Pickering (2005) consider crucial for vocabulary learning which are: "(1) the ability of the student to process and store information; and (2) the regularity with which a student goes through academically-oriented experiences".

This technique is also based on a theory of memory, proposed by Ebbinghaus, which holds that information is forgotten quickly at first and then decreases more slowly as time passes. The goal of the spaced repetition technique is to take advantage of this pattern of forgetting by scheduling increasingly spaced reviews as the learner gets used to the word and retains it better (Cepeda, 2018).

It can be applied in different ways, either through flashcards or language learning applications that automatically schedule revisions. However, it should be considered that as Nation and Waring 2008 point out "Learning from lists or word cards is only a stage of

learning a particular word. It is however a learning tool to use at any level of vocabulary proficiency" giving greater prominence to the technique over the tools used. The versatility of this is also highlighted as it can be combined with other teaching strategies to enhance specific vocabulary development such as teaching words in context and teaching synonyms and antonyms (Fang, 2018).

1.3 Contextual characterization of the English language learning process in tertiary education and vocabulary acquisition techniques.

This section presents the contextual characteristics of the field and the object from the general to the particular, as well as the diagnosis of the vocabulary level presented by the students.

1.3.1 Contextual characteristics of the English language learning process in tertiary education and vocabulary acquisition techniques.

English occupies an important place in today's society in several scientific and technological fields, and learning this language is very valuable; for this reason, Ecuador has implemented several modifications in its educational policies to align itself with the needs of the globalized world. To carry out the language teaching process, the factors that concern language learning must be taken into account, in addition, different methods and cultural aspects surrounding this language need to be included. (Peña-Ledesma, 2017).

The teaching of this language at the local level has experienced a significant evolution over time. From its inclusion in schools as an optional subject to its current status as a global language and essential for communication in the modern world, the approach to teaching English has changed and adapted to the demands of society. This corroborates the fact that Vega Iza et al. (2022) highlight that "governmental efforts at the national level have spanned several years and have attempted to push for an entirely new composition in English language education."

The first laws for the management of the educational system were passed between 1930 and 1940, but the teaching of English as a foreign language was not included in the curricula. In the early 1970s, the focus was on reducing illiteracy, but in the late 1980s, when there was an external debt crisis, public spending on education decreased drastically, causing

an increase in student dropout and a lack of attention to rural education (Villafuerte Holguin, 2019).

In the private education system, the constructivist model for teaching English was adopted in the 1990s. The English subject was offered with a 5-hour per week load from preschool through high school, although in some bilingual centers, a 20-hour per week load was offered, with subjects taught in English such as Social Studies, Natural Environment Sciences, and Computer Science, among others. Families also invested in English texts and educational technology (Villafuerte Holguin, 2019).

Years later, the subject of English was incorporated into the public secondary education curriculum in Ecuador. The approach used in teaching was the traditional grammatical one, with an hourly load that varied between one and three hours per week. The Curriculum Development Language English (CRADLE) program was implemented between 1992 and 1998 to innovate and strengthen the teaching of English and improve the educational infrastructure. This program focused on Quito, the capital of the country (Villafuerte Holguin, 2019).

Therefore, the National Government has been focused on improving the quality of education in all areas since the meeting in Dakar in 2000. After this meeting, the country committed to participate in the "Education for All" plan. In our country, the objectives of this commitment have been institutionalized in the "Ten-Year Plan 2005-2015", which includes eight educational policies and several objectives. Objective number four states that citizens' skills should be increased, so curricular changes were made (Peña Ledesma, 2019).

One of the most significant was in 2011 with the update of the Curricular Reform, which made transformations in the structure of subjects in all subjects and started with the project "It is time to teach English". This project sought to improve the system of teaching English as a foreign language, considering aspects of methodology and teacher training. In addition, in agreement 0041-14, English was made part of the formal curriculum with a 5-hour load starting in the eighth year of primary education. With this, the aim was to improve the level of language skills of students through teacher training in this area (Peña Ledesma, 2019).

From 2015, the teaching of English was regulated in all public educational institutions in Ecuador from the 2nd year of basic education until the end of secondary education. This regulation establishes the goal that students complete secondary education with a knowledge of English at the B1 level according to the Common European Framework of Reference (Villafuerte Holguin, 2019). In the next year, the Council of Higher Education established that university students must have an upper-intermediate level (B2) in English, assessed before their final year of studies, according to the Common European Framework (Peña Ledesma, 2019).

In addition, there is a public policy related to the continuous improvement and training of English teachers throughout the country. However, it is necessary to design and validate practical didactics to achieve the established objectives, which offers an opportunity for educational research to contribute to improving English language learning in Ecuador (Villafuerte Holguin, 2019).

1.3.2 Diagnosis of the current state of the management of specific vocabulary of the English language in the fifth semester students of the Clinical Psychology career of the Technical University of Machala.

This sub-epigraph shows the results obtained from the pre-test carried out diagnosing the current state of the management of specific vocabulary of the English language in the students of the fifth semester of clinical psychology of the "Universidad Técnica de Machala (UTMACH)" in the academic period 2023-1. The instruments used for data collection are the observation guide, the semi-structured interview with the teacher, and the pedagogical test.

Analysis of results

The first instrument applied was the Observation Guide, which allowed us to demonstrate the following results:

- Students have problems with the active use of specific English vocabulary, that is when answering questions regarding the topic asked by the teacher.
- Most of the students can understand through context or similarity of sound to Spanish the words referring to the specific vocabulary of the topic presented; however, they are afraid to participate.

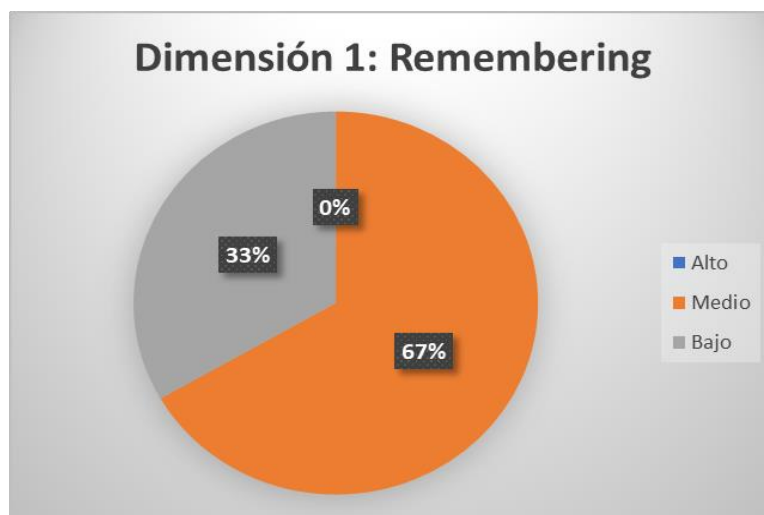
- The students find it difficult to follow the readings that use the specific vocabulary of the topic covered in the class and consequently, they limit themselves to expanding their vocabulary by using synonyms or related words.
- Although there were no complex written expression activities, it was noted that only some of the students were able to write a sentence with a basic structure that included specific vocabulary in English.

The second instrument used was a semi-structured interview, directed to the teacher of the technical English course, focused on getting to know his point of view about the state of the specific vocabulary of the students and his methodology for its evaluation, obtaining the following information:

- According to the teacher, the general vocabulary level of the students in his subject is very basic since it is the only semester throughout their career in which they receive the subject of technical English.
- About the techniques used by the teacher to teach and reinforce the specific vocabulary of the students, some were mentioned such as the use of definitions and synonyms, "realia", "context by sentences", images, and interactive audiovisuals.
- It was also mentioned that the progress of vocabulary acquisition is monitored through written lessons per unit, but the teacher measures their improvement based on their participation in class.
- The teacher was asked about a specific trend in vocabulary that students tend to have more difficulty with, to which he mentioned topics such as "proper nouns" referring to specific names of psychological illnesses that are learned in the subject.
- Regarding their ability to remember the previous topic when reviewing it and the vocabulary used, the teacher commented that it is not easy for them to "recall" so they must use some method to bring back to their memories what they have been taught.

As a last instrument, a pedagogical test was applied to know the state of the specific vocabulary in English of the students in the fifth semester of the clinical psychology career at the Technical University of Machala. The analysis of the results obtained based on the selected dimensions and later in an integrated manner is presented below.

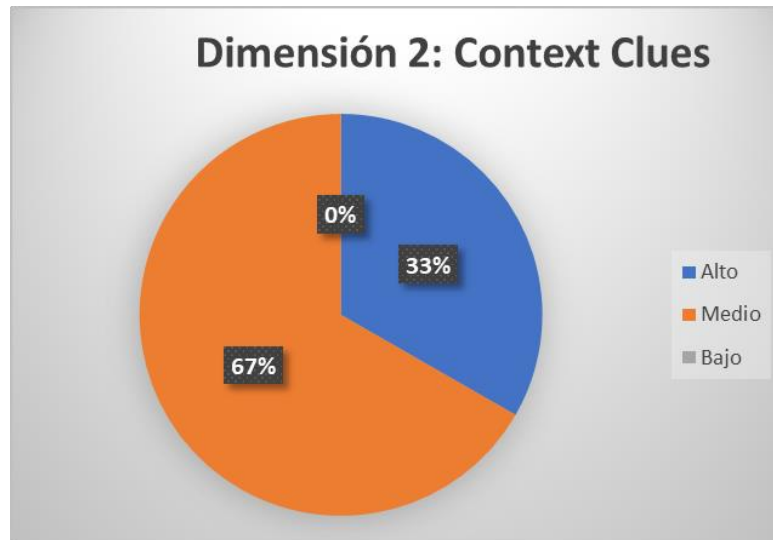
Indicator: Remembering



Remembering is a fundamental concept in the process of acquiring and mastering English vocabulary. It refers to the ability to remember and recall words and expressions at the appropriate time to use them effectively in communication. As noted by language teaching expert Paul Nation in his work "Teaching ESL/EFL Listening and Speaking" (2018), "remembering is essential for achieving fluency and communicative competence in a second language" (Nation, 2018).

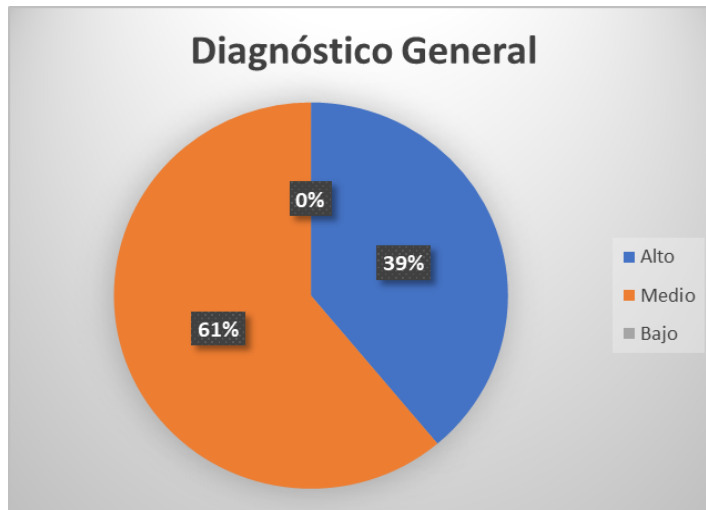
Having mentioned this, with the results obtained, it is evident the existence of a deficit in the vocabulary that the students possess regarding their specialization, although this cannot be generalized for all students, more than half of these presented a Medium (M) domain referring to the technical lexicon.

Indicator: Context clues



"Guessing meaning by context" is a fundamental concept in English vocabulary learning and comprehension. It refers to the ability to infer the meaning of an unknown word from the context in which it is found. When encountering a new word, we can analyze surrounding words, phrases, and the overall situation to deduce its possible meaning. As David Crystal noted in his 2018 book *The Cambridge Encyclopedia of the English Language*, "Context is a powerful tool that allows us to make sense of words that would otherwise be unfamiliar to us" (p. 127). By using context as a cue, students can expand their vocabulary and develop their ability to comprehend English texts more effectively.

With this in mind, it was evident from the data collected that, although there is no deficit in this dimension, it is still difficult for students to identify meanings with the help of the context surrounding the word; also, one-third of the students present a High (A) level in the mastery of this dimension.

General diagnosis:

Through all the graphs presented, it can be summarized that although there is a difficulty for the students, there is a Medium (M) domain in general terms on the part of the students, in addition to the fact that there are students who have a High (A) domain of the diagnosis, although this is only a little more than a third of them.

It was concluded that with the use of the pre-test instrument, the students' mastery of the vocabulary in the different dimensions diagnosed was demonstrated, therefore these results justify the need to act in the pedagogical practice through a system of activities based on the use of the spaced repetition technique for the development of specific vocabulary in the students of the fifth semester of the clinical psychology career of the Technical University of Machala (UTMACH).

CHAPTER 2. METHODOLOGICAL FRAMEWORK

This chapter presents the methodological framework and its components such as the methodological perspective, type of research, and population, as well as the description of the different methods and techniques that will be used to obtain the necessary information about the development of the previously stated objectives.

2.1 Research design

The research carried out in this degree project is based on a quantitative paradigm through which we seek to observe, measure, and manipulate the variables that are present in the study phenomenon to collect and analyze statistical data that will validate or refute the established scientific hypothesis.

In addition, the work is approached from an explanatory level since in accordance with what Sampieri (2010) mentions “Los estudios explicativos van más allá de la descripción de conceptos o fenómenos o del establecimiento de relaciones entre conceptos; están dirigidos a responder a las causas de los eventos físicos o sociales.”

Concerning the selected paradigm and the characteristics of the research problem, the research is of an experimental type structured under a pre-experimental design, since it agrees with Galarza (2021) when he mentions in his study that the dependent variable of the research will be measured twice: before and after the intervention through a pre-test and a post-test.

2.2 Population

Likewise, the use of a sample is discarded since we will work with the complete population, regarding this, Ventura (2017) in his research defines it as “un conjunto de elementos que contienen ciertas características que se pretenden estudiar”, so that in this work the 18 students of the fifth semester parallel "A" of the career of clinical psychology with the subject "Technical English" of the Technical University of Machala are used as subjects of study.

2.3 Research Methods

This section describes the methods used to carry out the research, both theoretical and empirical nature for the formation of the theory, as well as the collection and analysis of data analysis.

The following methods were used:

Theoretical level methods

Theoretical methods, as alleged by Jimenez and Perez in 2017 allow processing of the results obtained through empirical methods, ordering them, analyzing them, explaining them, finding similarities, and reaching reliable conclusions that allow solving the problem, among the variety of existing theoretical methods it is decided to use the following:

- **The historical and logical method**

The historical-logical method as mentioned by Torres (2020) in his study, is used to register a coherent advance of the past facts of the research topic to contribute to the formation of theories about the history of the same. I think it is necessary to relate it to our research.

- **The hypothetic-deductive method**

The hypothetic-deductive method is based on the formulation of a hypothesis, which can be deduced from principles, laws, theories, or empirical data. The logical rules of deduction are then applied to test the veracity of the hypothesis. This method involves the demonstration or derivation of one or more statements. It is highly valuable in heuristic terms since it allows anticipating and verifying new hypotheses about reality, as well as inferring conclusions and making predictions based on existing knowledge (López & Ramos, 2021).

- **The analytic-synthetic method**

The analytical-synthetic method consists of breaking down the complex into parts and qualities through analysis, and then uniting those parts and discovering the general relationships through synthesis. Both processes must occur consciously and closely related in the investigation. This method combines the thorough and detailed analysis of the constituent parts of a problem, and the synthesis is based on the previous results of the

analysis, to obtain a global and coherent view of the problem, although one of them may predominate at different stages of the research process (López & Ramos, 2021).

- **Systemic method**

The systemic method seeks to understand the phenomena studied as complex and interconnected systems. According to Salas-Zapata et al. (2019), this method allows for addressing complex problems, identifying causal relationships, and analyzing long-term effects.

Furthermore, Silva et al. (2020) highlight that the systemic method facilitates the integration of different disciplines and approaches, thus fostering a more complete understanding of the phenomena studied.

Empirical level methods

Concerning the methods used at the empirical level, it was decided to consider measurement and observation as fundamental methods, together with the pedagogical test as a technique, as well as the interview.

- **Observation**

Scientific observation is a method by which information is provided directly to the researcher by observing the object or phenomenon under study. In fact, according to Diaz (2011), much of the body of knowledge that constitutes science has been achieved through observation.

- **Measurement**

According to a study by Smith and Jones (2018), "la precisión y exactitud de las mediciones son esenciales para garantizar la validez de los resultados de la investigación". In this sense, the implementation of high-tech instruments has made it possible to minimize errors and increase the quality of the data obtained.

In addition, measurement has also been instrumental in the development of new fields of research. A study published by Johnson et al. in 2019 highlighted that the measurement of

specific variables in the field of genetics have been crucial to better understanding inherited diseases and advancing the design of more effective treatments.

Pedagogical test

Regarding these authors such as García-Valcárcel, A., Gairín, J., & Rodríguez-Gómez, G. (2020) refer to pedagogical evidence as "la evaluación sistemática de intervenciones educativas con el fin de determinar su eficacia y su impacto en el aprendizaje de los estudiantes". This involves rigorous data collection and analysis using research methods to establish the relationship between pedagogical practices and educational outcomes.

Interview

The research interview allows valuable and richly detailed information to be obtained directly from participants. Its ability to capture the subjectivity and diversity of human experiences makes it a powerful tool for exploring complex phenomena and understanding reality from diverse perspectives. According to Houser (2018), "interviewing is especially useful when trying to obtain subjective and detail-rich information that cannot be obtained through quantitative methods."

This research considers "Vocabulary development" as the variable under study, for which the following consistency matrix was elaborated:

| Scientific problem | Objectives | Hypothesis | Variables de investigación | Indicadores de medición | Items |
|--|---|--|--|--|---------------------------------------|
| How to improve the acquisition of specific vocabulary of English in fifth-semester students of Clinical Psychology | General: to improve the acquisition of specific vocabulary of English in fifth- | General hypothesis: if an activity system based on the spaced repetition | 1. Development of Specific English Vocabulary: This pertains to the aggregate of | The quantity of words within the student's lexicon. (Amount of | Identifies the context of word usage. |

| | | | | | |
|--|---|--|--|--|---|
| <p>at the Technical University of Machala?</p> | <p>semester students of Clinical Psychology at the Technical University of Machala through the development of a system of activities based on the technique of spaced repetition.</p> | <p>technique is implemented, there will be an improvement in the acquisition of specific English vocabulary in fifth-semester Clinical Psychology students at the Technical University of Machala.</p> | <p>words and expressions that an individual possesses knowledge of and employs within a given language or particular context. It is indispensable for effective communication and cognitive advancement, as it facilitates the comprehension and articulation of intricate ideas (Nation and Waring, 2008).</p> <p>Independent</p> <p>2. Activity System Based on the Spaced Repetition Technique.</p> | <p>previous words on their list)</p> <p>Words identified by context</p> <p>The words retained in memory. (Remembering)</p> | <p>Retains the list of acquired words.</p> <p>Utilizes the words.</p> |
|--|---|--|--|--|---|

Table 1 Consistency matrix. Prepared by the authors.

| Indicator | Analysis |
|-----------|----------|
|-----------|----------|

| | |
|--|---|
| <p>Remembering previous activity system</p> <p>The quantity of words known by the student prior to the implementation of the activity system.</p> | <p>High (4) The student recognizes all the words.</p> <p>Medium (3) The student recognizes three words.</p> <p>Low (0-2) The student does not recognize any or only two words.</p> |
| <p>Indicator</p> | <p>Analysis</p> |
| <p>Context clues</p> <p>Words identified by context</p> | <p>High (4) The student identifies all the words.</p> <p>Medium (3) The student identifies three words.</p> <p>Low (0-2) The student does not identify any or only two words.</p> |

Table 2 Indicators matrix (Pre-test). Prepared by the authors.

| | |
|--|---|
| <p>Indicator</p> | <p>Analysis</p> |
| <p>Remembering after AS</p> <p>Retention of words recalled after the activity system.</p> | <p>High (6-7) The student recognizes six or seven words.</p> <p>Medium (4-5) The student recognizes four or five words.</p> <p>Low (0-3) The student does not recognize any or only three words.</p> |
| <p>Indicator</p> | <p>Analysis</p> |

| | |
|--|---|
| <p>Context clues</p> <p>Words identified by context</p> | <p>High (4)</p> <p>The student identifies all the words.</p> <p>Medium (3)</p> <p>The student identifies three words.</p> <p>Low (0-2)</p> <p>The student does not identify any or only two words.</p> |
|--|---|

Table 3 Indicators matrix (Post-test). Prepared by the authors.

In the chapter, the methodological design of the research was expounded, with particular emphasis placed upon the selection of the population, typology, and methodologies employed to address the research problem.

CHAPTER 3. SYSTEM OF ACTIVITIES BASED ON THE TECHNIQUE OF SPACED REPETITION FOR THE DEVELOPMENT OF THE SPECIFIC VOCABULARY OF ENGLISH.

In this chapter, the activity system applied to the research subjects is substantiated, along with its execution, accompanied by its respective planning as demonstrated in the progression of each of the designed classes.

3.1 Theoretical justification of the system of activities based on the technique of spaced repetition.

An activity System is an educational methodology that has been approached from different perspectives by different authors. According to Brown and Lee (2018), this approach focuses on carrying out practical tasks and projects that allow students to interact with the content actively, applying knowledge in real and meaningful situations. According to their view, this approach motivates students and promotes more in-depth and long-lasting learning.

Likewise, Johnson and Smith (2018) emphasize the importance of integrating an activity System into the language curriculum. According to them, by including activities that simulate real English communication situations, students develop practical language skills and feel more engaged in the learning process. In the area of English vocabulary acquisition, the Activity System has proven to be an effective tool. A study by White et al. (2018) found that students who participated in communicative and meaningful activities to learn new vocabulary showed greater retention and effective use of learned words in comparison to those who simply memorized isolated word lists.

The combination between an activity System with the Spaced Repetition Technique has led to even more promising results in English vocabulary acquisition. According to Lee and Johnson (2018), the Spaced Repetition Technique is based on the periodic, scheduled presentation of vocabulary at increasingly longer intervals. This spaced repetition helps strengthen neural connections related to learning and prevents rapid forgetting.

The study by Kim et al. (2018) evidenced the effectiveness of this combination. By using the Activity System to teach English vocabulary and then reinforcing it with the Spaced Repetition Technique, students achieved stronger acquisition and long-term retention of the

learned words. Furthermore, with what has already been mentioned above, the combination of these two strategies, as noted by Johnson et al. (2018), offers a comprehensive and powerful approach to English-specific vocabulary acquisition. Learners benefit from active participation in meaningful activities and spaced repetition to consolidate and strengthen their linguistic knowledge.

According to Brown and Lee (2018), one of the main goals of an Activity System is to foster active and participatory learning. Through the completion of meaningful hands-on tasks and projects, students are actively involved in the knowledge acquisition process, which promotes deeper understanding and greater retention.

On the other hand, Johnson and Smith (2018) emphasize the goal of improving fluency and communicative ability in the target language. By incorporating activities that simulate real communication situations, students have the opportunity to practice and apply new content in an authentic way, which contributes to developing their practical language skills. Another objective identified by Larson-Freeman (2018) is to foster learner autonomy in the learning process. Through the Activity System, students take a more active role in their education, making decisions and managing their learning, resulting in a greater sense of responsibility and empowerment.

The combination of these objectives enriches the Activity System. Fostering active and participatory learning, improving communicative fluency, and promoting student autonomy are interconnected goals that complement each other to achieve comprehensive and meaningful learning.

3.2 Description of the activity system.

An Activity system using the Spaced Repetition Technique (SRE) is based on periodic and scheduled presentation of information, optimizing retention and minimizing forgetting (Lee and Kim, 2018). A Systemic Character in SRE involves the use of organized algorithms and systems to determine when and how often to review content to maximize learning.

The proposed Activity System is an educational approach that seeks to integrate learning in a meaningful and motivating context. Concerning these, over time, different

authors have proposed different stages or phases that characterize this system, providing a complete vision of the teaching-learning process.

Regarding the stages of the same, the authors Johnson and Smith (2018) propose four of them: presentation, practice, production, and evaluation. In the presentation stage, new content or vocabulary is introduced. Then, in the practice stage, learners participate in interactive activities to practice and entrench knowledge. Next, in the production stage, students use the new content in more authentic situations, such as discussions or projects. Finally, in the assessment stage, a review is conducted to measure students' progress and understanding.

The use of learning technologies according to Chen et al. (2018), is one of the fundamental means in an Activity System with SRE. These tools allow scheduling and managing spaced repetition more efficiently, ensuring proper distribution of learning material and adjusting to the individual needs of students. On the other hand, Kim and Lee (2018) highlight the importance of multimedia content in the Activity System. The incorporation of images, videos, and audio in the activities enriches the learning experience and facilitates memorization and retention of specific vocabulary.

In addition, the adaptability of SRE in the Activity System is highlighted by Lin and Wang (2018). They point out that the ability to customize repetition intervals according to the perceived difficulty or progress of the learner is an essential means to ensure that learning is effective and meaningful.

The combination of these media enriches somehow the Activity System that is based on the Spaced Repetition Technique. The use of learning technologies, multimedia content, and the adaptability of the SRE allow for personalized, effective, and long-lasting learning. According to Larson-Freeman (2018), when students are engaged in sequentially structured activities, they are provided with a learning experience in which they can build and connect knowledge in a meaningful way.

Likewise, a system of activities is presented aimed to improve the range of specific English vocabulary through dynamic activities, which are directly related with the memorization of the list of words presented in the first approach with the students; thus

corroborating what is established by the technique of spaced repetition applied with a systemic character, which refers to the organized and structured nature with which educational activities are designed and coordinated. According to Smith and Johnson (2018), a system of activities with a systemic character implies a careful selection of tasks and projects, establishing meaningful connections between them, so that students can experience a coherent and progressive learning process.

Activity No. 1

Theme: Mental Disorders

Objective: Students will be able to recognize the word list related to mental disorders by using topics in context.

Time: 25 minutes

Introduction to the Topic (6 minutes)

Brainstorming: Brainstorming of words related to mental health, from which a word list will be established and evaluated at the end of the activity system.

Explanation of the Activity (9 minutes)

Introduction of Basic Vocabulary: Presentation and explanation of fundamental terms related to the specific class topic, which will be taught by the teacher, "eating disorders."

Association Activity: Vocabulary card game.

Assessment (5 minutes)

To conclude the activity, there will be interactive participation from students, where 2 students will be asked to use the learned words in contextualized sentences as a timed competition.

Random game of "hot potato" where 3 students mention one of the learned words.

Finally, the teacher takes over to start the class.

Resources:

Markers: Used for brainstorming and sentences.

Flashcards: These will have the word to be learned and its Spanish translation on the reverse side.

Activity No. 2

Theme: Social Anxiety, Panic Disorder, and Memory

Objective: Students will recall the previously learned word list related to mental disorders and introduce new specific vocabulary by using topics in context.

Time: 25 minutes

Introduction to the Topic (8 minutes)

Psychology Trivia: Psychology questions, as well as interesting facts about it.

Recall: Verify if students remember the word list presented the previous week.

Brainstorming: Association of words with the topics to be covered that day (Memory, Social Anxiety, and Panic Disorder), expanding the word list established in the previous class, which will be evaluated at the end of the activity system.

Explanation of the Activity (10 minutes)

Basic Vocabulary: Presentation using vocabulary cards and explanation of fundamental terms related to the specific class topic, taught by the teacher:

"Social anxiety"

"Panic Disorder"

"Memory"

Conclusion (7 minutes)

A random number game is chosen by the teacher for students to mention one of the learned words and its Spanish translation. Then, students will form sentences using the presented vocabulary.

Finally, the teacher takes over to start the class.

Resources:

Markers: Used for word association and sentences.

Flashcards: These will have the word to be learned and its Spanish translation on the reverse side.

Activity No. 3

Theme: Memory and Learning Process

Objective: Students will recall the previously learned word list related to mental disorders and introduce new specific vocabulary by using topics in context.

Time: 25 minutes

Introduction to the Topic (8 minutes)

Recall: Remember the word list presented the previous week, including the additions.

Brainstorming: Questions about historical events and dates to reference the use of memory.

Explanation of the Activity (12 minutes)

Introduction of new words related to the topic "Memory and learning process": Cognitive, to store, retain, long-term/short-term, sensory.

"Bingo game" of the presented vocabulary.

"Describing a picture" using the vocabulary of the presented topic.

Conclusion (5 minutes)

Group activity "Snowstorm," where students write down the most challenging words on crumpled papers, toss them in the air, and another student has to pick one and translate it within 10 seconds.

Finally, the teacher takes over to start the class.

Resources:

Markers: Used for word association and sentences.

Flashcards: These will have the word to be learned and its Spanish translation on the reverse side.

Piece of paper.

Activity No. 4

Theme: Learning Styles

Objective: To assess the words introduced throughout all the activities that were given.

Time: 25 minutes

Introduction to the Topic (8 minutes)

Recall: Remember the word list presented the previous week, including the additions.

Brainstorming: "Tic Tac Toe" game to introduce the class topic.

Explanation of the Activity (10 minutes)

Introduction of new words related to the topic "Learning styles."

Presentation of students' learning styles and "What am I?" game related to the topic.

"Hangman" activity to present vocabulary by having students guess the correct spelling of words.

Conclusion (7 minutes)

"Name three" - Students have a short time to name three words from the categories of the presented topics so far.

Finally, the teacher takes over to start the class.

Resources:

Markers: Used for word association and sentences.

Flashcards: These will have the word to be learned and its Spanish translation on the reverse side.

At the end of the system of activities in accordance with the main purpose of the spaced repetition technique, its effectiveness is evaluated through an online post-test based on two of the previously mentioned indicators, to verify which and how many words from the list of the specific vocabulary that was created are remembered after having gone through 4 time intervals.

This chapter presents an activity system for the development of specific vocabulary based on the use of the spaced repetition technique in a system of activities. Subsequently, the results of its application in the context of fifth-semester students of Clinical Psychology at the Technical University of Machala are presented.

CHAPTER 4. APPLICATION OF THE SYSTEM OF ACTIVITIES TO IMPROVE THE SPECIFIC VOCABULARY OF ENGLISH BASED ON THE SPACED REPETITION TECHNIQUE

This chapter shows the results obtained from the application of the system of activities to improve the specific vocabulary of English in the fifth semester students of the Clinical Psychology course at the Technical University of Machala during the 2023-1 school year, carried out on July 18, July 25, August 8 and August 15 through the experimental design.

4.1 Description of the application of the system of activities based on the spaced repetition technique

To evaluate the effectiveness of the use of spaced repetition as a didactic technique to improve the specific vocabulary of English in fifth-semester students of Clinical Psychology at the Technical University of Machala, it was necessary to apply a system of activities. The application of these activities will be described below:

Week 1: Mental disorders

The first week of the application of this system of activities was carried out on July 18, starting at 7:30 a.m. with the participation of all the students of the class, this system of activities was thought as a way of introduction for the class coming by the teacher in charge, beginning with a "warmer" activity to gain the attention of the students with brainstorming on the whiteboard, Introducing the vocabulary related to the topic of "mental disorders" was presented with a list of words related to clinical psychology in general and another one with specific terms through flashcards, and finally another playful activity was used for the students to practice the contextualized use of the lexical set presented, to then give way to the teacher's class.

Week 2: Social Anxiety, Panic Disorder, and Memory

The second week of the application of this system of activities was carried out on July 25, starting at 7:30 a.m. with the participation of all the students of the course: 30am with the participation of all the students of the course, this system of activities was thought as an introduction for the classes of the teacher in charge, starting with a warmer activity to gain the attention of the students with a word association, after this the vocabulary related to the topic of social anxiety was shown, panic disorder and memory with the list of words related

to the topic in general that was already presented and another with specific terms of each topic with the use of flashcards, to finish with another activity for students to practice the correct use and meaning of the lexical set presented, and then give way to the teacher's class.

Week 3:Memory and learning process

The third week of the application of this system of activities was carried out on August 8, starting at 7:30 a.m. with the participation of all the students of the class, this system of activities was thought to be an introduction to the classes of the teacher in charge. It started with a warmer activity and recalling the information presented last week. After this, the vocabulary related to the topic of memory and learning process was presented with a list of words related to the topic in general and another one with specific terms of each topic with the use of flashcards as well as the use of a bingo game for a better association of the words exposed, Finally, another activity called snowstorm was used for the students to better remember the meaning through the movement and use of the lexical set presented, and then give way to the teacher's class.

Week 4: Learning styles

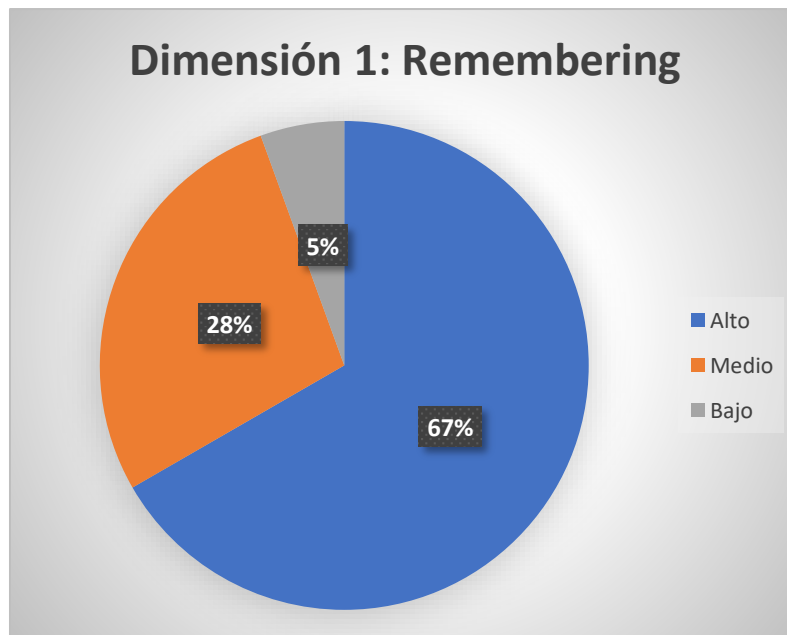
The fourth and last week of the application of this system of activities was carried out on August 15, starting at 7:30 a.m. with the participation of all the students of the class, this system of activities was thought to be an introduction for the teacher's classes. Beginning with a warmer activity to gain the attention of the students with the use of tic tac toe which was used to introduce the topic, after this, the vocabulary related to the topic of learning styles was presented as well as the use of hangman game to show the correct spelling of this, all this with the use of a list of words related to the topic in general and another with specific terms of each topic with the use of flashcards, to finish, another activity was used as names three so that the students could correctly associate the meaning and correct use of said lexical set presented, and then give way to the teacher's class.

4.2 Results obtained after the use of the activity system based on the spaced repetition technique.

The data obtained in the pre-test were a clear indicator of the need for the application of the proposed activity system, which was composed of several activities that allow a better

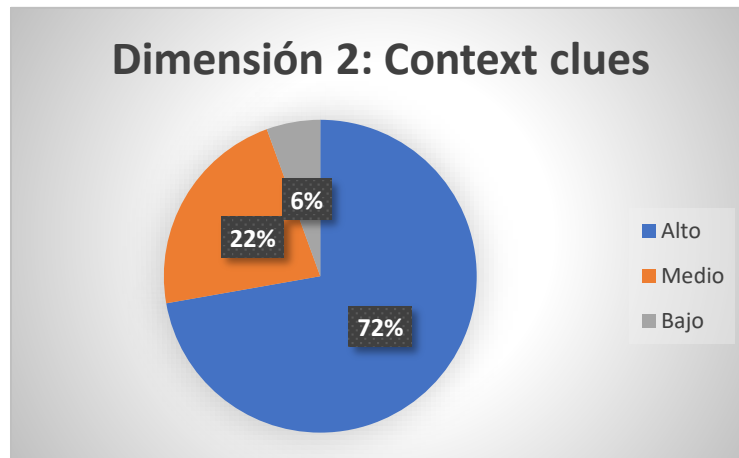
acquisition of specific vocabulary using spaced repetition as the application technique. The results of both the pre-test and the post-test applied were obtained and compared by means of empirical methods using rubrics with measurement scales. As with the pre-test, dimensions processing specific vocabulary acquisition were used to test the hypothesis, obtaining the following data:

Dimension 1: Remembering After the AS



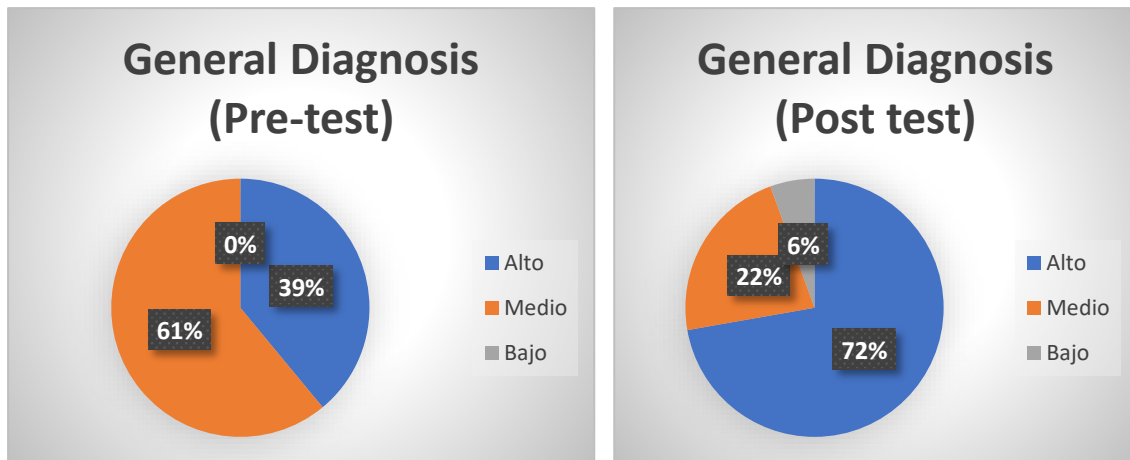
In this dimension, there is a remarkable improvement in which the number of students with low performance (B) in the aforementioned dimension was reduced, as well as those with medium performance (M) and also increased the high performance (A), which demonstrates the effectiveness of the implementation of the system of activities.

Dimension 2: Context clues



In the "context clues" dimension, a substantial improvement of the High (A) and Medium (M) level is evidenced, although there is a small setback compared to the pre-test due to the presence of a low performance of 5% of the students, this is assumed to be the result of a lack of practice activities for the students due to lack of time for the intervention carried out.

General Diagnostic



In general, there is evidence of an improvement after the application of the system of activities in which the high performance of the students increased by a margin of 33%, adding to the students who already had it since the application of the pre-test, thus reducing the

medium level and the presence of the low level that was not present before, which is deduced in the analysis of the previous dimension.

4.3 Hypothesis testing

Scientific hypothesis: if a system of activities based on the spaced repetition technique is implemented, there is an improvement in the acquisition of specific English vocabulary in fifth semester students of Clinical Psychology at the Technical University of Machala.

Statistical hypothesis:

H0: There is no relationship between the improvement in the acquisition of specific English vocabulary and the implementation of a system of activities based on the spaced repetition technique.

H1: There is a relationship between the improvement in the acquisition of specific English vocabulary and the implementation of an activity system based on the spaced repetition technique.

| | |
|---|--|
| $\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$ | χ^2 : Estadístico Chi cuadrado. O_i : frecuencias observadas. E_i : frecuencias esperadas. $E_i = \frac{n_{i.} * n_{.j}}{n}$ |
|---|--|

Illustration 7 Chi-squared formula. Prepared by the authors.

The critical value for the chi-squared statistic is determined by:

$$X^2(1-\alpha) * (r-1) (c-1)$$

Degree of freedom:

$$DF = (r-1) (c-1) = 2$$

Margin of error

$$\alpha = 0,05$$

4.3.1 Value scale for students on the Pre-test and Post-test.

| ents | Instrum | High | Mediu m | Low | Total |
|-----------|---------|------|------------|-----|-------|
| Pre-test | | 7 | 11 | 0 | 18 |
| Post-test | | 13 | 4 | 1 | 18 |

Table 4 Value scale for students on the pre-test and post-test. Prepared by the authors.

4.3.2 Chi-squared calculator (X^2)

Observed frequencies.

| d | Observe | High | Mediu m | Low | Total |
|-----------|---------|------|------------|-----|-------|
| Pre-test | | 7 | 11 | 0 | 18 |
| Post-test | | 13 | 4 | 1 | 18 |
| Total | | 20 | 15 | 1 | 36 |

Table 5 Observed frequencies. Prepared by the authors.

Expected Frequencies

| E xpected | High | Medium | Low | Tot al |
|---------------|----------------------------|-----------------------------|----------------------------|-----------|
| P re-test | 10 $20 \cdot 18 / 36 =$ | 7 $15 \cdot 18 / 36 = 7$ | 0 $1 \cdot 18 / 36 = 0$ | 18 |
| P ost-test | 10 $20 \cdot 18 / 36 =$ | 7 $15 \cdot 18 / 36 = 7$ | 0 $1 \cdot 18 / 36 = 0$ | 18 |
| T otal | 20 | 15 | 1 | 36 |

Table 6 Expected frequencies. Prepared by the authors.

Chi-squared

| Chi-squared | High | Medium | Low |
|------------------------------|-------------|-----------------|------------|
| Pre-test | 0,9 | 1,63333333 3 | 0,5 |
| Post-test | 0,9 | 1,63333333 3 | 0,5 |
| Total (X²) | 6,066666667 | | |

Table 7 Chi-squared. Prepared by the authors.

4.3.3 Hypothesis testing

| Chi-squared | Critical value |
|--------------------|-----------------------|
| 6,066666667 | 5,99 |

Table 8 Hypothesis testing values. Prepared by the authors.

The verification of the hypothesis occurs by contrasting the results obtained from the chi-square statistic with the corresponding critical threshold. According to the theory, if the chi-square value is higher than the critical value, the null hypothesis (H₀) is rejected and the alternative hypothesis (H₁) is accepted. This means that there is a relationship between the improvement in the acquisition of specific English vocabulary and the implementation of a system of activities based on the spaced repetition technique in the fifth semester students of clinical psychology at the Technical University of Machala.

4.4 Analysis and discussion of the results

In this part of the research work, the results obtained during the initial diagnosis and after having implemented the intervention proposal are analyzed and summarized in order to determine whether the independent variable exerts a significant influence on the dependent variable. The initial state of the selected population was characterized by the notable absence of specific vocabulary necessary to understand the compendium corresponding to the subject of technical English, thus generating a scarce student-teacher interaction and therefore a

language production with insufficiencies despite the fact that the design of the lesson plans issued by the teacher covered the four basic English skills and practical activities of this.

After the application of the system of introductory activities to each class, significant improvements are shown in the number of English words needed in their basic and specific vocabulary to understand the different topics of the subject. Most of the group of students were able to actively respond to the questions posed by the teacher orally, and participate in the didactic activities carried out at the time of presentation of the vocabulary of the day at the beginning of each class, thus complying with the theoretical basis of the time intervals involved in applying the spaced repetition technique. However, the students continue with slight difficulty to produce in written form texts related to each of the topics of the respective unit despite having the list of general and specific words of the same, this is presumed to have its origin in the small amount of hours of English received per week (3 hours).

In this chapter, the implementation of the activity system was described in detail, in addition to confirming the validity of the results obtained after the pertinent analysis using the chi-square test. This supports the existence of a correlation between the use of the activity system based on the spaced repetition technique and the improvement in the acquisition of specific English vocabulary in the fifth semester students of the Clinical Psychology course at the Technical University of Machala.

4.5 Conclusions

After the bibliographic review was carried out, the implementation of the teaching-learning process of the specific vocabulary of the English language through the use of the spaced repetition technique was conceptually supported, it had a positive impact on the range of long-term memorized words that the students mastered regarding to the subject.

The application of the pre-test revealed a very limited command of the specific vocabulary required for listening comprehension and written material, and therefore, a scarce active participation during the classes.

During the theoretical elaboration process, the system of activities was designed and implemented in each introductory class, respecting the time intervals necessary for a correct

application of the spaced repetition technique, which contributed to correct the deficiencies found at the beginning of this research.

Finally, the post-test applied corroborated that the students showed a significant increase in the retention of the words and concepts studied during each class, in comparison with the traditional methods of vocabulary learning, which suggests that this technique is highly effective to achieve a lasting retention.

Recommendations

Given the paramount significance of this research and in light of the findings, the following recommendations are hereby formulated:

Delve deeper into the theoretical underpinnings of the technique and its pertinence within the field of psychopedagogy.

Precisely delineate the list of specific vocabulary words to be memorized.

Contemplate the implementation of this technique over an extended timeframe, featuring an increased number of intervals, to facilitate the memorization of a broader range of words.

Propose the adoption of the spaced repetition system as the foundational technique for the majority of individuals comprising an educational institution.

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Appendix

Clinical Psychology diagnostic test

* Indica que la pregunta es obligatoria

1. Correo *

2. Students' name: *

3. Which of the following terms means "Causas, síntomas y tratamientos"? *

Marca solo un óvalo.

- Causes, symptoms and treatments
- Causes, simpthomps and treetmeants
- Causses, symthomps and tritments
- Causes simthomps and treatments

4. Una persona con bulimia presenta tendencias a tomar medicamentos laxantes o diuréticos, el termino "tendencias" en ingles seria: *

Marca solo un óvalo.

- Trends
- Tendences
- Tendens
- trendence

5. Mark all the ways to express "enfermedad": *

Two of them are not correct

Selecciona todos los que correspondan.

- Illness
- Desire
- Disease
- Medical condition
- Wilness

6. Mark the terms related to Attention deficit hyperactivity disorder (ADHD) *

Selecciona todos los que correspondan.

- Behavior
- conduct therapy
- bulimia
- Anxiety

7. Which of the following terms are mental disorders *

Selecciona todos los que correspondan.

- Abulia
- Anaphylaxis
- Heartburn
- Catarh
- Bulimia Nervosa
- Anorexia nervosa
- Anxiety
- Chilblains
- Croup

8. A condition in which you: *

- feel light-headed or dizzy.
- feel restless or unable to sit still.
- faster breathing.
- have a fast, thumping or irregular heartbeat.
- have sweating or hot flushes.

Marca solo un óvalo.

- anxiety
- post-traumatic stress disorder (PTSD).
- obsessive compulsive disorder (OCD)

9. Is a mental health condition that causes extreme mood swings that include emotional highs (mania or hypomania) and lows (depression). *

Marca solo un óvalo.

- Bipolarity
- Schizoaffective Disorder
- Borderline Personality Disorder

10. A mental disorder that involves difficulties with attention, hyperactivity, and impulsivity is known as: *

Selecciona todos los que correspondan.

- Autism spectrum disorder
- Post-traumatic stress disorder
- Attention deficit hyperactivity disorder (ADHD)
- Schizophrenia

Clinical Psychology Post-test

* Indica que la pregunta es obligatoria

1. Students' name: *

2. Select the category of the vocabulary presented: *

4 puntos

Selecciona todos los que correspondan.

| | Noun | Verb | Adjective |
|----------------------|--------------------------|--------------------------|--------------------------|
| Delusional | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Somatize | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hallucination | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Persecuted | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. **Social anxiety disorder** involves an intense _____ of social situations, often leading to _____ of such settings due to fear of embarrassment or negative evaluation

* 1 punto

Marca solo un óvalo.

- fear; avoidance
 angeriness, dizziness
 happiness; hunger
 affection; trauma

4. **Depression** is a _____ disorder characterized by persistent feelings of _____ and loss of interest or pleasure in activities.

* 1 punto

Marca solo un óvalo.

- mood; sadness
 eating; angeriness
 learning; fear
 physical; extement

5. **Binge eating disorder** involves consuming large _____ of food in a short period, accompanied by a sense of lack of control, followed by feelings of _____ or shame or distress.

* 1 punto

Marca solo un óvalo.

- amounts; guilt
 variety; freedom
 plates,panic
 illness,self-steem

6. True or false:

En la oración "She felt **dizzy** and **fainted**" las palabras en **negrita** significan: mareada y desmayó?

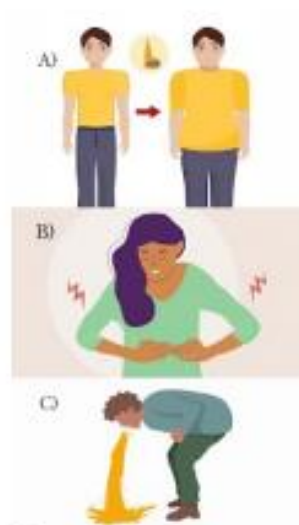
1 punto

Marca solo un óvalo.

- True
- False

7. Escoge el termino que mejor describa la imagen: *

1 punto



Marca solo un óvalo.

- a. weight gain; b. stomach cramps; c. throw up
- a. weight loss; b. pain; c. eating
- a. eating disorder; b. dizziness; c. fainting
- a. big clothes; b. coping; c. mood

8. **Encoding** is the process of converting sensory information into a mental representation that can be _____ in memory. *

1 punto

Marca solo un óvalo.

- stored
- retrieved
- recalled
- recovered

9. Which are the 3 primary types of learning styles: *

1 punto

Marca solo un óvalo.

- visual, auditory, and kinesthetic
- tactile; writing, and reading
- personality, patterns, and physical