



UNIVERSIDAD ESTATAL PENÍNSULA DE SANTA ELENA

**SCHOOL OF EDUCATION AND LANGUAGES PEDAGOGY OF NATIONAL
AND FOREIGN LANGUAGES**

**“SEMANTIC MAPPING AS A NEUROCOGNITIVE STRATEGY FOR EFL
LEARNERS”**

RESEARCH PROJECT

As a prerequisite to obtain a:

**BACHELOR’S DEGREE IN PEDAGOGY OF NATIONAL AND FOREIGN
LANGUAGES**

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La Libertad – Ecuador 2026

La Libertad, July 3rd, 2026

Advisor's Approval

In my role as Advisor of the research paper under the title “**SEMANTIC MAPPING AS A NEUROCOGNITIVE STRATEGY FOR EFL LEARNERS**” prepared by Tomalá Figueroa Karla Valeska And Ramirez Tenempaguay Mario Isaac, undergraduate students of the Pedagogy of National and Foreign Languages Career, Faculty of Educational Science and Language at Peninsula of Santa Elena State University, I declare that after oriented, studied and reviewed the project, I approve it in its entirety, because it meets the requirements and is sufficient for its submission to the evaluation of the academic tribunal.

Sincerely,

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Statement of Authorship

We, RAMIREZ TENEMPAGUAY MARIO ISAAC , with ID number 2400037079, and TOMALÁ FIGUEROA KARLA VALESKA, with ID number 2400029688, undergraduate students from the Peninsula de Santa Elena State University, School of Education Sciences and Languages, as a prerequisite to obtain a bachelor's degree in Pedagogy of National and Foreign Languages, in our role as authors of the research project "SEMANTIC MAPPING AS A NEUROCOGNITIVE STRATEGY FOR EFL LEARNERS" certify that this study work is our authorship, except for que quotes, statements, and reflections used in this research paper.



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Declaration

The information and content in this degree and research work are our responsibility; the intellectual property belongs to Universidad Estatal Península de Santa Elena.



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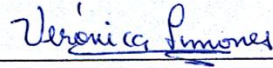
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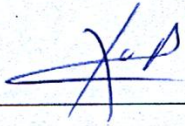
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Acknowledgment I

I sincerely want to express my gratitude to the creator of all things also known as God, who provided me with all things that I needed to fulfill this long awaited moment; obtaining my goals and also for giving me the opportunity to reach my plans successfully.

I would like to thank my beloved ones who supported me over these years. To my parents Gregorio, Sonia, and my siblings Mauricio and Omara who trusted in me, even though I had to leave many things behind they still continued to trust and support me so far. I also would like to mention the ones I admired and inspired me during this process. To my classmate and current group leader Tiffany, who always pushed me to complete the tasks at time responsibly and with dedication, such things I really admire from her. To my university friends for all the laughs and sad moments we faced while learning difficult concepts and to my thesis partner and friend Karla, who always helped me and was there explaining things that I could not understand well, since we were in the leveling course. I truly admire your dedication and efforts. In my opinion Tiffany and Karla you are the best students I have ever had the honor to meet.

Finally, thanks to my beloved teachers, who taught me the best lessons I have ever had, I will always remember your lessons and professionalism, which motivated me to continue learning and somehow foster me to be an excellent professional and comply with my duties responsibly.

It is a privilege to have learnt from all of you.

- Mario Isaac Ramirez Tenempaguay

Acknowledgment II

I would like to express my deepest and most sincere gratitude to everyone who, in one way or another, accompanied me on this journey and contributed to the completion of this research. In a very special way, I wish to highlight the invaluable guidance, constant support, and wisdom of my university professors, whose dedication and patience became the fundamental pillar in guiding this work. My heartfelt appreciation goes to Mario, my thesis partner, whose hard work, shared dedication, and teamwork were essential in bringing this project to fruition. I also extend my deepest gratitude to Tiffany, an admirable friend and colleague upon whom I could always rely throughout this career, and whose strength and support were a constant source of inspiration. Likewise, I am infinitely thankful to my family and friends for their understanding, unconditional encouragement, and for being the driving force that inspired me to successfully reach this professional milestone.

-Karla Valeska Tomalá Figueroa.

Dedication I

I want to dedicate this work to my parents, teachers, classmates, and all the people who always were beside me, observing my steps and sending support to fulfill this marvelous stage of my life. I also want to dedicate this to a special person, Allison, who always was there for me, supporting me in those long hours while I was studying and doing homework. Without your company, emotional support, every laugh, hug, and every “You are the best”, “You can do it”, this could not have been possible. You eased all the pain, confusion, and you were my light who shone in my deepest darkness; undoubtedly, your presence was the greatest privilege I have ever had. Thank you for having been my shining diamond and my other half but tiny. This triumph also belongs to you wherever you are right now.

Finally, I dedicate this project to myself, especially for all the effort and hours invested in learning and surpassing my own limits. All those experiences lived within this path, are definitely worth saying now, I finally made it.

Thank you everyone who always motivated me to continue believing in myself.

With love

Mario Isaac Ramirez Tenempaguay

Dedication II

I dedicate this work, first and foremost, to God, for being my guide and my strength at every step along this journey, for giving me the wisdom and patience I needed to keep going, even in the most difficult moments. To my parents, José and Karina, the people I love most in this world, and to my brothers, Diego and Alan, who have been an essential part of my life and this journey. Thank you for every sacrifice, for every “you can do it” when I wanted to give up, and for never letting go of my hand, even when the road got tough. This triumph is a reflection of all your love. To you, Steven Borbor, my life partner, thank you for being my calm in the midst of chaos and my strength on days when I’m exhausted. Thank you for every hug that came just in time, for drying my tears without asking questions, and for believing in me even when I stopped believing in myself. Your love made this journey—which was sometimes so heavy—easier to bear, and your patience taught me that true support isn’t measured in words, but in constant presence. Thank you for celebrating each of my achievements as if they were your own.

With love

Karla Valeska Tomala Figueroa.

Abstract

Vocabulary acquisition is one of the main challenges faced by students of English as a foreign language, since the human brain has a limited working memory capacity to process large numbers of new words at the same time, which often leads to cognitive overload and hinders vocabulary retention. To address this issue, this study analyzes the role of semantic mapping as a neurocognitive strategy, examining teachers' pedagogical experiences to understand its influence on vocabulary retention and semantic organization among EFL students. For a more detailed exploration, a qualitative methodology and a phenomenological study were chosen as a methodology, with data collected through eight open-ended questions in Zoom interviews with five teachers with experience in neuroscience. The results reveal that semantic mapping organizes vocabulary visually, reduces working memory overload, and strengthens long-term retention, confirming that it is an effective and flexible strategy for vocabulary learning in EFL classrooms.

Key words: Semantic mapping, Neurocognitive strategy, Vocabulary retention, Working memory, EFL learners

Resumen

La adquisición de vocabulario es uno de los principales desafíos que enfrentan los estudiantes de inglés como lengua extranjera, ya que el cerebro humano tiene una capacidad limitada de memoria de trabajo para procesar grandes cantidades de palabras nuevas al mismo tiempo, lo que suele provocar sobrecarga cognitiva y dificulta la retención del vocabulario. Para abordar este problema, el presente estudio analiza el mapeo semántico como una estrategia neurocognitiva, examinando las experiencias pedagógicas de los docentes con el fin de comprender su influencia en la retención de vocabulario y la organización semántica en estudiantes de EFL. Para una exploración más profunda, se seleccionó como metodología el método cualitativo y un estudio fenomenológico, recolectando los datos mediante ocho preguntas abiertas en entrevistas vía Zoom a cinco docentes con experiencia comprobada en neurociencia. Los resultados revelan que el mapeo semántico organiza el vocabulario de manera visual, reduce la sobrecarga de la memoria de trabajo y fortalece la retención a largo plazo, confirmando que es una estrategia efectiva y flexible para el aprendizaje de vocabulario en las aulas de EFL.

Palabras clave: Mapeo semántico, Estrategia neurocognitiva, Retención de vocabulario, Memoria de trabajo, Estudiantes de EFL

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Introduction

Through several research it has been established the relevance of semantic mapping when teaching and learning a second language. However, there is still skepticism about the benefits of including this neurocognitive strategy into the lessons, as well as lack of knowledge about the mechanisms involved in the learning process, specifically in the brain and limited teaching strategies that hinders the overall success.

This topic has been researched around the globe, where the information obtained from its literature gives light to how semantic mapping is conceived. For instance, in Saudi Arabia and Morocco, investigators determined that including semantic mapping into the lessons especially in teaching new vocabulary could improve the learning process significantly. In Latin America, a research done in Colombia pointed out that this neurocognitive strategy could facilitate oral production in terms of fluency, showing that through semantic organization, it is possible to make learners take ownership of the language. Lastly, in Ecuador, where it was found that the influence of semantic relationships has a positive impact over traditional methods among EFL learners.

Over this research process, it was found crucial information that showed how memory works, particularly working memory and its fundamental role when creating neural paths which allow EFL learners to create meaningful learning experiences. Additionally, presenting essential information about neurocognitive processes that occurs when learning a second language; thus unveiling the challenges and positive aspects faced in a real classroom setting where semantic mapping was integrated as a neurocognitive strategy within lessons.

Given these reasons, the purpose of this study is to explore how Semantic Mapping as a Neurocognitive strategy, could be used to support the learning of new vocabulary through the

principles of Cognitive Load Theory, which explains how the low capacity of the working memory affects learning. Moreover, relevant information from different experts' perspectives about the advantages and disadvantages of utilizing semantic and visual organization, which is the core of this aforementioned neurocognitive strategy.

Due to the objective of this study, the qualitative design and phenomenological study was implemented to ensure the quality of the information gathered, which was explored through the perspective of teachers, who are specialists in the matter.

It is important to note that the data collection was obtained through interviews with eight open-ended questions via the ZOOM platform to optimize and facilitate the collection of data, maintaining the veracity of responses meticulously.

The findings obtained, reflects the utility of this strategy to support the learning of vocabulary, consequently its potential to engage students with the lesson by constructing meaningful learning experiences and the activation of prior knowledge through semantic and visual organization. Thus, highlighting the importance of knowing how the individuals' brain works, precisely how memory works when retrieving, recalling, and storing new information, lastly, how to apply this theoretical concept in the classroom effectively.

Consequently, this research project is constructed from relevant information from the principles of neuroscience and its role within modern education, with neurocognitive perspective to understand how strategies developed under this perspective could benefit EFL learners, not only increasing cognitive processes but the level of interactions and reception of vocabulary, having a favorable influence over traditional methods. Therefore, exploring this field further is suggested to foster deep understanding of semantic mapping, aiming to facilitate and improve English language teaching in our local community.

Chapter I

Problem Statement

Vocabulary learning constitutes one of the fundamental pillars in the acquisition of English as a foreign language, being essential for the development of the four language skills. Its role implies that the learner must constantly integrate a vast amount of linguistic data into their existing mental framework; consequently, the process of internalizing new words is a complex cognitive task that depends heavily on how information is structured. However, one of the most significant challenges that EFL students face lies in the cognitive overload generated when excessive amounts of new vocabulary are presented simultaneously, exceeding the natural limitations of working memory. As has been established by Miller (1956), working memory capacity is limited to approximately 7 items (plus or minus 2), although more recent research by Cowan (2001) suggests that the real limit may be even lower, around 3 to 4 “chunks” or units of information. This cognitive limitation represents a noticeable obstacle in educational contexts where the amounts of vocabulary that exceed an individual's brain innate capacities to retain information are frequently introduced, without considering the processing variations among students.

Beyond the constraints of working memory, the complexity of the English lexicon poses additional hurdles for the learner. Whilst acquiring a certain range of vocabulary is one of the main goals of EFL learners, the nature of English words represents a challenge in the long-term retention process due to its variations and sometimes abstract meanings that interfere in the instructional process. Hence, this leads to difficulties in memorizing and recalling vocabulary even if they know some of the word fragments (Ismail et al., 2022).

In addition, English words often differ in use and meaning making it difficult for EFL learners to distinguish subtle nuances in meaning and use among certain terms that share similar connotations. As stated by Schmitt and Schmitt (2020) some English lexemes can be classified by their roots and synonyms, antonyms, hyponyms, and meronyms, all of which vary the functions and significance of words applied in numerous and specific contexts. These variations in particular, could lead to problems related to understanding the differences in meaning among synonyms in a phenomenon called synonymy (similar words that could mean the same in the L1 language whereas can significantly change in terms of use in the target language).

Furthermore, these cognitive and linguistic challenges are often intensified by the lack of teaching strategies when presenting new content without taking into account the individual differences in processing capacity. Karimzadeh and Sabeki (2023) highlight that differences in working memory and learner aptitude have a preponderant role in lexical knowledge, demonstrating that some students can handle multiple lexical items simultaneously while others experience cognitive saturation with lower loads. Consequently, when vocabulary is introduced without effective organization, it triggers a state of cognitive overload (Sweller, 1988). According to Baddeley (2003), the working memory system is responsible for the temporary storage and manipulation of phonological and semantic information necessary for vocabulary acquisition; therefore, its saturation seriously compromises the lexical learning process in EFL students. The persistence of these pedagogical challenges suggests a need to re-evaluate how vocabulary is presented and structured in order to understand how to optimize cognitive resources for more effective language acquisition.

Problem Question

Main Question

- How do EFL teachers perceive semantic mapping as a neurocognitive strategy to enhance vocabulary retention and semantic organization in their students?

Specific Questions

- ✓ What are teachers' perceptions regarding the effectiveness of semantic mapping in improving EFL learners' vocabulary retention and semantic organization?
- ✓ How do teachers currently implement semantic mapping as a neurocognitive strategy in their vocabulary teaching practices?
- ✓ What advantages and challenges do teachers encounter when applying semantic mapping to support EFL learners' vocabulary development?

Justification

The need to optimize the acquisition of vocabulary in the English as a foreign language context moving beyond traditional memorization towards a process based on cognitive perspective arises in a globalized world where the mastery of English is fundamental for the social and professional integration; nevertheless, it cannot be reached without a solid lexical basis. As Schmitt and Schmitt (2020) points out, the vastness and constantly evolving nature of English represents a unique challenge for learners. In that sense, it is essential to identify not only how many words are taught, but also how they are organized and structured to guarantee a meaningful learning.

It is also crucial to understand the purpose of this study from a pedagogical perspective, where the teaching practices need to be aligned with the biological reality of the human brain by exploring EFL teachers' experiences grounded in neurocognitive approaches that support the

brain and facilitate long-term retention. While authors like Schmitt and Schmitt (2020) emphasizes the vastness and complexity of the English lexicon, the classroom reality often exposes a disastrous dependence of traditional memorization, which may not adjust to the natural functioning of the brain.

For this reason, it is primordial to highlight the relevance of understanding how neurocognitive principles can be integrated in the daily teaching practices, moving forward to an organized and reflexive presentation of vocabulary rather than just cramming. In this way, the learning experience can be improved, ensuring that the new information is retrieved and applied in real life communication. Additionally, the social relevance in this paper is reinforced by showing that the insufficient vocabulary may lead to frustration and academic failure. As concluded by Ledesma et al. (2024) low English proficiency and the resulting learning difficulties negatively affect student persistence, accentuating a major concern about dropout school rates in English related programs. Therefore, this thesis seeks to present a strategy that make the learning process less demanding and more engaging, by exploring the interconnection between neuroscience and teaching, in which it is possible to find ways to keep learners connected with their goals and ensuring that EFL classrooms remains as a growing space, thus contributing to better retention and reducing the potential for students to disengage from their English studies.

Objectives

General Objective

- To analyze the role of semantic mapping as a neurocognitive strategy through the examination of teachers' pedagogical experiences, in order to understand its influence on vocabulary retention and semantic organization in EFL learners.

Specific Objectives

- ✓ To explore teachers' perception about the effectiveness of semantic mapping in improving vocabulary retention and semantic organization among EFL learners
- ✓ To describe how teachers utilize semantic mapping as a neurocognitive strategy in their vocabulary teaching practices.
- ✓ To identify advantages and challenges teachers 'face when applying semantic mapping to support EFL learners' vocabulary development.

Chapter II

Theoretical Framework

Background

The theoretical framework in this study is constructed through the analysis of relevant International, Latin American, and Regional literature related to semantic mapping as a neurocognitive strategy for vocabulary in English as a Foreign Language. The research establishes theoretical foundations particularly focusing on the influence of neurocognitive strategies in the development of vocabulary retention and semantic organization in EFL learners. It provides a conceptual lens through which semantic mapping is analyzed in educational contexts. Built on legal, neuroeducational and pedagogical foundations, this framework emphasizes the definitions, advantages, and challenges of semantic mapping-based methods for teaching English vocabulary.

In Saudi Arabia, a research conducted over 60 Saudi EFL students randomly divided in control and experimental groups, showed that semantic mapping had significant impact on vocabulary mastery, because it presents a mechanism that helps students to connect their prior knowledge with the current knowledge in a hierarchical way for studying the relationships between words. The results revealed that teaching this neurocognitive strategy has a meaningful effect on vocabulary mastery with scores from the experimental group varying significantly compared to the control group. This study recommends integrating semantic mapping instruction into the EFL classrooms, as it helps revive students' long-term memory.

(Mouchrif et al., 2023) investigated the effectiveness of semantic mapping as a pre-reading strategy to improve reading comprehension of cultural texts among EFL students in Morocco. In their quasi-experimental research design, the experimental group was taught

through semantic mapping and the control group received direct vocabulary instruction, with the experiment lasting eight sessions and administration of pre-test and post-test along with individual interviews. The results indicate that semantic mapping produced significant improvement in the inferential level of reading comprehension, although no significant effects were observed at the literal level.

The teaching of English as a Foreign Language in Latin America has been characterised by the constant search of methodologies that respond to the specific needs of the regional educational contexts. Unlike environments where English is present on a daily basis, the Latin American countries face the challenge of developing communicative competences in students whose exposure to the language predominantly is limited to the classroom. This situation has motivated researchers in the region to explore innovative pedagogical strategies that enhance meaningful learning of English, highlighting among them the use of visual tools and graphic organizers such as semantic maps. Rodriguez (2022) carried out research about the implementation of semantic maps as a neurocognitive strategy to facilitate verbal fluency in oral presentations of students of B1 level at the Speak English Institute de Cali, Valle del Cauca. Within this study, he addressed a current problem in Latin American classrooms: the existence of mixed level groups where some students master English with relative ease while others experience significant difficulties in expressing themselves, generating prolonged silence periods, frustration and eventually dropout. Furthermore, he mentioned that this disparity is not caused by intellectual capacity differences, but students with low performance who have not developed effective strategies that allow them to organize their ideas and take ownership of the language.

In the national context where English language learning faces particular challenges related to the limited exposure to the language and pedagogical resources, the research about effective strategies of vocabulary teaching has gained relevance in the last decades.

Chimbo (2024) investigated the influence of meronymy and holonymy in Loja in ninth grade EFL students' vocabulary instruction, demonstrating that the use of semantic relationships had a positive impact. These results showed improvements in the retention of words as well as the gaining of confidence in the level of English interactions, with a surprising 75% of reception among the participants, concluding that semantic strategies facilitate learning over traditional methods.

Additionally, studies in similar contexts that explored semantic mapping as an effective strategy, noticed that the use of semantic methods notably contributes to the learning outcomes, allowing students to visualize connections between word meanings (Rahmawati, 2021). These backgrounds point out the relevance of implementing neurocognitive strategies which are based on semantic relationships in Latin American EFL contexts where the poor implementation of pedagogical strategies and exposure to the target language require innovative and effective didactical alternatives.

Pedagogical Basis

Cognitive load theory developed by Sweller explains how the low capacity of the working memory affects learning. This theory has direct implications for vocabulary instruction when the information is visually and structurally organized, reducing the extrinsic cognitive overload and allowing learners to dedicate more mental resources to deep thinking and the integration of vocabulary (Sweller et al., 2011).

Likourezos (2021), also stipulated that CLT is based on prior knowledge of the structure and processes of the human mind, also known as human cognitive architecture. Human cognitive architecture in turn allows us to understand how we learn, think, and solve problems, which generates procedures specifically designed to reduce cognitive load, facilitating the acquisition of knowledge held in long-term memory. Thus, it is crucial to understand how structured information is indispensable within the learning process, allowing the brain to manage heavy workloads in small chunks and generating less conflict between learners and new contents.

Active learning, conceptualized by Bonwell and Eison (1991) is based on the principle in which students learn better when they actively participate in the construction of knowledge rather than just being passive receptors of information. In that sense, learners give meaning to new information and ideas, connecting them with prior knowledge in order to process and then understand the new material. This pedagogical approach emphasizes the active participation in the learning process through meaningful activities and reflection on these activities.

According to Arumugam et al.(2020), whose insights are reviewed by Hasbi (2024), stated that active learning supports students' participation through interactive activities and conceptual mapping highlighting multiple advantages including a major capacity of retention, improved understanding, and practical application of knowledge in diverse contexts.

The scheme theory originally developed by British psychologist Frederic Bartlett and later expanded by Rumelhart (1980), proposes that the knowledge is stored in organized mental structures called schemas or schematas. Rumelhart defined schemas as “blocks of cognitive construction”, these structures allow to organize and process new information based on previous knowledge.

Crowley (2022) highlighted this theory as a prominent way to develop vocabulary in EFL learners' classrooms, as students possess previous lexical schemas (networks related by meaning, function, and category), and an approach that can build a richer schematical network, consequently strengthen memory. When new vocabulary is taught or conceptually related through semantic maps, these schemas are strengthened, making the new information more accessible and easily retrieved in appropriate contexts (Wang, 2024).

Theoretical Basis

Neuroscience as a pillar in modern education

Neuroscience, also known as Neural Science, is a modern interdisciplinary science that studies the nervous system from a microscopical perspective to how behaviour, thoughts, emotions, and learning are produced in our brain. It serves as a bridge that does not work alone, it feeds on different disciplines such as biology, psychology, technology, and education; in that way, explaining how the nervous system develops, its structure, and what it does. At a cognitive and behavioral level, neuroscience explains how the brain allows individuals how to speak, remember, make decisions, feel, pay attention and learn. Additionally, it demonstrates magnificent explanations about neuroplasticity in which illustrates the brain's capacity to change, shape, and create new neural connections through life in response to learning and lastly cognitive overload, pointing out that the brain is not a machine but a limited information processor.

Nouri (2024) stated that neuroscience can be viewed from two angles, one as a scientific field of study and second as a profession. From a field of study perspective, educational neuroscience allows us to explore connections between the mind, the human brain, and education. Due to the vast complexity of the nervous system, neuroscience has been branched

into different specialities highlighting neurocognitive sciences and neuroeducation, being expounded in the latter from a pedagogical perspective, providing insights of the human brain's biological rhythm.

Neuroeducation in teaching.

It is one of the fastest growing disciplines; as an emerging interdisciplinary field, it integrates cognitive psychology, and pedagogy to understand how the brain learns and apply knowledge into the designing of more effective educational strategies. This approach recognizes that learning fundamentally is a brain process that involves neuronal changes, and understanding these mechanisms may optimize teaching and improve the learning outcomes (González et al., 2018). With this in mind, relying on its principles, it is possible to create awareness in EFL contexts where it is essential to know how the learning process occurs, which elements allow the reception of knowledge, what areas are involved in the retention and recalling of information so as a means to support the integral development of learners through clear and realistic strategies adapted to students' needs.

Cognitive neuroscience

Neurocognition is a multidisciplinary concept that explores the intricate relationship between neurological processes and cognitive functions. In essence, neurocognition seeks to understand how the brain's structures and activities influence and interact with various aspects of the human thought and behavior. It comprises the study of mental processes such as perception, attention, memory, language and visual functions, problem-solving, decision-making, reasoning, and visual and learning memory, examined through the lenses of neuroscience. Besides, this aforementioned concept recognizes that cognition is not merely a product of the mind or an

isolated mechanism but is deeply interconnected with the primary neural mechanisms responsible for the process mentioned previously. Also, it investigates the neural networks, brain structures, and neurotransmitter systems that contribute to cognitive processes (Arsalidou, 2024).

From this perspective, cognitive neuroscience provides the necessary scientific validation to track how these mental operations manifested within neural pathways. As a compass that allows us to understand those complex cognitive architectures, and decipher the neuroplasticity mechanics in which biological boundaries such as working memory are established; ultimately, determining how knowledge is successfully consolidated. From this perspective, cognitive neuroscience provides the necessary scientific validation to track how these mental operations manifested within neural pathways. As a compass that allows us to understand those complex cognitive architectures, and decipher the neuroplasticity mechanics in which biological boundaries such as working memory are established; ultimately, determining how knowledge is successfully consolidated.

Neurocognitive Strategies

Neurocognitive strategies refer to approaches or techniques that leverage understanding of aspects such as neurological processes and cognitive functions which serve to improve individuals' performance and functioning. Fundamentally, these strategies are specifically designed to optimize the brain's innate capabilities and its ability to adapt also known as neuroplasticity, which constitute a fundamental pillar in understanding how the brain stores and retrieves information during the learning process. Particularly, in those cortical areas responsible for the language, as proposed by Fujii (2016) the dual stream model which explains that language involves two neural pathways: the dorsal stream for phonological processing and the ventral stream for semantic processing, reflecting the neurocognitive basis of language learning.

Semantic Mapping

Semantic mapping is a cognitive strategy which consists of visually organized and connected word meanings through graphic displays that serve as representations of the relationship between words and concepts. These relationships not only state related words in case of synonyms, but they also have related antonyms; in this way, vocabulary is expanded, and students can connect new words with the words they already know (Faruk and Aturahma, 2023). Semantic maps typically are presented in a very particular way, placing the main concept or keyword in the center with branches spreading out. Each of those branches are labeled with subordinate ideas or subcategories, related words, and additional supporting information such as definitions, examples, or images which can be included to clarify the connections between the content related. Thereby, this structure provides a visual representation of ideas, allowing learners to observe semantic networks, and facilitating both comprehension and retention of new vocabulary (Kazandjian, 2017).

According to Udaya (2022), semantic mapping has the potential to enhance the understanding of words, increase learners' active learning by developing their conceptual knowledge, and helping them to memorize new words quickly and effectively.

With all those theoretical related concepts it is possible to build a solid argument that serves as the cornerstones to develop teaching strategies that align much better within EFL contexts, pointing out the cognitive processes and its mechanics.

Legal Basis

The articles cited below highlight the importance of education for everyone, as well as how English should be taught in academic settings using cognitive and meaningful methodologies.

Constitución de la República del Ecuador

In the Constitución of Ecuador (CRE) the supreme principles governing the stimulation of cognitive human capabilities and intellectual development, in Article 27, establishes that “la educación se centrará en el ser humano y garantizará su desarrollo holístico... estimulará el sentido crítico, el arte y la cultura física, la iniciativa individual y comunitaria, y el desarrollo de competencias y capacidades para crear y trabajar” (Constitución de la República del Ecuador, 2008, Art. 27).

This constitutional article defines the legal basis for incorporating cognitive science into the educational process, by stipulating that education must ensure holistic development and foster skills. Also through legislation, it is possible to call for practices that improve how students process information; therefore semantic mapping as a neurocognitive strategy addresses this need, because it is adapted to the brain’s innate ability to classify information, visually illustrating the mental schemas that help students learning English as a foreign language acquire vocabulary precisely, transforming traditional mechanisms to facilitate memorization into a cognitive development required by the State.

Ley Orgánica de Educación Intercultural

According to the Organic Law on Intercultural Education (LOEI), in the single chapter of principles of the national system, in article 2.3, section h, quality and warmth establish that:

Garantiza el derecho de las personas a una educación de calidad y calidez, pertinente, adecuada, contextualizada, actualizada y articulada en todo el proceso educativo, en sus sistemas, niveles, subniveles o modalidades; y que incluya evaluaciones permanentes.

Así mismo, garantiza la concepción del educando como el centro del proceso educativo, con una flexibilidad y propiedad de contenidos, procesos y metodologías que se adapte a

sus necesidades y realidades fundamentales. Promueve condiciones adecuadas de respeto, tolerancia y afecto, que generen un clima escolar propicio en el proceso de aprendizajes. (LOEI, 2021).

This organic principle provides a fundamental legal basis for this research project. The law explicitly requires a flexible methodological approach that focuses on the individual needs of the student, while also mandating a positive and welcoming school environment. Therefore, Semantic mapping from a neurocognitive perspective, serves as an adaptable framework that fulfills this mandate exceptionally well. This strategy, which organizes vocabulary visually based on students' cognitive patterns, places the learner at the center of their own language processing. Moreover, educational neuroscience shows that a warm and welcoming environment reduces anxiety and cognitive load, enhancing the neural connections necessary for effective foreign language learning.

Chapter III

Methodological Framework

Research Method

Qualitative Research

This project is developed using qualitative research, based on the perceptions and experiences of teachers who integrate neurocognitive strategies into the vocabulary development in the classroom. For this purpose, a phenomenological design was employed, allowing for an in-depth exploration of teachers' subjective experiences regarding the challenges and barriers in the vocabulary memorization process. This approach enables the collection of rich, detailed data, in line with Hernández et al. (2010), who explains that qualitative research involves collecting non-numerical data to explore and refine research questions. Likewise, Taherdoost (2018) emphasizes that the choice of research method depends on the topic and type of data, in that sense qualitative methods are particularly suitable for understanding complex phenomena in their natural context as they really occur.

Phenomenological Studies

This is phenomenological research, a methodology which is positioned in a unique way to help experts to learn about others' experiences, focusing on the study of lived experiences from an individual within their world (Neubauer et al., 2019). This type of research, as explained by Bonyadi (2023), is a practice that aims to understand, describe and interpret human behaviour and the meaning individuals construct from their experiences, as they are experienced by the participants, without imposing prior theories or pre-established concepts.

Therefore, the study focuses on how teachers perceive the influence of semantic mapping on the neurocognitive vocabulary learning in EFL learners. This design aims to capture detailed

experiences of neuroscience teachers who work with EFL students in educational settings that integrate or incorporate semantic mapping as a strategy for vocabulary development and retention.

Data Collection Technique

For the development of this qualitative research a semi-structured interview was employed as a technique, which is more than just a simple questioning, is a dialogue or conversation between the interviewer and the interviewee with open-ended questions that allow each participant to expand their ideas and thoughts in a more open manner. According to Pin (2023), a semi-structured interview is a technique of data collection highly used in qualitative research that consists in dialogue between the researcher and the participant, guided through a protocol of flexible interview and complemented with probes and comments. In that sense, this method allows investigators to compile open data, explore thoughts, feelings, and beliefs of participants about a particular topic.

The semi-structured interview provided valuable information about participants' perspectives and knowledge, working with individuals from diverse backgrounds or instructional realities related to the implementation of semantic mapping. It also helped to create a comfortable and trusting space where participants could share their successes and challenges.

Questionnaire

According to Ruslin et al. (2022), a questionnaire is a flexible instrument that allows researchers to obtain in depth responses while adapting questions dynamically based on participants' answers. Being this a useful tool for qualitative in which application can provide detailed information faced by the interviewers from social interactions in a comfortable scenario;

ultimately, guaranteeing the effectiveness of the collection of the responses and ensuring its quality.

Type of questions

The type of questions that this questionnaire includes are 8 open-ended questions which is conducted via ZOOM platform, offering a facility for professionals in accordance with their schedule availability. During this process it is possible to gather information about how teachers assess their students' progress in the classroom and whether the techniques they employ align with the stated learning objectives. This tool sought to gather relevant information by valuing the shared experiences of each participant.

Data Collection Procedure and Resources

Table 1

Data Collection Processing

Questions	Justification
What	Interviews
Where	EFL educational settings where semantic mapping is implemented
When	First academic term, 2025
How	Virtual one-on-one interview via Zoom (8 open-ended questions)
What for	To describe the advantages of teaching vocabulary through semantic mapping as a neurocognitive strategy, based on teachers' expertise in neuroscience.

Population and Sample

The target population for this study comprises five teachers with proven expertise in neuroscience who integrate semantic mapping within their teaching methods in EFL vocabulary teaching contexts. This sample was precisely selected using a non-probabilistic convenience sampling method. This sampling method, according to Squire et al. (2024), is appropriate for phenomenological research, as it is able to conduct deep and focused exploration rather than statistical generalization, this way allowing researchers to properly select participants who possess knowledge of the phenomenon under study. In this way, the sample allows to explore detailed perceptions and capture the essence of shared experiences from the participants, respecting their anonymity in a flexible way without revealing specific institutional information.

Each participant was interviewed in person through a questionnaire with open-ended questions, allowing them to explain and describe each question related to the main topic. With this method, it is easier to connect with the interviewees, facilitating interaction. In addition, with the answers that the participants provide, it is possible to recognize both the aspects that favor its application and those that hinder teaching practice, which allows to understand with more accuracy its true effectiveness in the classroom.

Chapter IV

Analysis and Findings

The analysis and findings presented in this section exposes authentic responses from experts who possess experience in utilizing semantic mapping as a strategy for EFL learners in real classrooms. Through this data gathering, vital insights have been found which provide with the necessary information to support this paper, emphasizing the correct use of this neurocognitive strategy as well as the benefits and challenges faced at first hand in varied classroom settings.

The following interpretations of the collected data serves as a guide to determine the veracity of the information and which aspects converge or what are those that differ from studies previously carried out by different authors about semantic mapping as a neurocognitive strategy; through interviews and accurate transcriptions of the responses which ensure the validity of the results without omitting any piece of information.

Table 2

Analysis of the Interviewees about Semantic Mapping as a Neurocognitive strategy for EFL learners.

<i>Question</i>	<i>From your perspective, how do students respond when vocabulary is presented in a semantic mapping way in comparison with a traditional list in which words are presented?</i>			<i>The English language has many synonyms and nuances that sometimes confuse students. How does the use of semantic maps influence the ability in which students can organize and distinguish those nuances in their minds?</i>
	<i>Considering working memory, in which ways have you observed that semantic mapping helps students to process vocabulary much better without saturation?</i>	<i>Based on your teaching experience, what changes, if any, have you noticed in students' vocabulary retention after using semantic mapping activities?</i>		

<i>Answers</i>	Visual elements facilitate the reception of the lessons, particularly when words are presented in an organized way. Also, the visual organization and connections between words creates an engaging environment where EFL; consequently, increasing the level of interactions in the classroom.	Semantic organization reduces cognitive overload by breaking down complex information into manageable parts or chunks. In that way, semantic mapping serves as a scaffold that supports information processing as well as retention among students.	The progressive use of semantic mapping activities generates significant improvements related to strong long-term memory since students tend to remember words for longer periods, through the creation of neural paths that facilitates the learning process.	Semantic mapping enables students to differentiate subtle meanings of words when they are presented in categories, as well as how they are used in context by taking into account the intensity and formality that makes a big difference when producing writing tasks.
<i>Authors</i>	When vocabulary is presented in an organized way, learners enjoy the lessons due to the unique features semantic mapping offers, thus improving the level of interactions during the lessons (Asfari et al., 2025).	Visual working memory is a system that permits to maneuver information or semantic concepts through the use of visual representations, enhancing the memory capacity. (Star et al., 2020)	Long-term memory is a powerful almost unlimited capacity that shows beneficial aspects in the process of retrieving information, even though it takes time and effort to develop it. (Zhao et al., 2023).	The brain presents a unique capacity to establish connections or semantic relations which are interconnected with the communication, as well as semantic relationships, patterns, and neural pathways. (Zhang et al., 2020).

Table 3

Analysis of the Interviewees about Semantic Mapping as a Neurocognitive strategy for EFL learners.

<i>Questions</i>	<i>Would you mind describing step by step how you introduce and develop a semantic mapping activity for EFL learners?</i>	<i>In your teaching experience, what kinds of strategies or visual aids do you typically use or prefer for active vocabulary instruction?</i>	<i>From your academic perspective, what advantages do you think semantic mapping offers over traditional methods of memorizing word lists?</i>	<i>What challenges or limitations might teachers and students face when implementing semantic mapping in an EFL classroom?</i>
<i>Answers</i>	Firstly, the placement of a root word, central topic, or a key concept that is strongly related to the lesson objective which activates their prior knowledge. Secondly, the use of brainstorming or “chain words” to expand the map by using related words to the central root. Finally, as part of assessment evaluation the students shared what they learned during the lesson by applying the new words in a contextualized way.	The use of realia offers an engaging and memorable way to activate vocabulary instruction as well as the use of graphic organizers, flashcards, semantic maps, mind maps, wordwalls, word banks, context-based activities, and even digital tools if possible.	The use of semantic mapping fosters memory retention, creating consciousness about meaning that prevents students from mechanically translating unfamiliar words. Furthermore, it promotes critical thinking and deeper cognitive processing by illustrating relationship between words as it keep them engage with those visual and interactive elements	An important challenge is time consuming, which occurs when not all students are familiar with this strategy, so they could not understand how to use them properly. Likewise, the different learning styles that students possess in which cases the cognitive processing is varied and difficult to address specially among students with different proficiency levels.
<i>Authors</i>	Designing a lesson plan is a process of organizing and preparing the materials which are specifically and strategically selected to present the lesson with clear objectives, activities, and assessments to facilitate the learning process through meaningful learning. (Abdulaeva, 2024).	Visual elements such as graphic organizers, mind maps, brainstorms, and semantic maps, facilitate the development of critical thinking skills and allow learners to clarify concepts that cannot be related easily; gradually, developing intrinsic motivation by going beyond traditional teaching methods (Alqasham and Al-Ahdal, 2021).	According to Feng et al (2023), mind-mapping techniques in a form of semantic mapping, provided visual representations that acted as mnemonic devices, helping EFL learners retain vocabulary in their long-term memory while also drawing their attention to semantic similarities and differences among words,	Khoyyiroh et al (2025), reported that, although students showed positive perceptions of semantic mapping, teachers faced difficulties related to time management and varying levels of student participation during its implementation in English language teaching classrooms.

Chapter V

Conclusion and Recommendations

This chapter contains personal reflections that arose during the research process. It gathers experiences, initial ideas, and lessons learned during the development of this project called “Semantic Mapping as a Neurocognitive Strategy for EFL Learners,” which aimed to investigate the impact of semantic mapping as a neurocognitive strategy on vocabulary retention and semantic organization in students of English as a foreign language. To achieve this goal, the study included a review of relevant articles and the direct experience of experts in the field, who provided valuable insights based on their training and professional practice. From all this, it was possible to identify advantages, challenges, and key aspects that enrich our understanding of the topic. The chapter ends with recommendations for future research and teaching practice.

Conclusions

The present study has been concerned with a specific problem experienced in the context of teaching English as a foreign language. This problem is represented by the difficulty of EFL students in retaining vocabulary effectively due to the cognitive overload resulting from the excessive and chaotic presentation of new words and natural limitations of working memory. Given this situation, semantic mapping as a neurocognitive strategy was proposed as a viable alternative to transform this reality, and the findings obtained throughout this study allow us to affirm that this approach was successfully validated.

First, through the literature review, it was possible to establish a solid theoretical foundation supporting the use of semantic mapping from a neurocognitive perspective. Theoretical concepts such as Sweller’s cognitive load theory, Baddeley’s research on working memory, and the principles of neuroplasticity were instrumental in elucidating why the visual

and organized presentation of vocabulary facilitates the processes of storing and retrieving information in the brain. Rumelhart's schema theory also provided a lucid explanation of how students link new vocabulary to pre-existing mental structures, greatly improving their learning. This theoretical framework allowed for a solid response to the study's overall objective by underscoring the direct impact of semantic mapping on vocabulary retention and semantic organization among EFL students.

Second, interviews conducted with experts in the field; bachelor's and master's degree holders with experience in applying this strategy, allow them to explore their perceptions regarding the effectiveness of semantic mapping, thereby fulfilling the first specific objective. The experts agreed that this strategy generates a notable change in the way students process vocabulary, since by presenting words in an organized and visually connected manner, students demonstrate greater engagement, motivation, and comprehension compared to traditional methods of memorizing lists. Similarly, it was established that semantic mapping acts as a cognitive scaffold that facilitates the processing of information into manageable chunks, directly reducing working memory overload, which was identified as the central problem of this research.

Regarding the second specific objective, which aimed to describe how experts implement semantic mapping in their practice, we were able to identify a structured process that begins with the activation of prior knowledge through the selection of a central concept, continues with the expansion of the map through brainstorming and collaborative work, and culminates in a contextualized assessment in which students apply the vocabulary they have learned. This process proved to be consistent with the neurocognitive principles reviewed in the literature, confirming that when the strategy is implemented in a planned and intentional manner, its results are significantly positive.

Regarding the third specific objective, the consulted experts mentioned benefits and specific difficulties in the application of this strategy. Among the most relevant benefits, the following can be highlighted: better long-term retention of vocabulary, the development of the ability to differentiate semantic nuances between similar words, decrease in mechanical translation into the mother tongue, reinforcement of critical thinking and active learning, all in line with the principles of neuroplasticity. On the other hand, difficulties were also mentioned such as the time necessary for their design and implementation, the complications for teaching large groups with different levels of language proficiency and the initial learning curve when students are not familiar with the strategy.

Nevertheless, these challenges can be addressed through concrete actions such as careful planning, the use of visual resources and complementary digital tools, and constant teacher support that guides without replacing the student's active participation.

In conclusion, the present research has successfully met the stated objectives and has demonstrated that semantic mapping is a neurocognitive strategy that could be widely used in revolutionizing the vocabulary teaching in EFL contexts. This strategy reduces the cognitive load, reinforces semantic organization, and promotes long-term retention; therefore, it directly addresses the problem identified at the beginning of this study. This strategy is an effective and flexible pedagogical tool based on the knowledge of how the human brain operates.

Recommendations

Based on all the data obtained in this study, we offer some suggestions that teachers should keep in mind when implementing semantic mapping to enhance its effectiveness in developing vocabulary among EFL students.

First, the teacher must become a facilitator in the process: to guide the students in the construction of the semantic map and not to substitute their active participation. It is important to give timely feedback, to ask questions that activate previous knowledge and to create an environment of trust where students feel safe to search and connect new words with the ones they already know.

Second, three aspects must be carefully considered when designing a semantic mapping activity: the time available, potential group challenges, and the learning environment. The activity should be planned to ensure the equitable participation of all students, adapting to their different levels of language proficiency and learning styles, in order to create a space where everyone can contribute without feeling excluded or at a disadvantage.

Furthermore, based on the findings of this study, it is considered necessary to conduct further research that explores the use of semantic mapping from other perspectives. First, it would be valuable to conduct research focused on students' own perceptions of the implementation of this strategy, in order to understand how they experience it and what aspects they believe need improvement. Second, considering the technological dependence that many individuals have today, it is necessary to investigate how the use of semantic mapping can be combined with digital tools and artificial intelligence, such as virtual tutors or interactive platforms, to broaden its applicability and flexibility in different educational contexts. Third, it is necessary to investigate students of different levels of English proficiency, from beginners to

advanced, in order to measure the effectiveness of this strategy in each of them, and to know the adjustments that are required to maximize its impact. Finally, it is essential to investigate how semantic mapping can be combined with other language skills apart from vocabulary, such as reading comprehension, writing, and speaking, considering that the experts interviewed commented that this strategy also has positive effects on these skills within the EFL classroom.

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Annexes

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En calidad de tutor del Trabajo de Integración Curricular denominado **“SEMANTIC MAPPING AS A NEUROCOGNITIVE STRATEGY FOR EFL LEARNERS”** elaborado por las estudiantes **TOMALA FIGUEROA KARLA VALESKA AND RAMIREZ TENEMPAGUAY MARIO ISAAC** de la Carrera de Pedagogía de los Idiomas Nacionales y Extranjeros, de la Facultad de Ciencias de la Educación e Idiomas, de la Universidad Estatal Península de Santa Elena, me permito declarar que una vez analizado en el sistema anti plagio COMPILATIO, luego de haber cumplido los requerimientos exigidos de valoración, el presente trabajo de investigación, se encuentra con 2 % de la valoración permitida, por consiguiente se procede a emitir el informe.

Atentamente



Ing. Xavier Almeida Briones. MSc
TUTOR

Annex B: Questionnaire

Semantic Mapping as a Neurocognitive strategy for EFL learners

1. From your perspective, how do students respond when vocabulary is presented in a semantic mapping way in comparison with a traditional list in which words are presented?
2. Considering working memory, in which ways have you observed that semantic mapping helps students to process vocabulary much better without saturation?
3. Based on your teaching experience, what changes, if any, have you noticed in students' vocabulary retention after using semantic mapping activities?
4. The English language has many synonyms and nuances that sometimes confuse students, how does the use of semantic maps influence the ability in which students can organize and distinguish those nuances in their minds?
5. Would you mind describing step by step how you introduce and develop a semantic mapping activity for EFL learners?
6. In your teaching experience, what kinds of strategies or visual aids do you typically use or prefer for active vocabulary instruction?
7. From your academic perspective, what advantages do you think semantic mapping offers over traditional methods of memorizing word lists?
8. What challenges or limitations might teachers and students face when implementing semantic mapping in EFL classroom?

Annex C: Transcript from the interviews

QUESTION 1

From your perspective, how do students respond when vocabulary is presented in a semantic mapping way in comparison with a traditional list in which words are presented?

Interviewee 1.

Based on my experience, when I was a teacher in other levels, because at the university, I didn't use this kind of strategy, or whatever it is, or whatever you have, taking this into consideration for your research project. Based on my experience, students are far more receptive to vocabulary when we use semantic mapping than traditional. Why? Because when we use semantic mapping, they felt, so I'm talking about the past, more engaged and also curious. I think it's a good way of using when they try to understand better through the use of many words in context. Even that in traditional, they have just lists of words that most of the time traditional methods promote memorization, and it is difficult for students to memorize lists of words. While with semantic maps, learners are able to see how words work together, how words are related, and that tells them then something that is a meaningful experience. So that's my opinion.

I think the use of semantic mapping is a really good tool for teaching vocabulary.

Interviewee 2.

Okay, from my perspective, students always respond in a positive way. They are active when vocabulary is presented through this semantic mapping, rather than just a list of traditional words, right? So, semantic maps allow learners to establish these relationships amongst the concepts. So, it makes vocabulary learning more engaging, more meaningful. So, students tend to participate more in discussions. Students can make connections between known words and also new words, and they can demonstrate a deeper understanding of vocabulary. On the other hand,

once we present only traditional lists, it can encourage memorization, which may result into superficial learning, and also we can see how they present a lower level of engagement. That is my experience.

Interviewee 3.

OK. Students can appreciate the difference. That's the main point. Because, for example, if I have a lesson in a traditional way, they are forced to remember unlisted words. And it's hard for them to remember those words for the next class. Instead of using semantic mapping, because, you know, you can teach a vocabulary. For example, let's make the example of the restaurant. And they can imagine all the words that are linked with that word. For example, they think menu, meal, side dish, main dish. So this is easy for them to remember. So for me, it's a positive way to teach.

Interviewee 4.

Okay, I would like to start asking you first if you know what is neuroplasticity. If you don't, it's okay. Okay, that's basically what happens on the brain when... Well, you are the expert right here, so proceed with it. It's okay, don't worry. Well, neuroplasticity is how our brain has the capability or the ability to reorganize itself by forming new neural connections throughout life. This adaptability allows us to learn to recover from injuries and adjust to new experiences. Why am I mentioning this to you? Because there are two main types of neuroplasticity, functional plasticity and structural plasticity. And semantic map, I would like to start with this, is about structural plasticity because structural plasticity means the brain's capacity to physically change its structure in response to learning and experience. So, answering your question, students generally respond more in a positive way to semantic maps because it's not traditional,

as you mentioned, because it engages multiple areas, like in the brain, through the visual and relational nature, and it aligns with the principles of neuroplasticity, as I mentioned before. This engagement promotes deeper processing and helps us, our students, to see the connection between words, enhancing their understanding and recall the words.

Interviewee 5.

Okay, well, this is an interesting topic. In my experience, students usually respond better to semantic maps than to traditional vocabulary lists, for example. You organize the words visually, and if you connected them by categories or ideas, they seem more interesting and engaged. And on the other hand, for example, with traditional lists, many students try to memorize the words without really understanding the relationship that are between them. So, in this case, semantic maps help them to see how words are connected, which learning makes a lot of sense. It's more meaningful for them.

QUESTION 2

Considering working memory, in which ways have you observed that semantic mapping helps students to process vocabulary much better without saturation?

Interviewee 1.

Well, one of the biggest advantages of semantic mapping could be that it lowers the cognitive load for students. Learners do vocabulary, and when they do this kind of activity or this way of learning, they try to remember lots of words instead of single words, because the students are able to relate new words. For example, when I taught students in secondary levels, I usually asked them to choose one topic. I asked them the topic we're going to learn in next classes, so they could use different words taken from one by one, and we created a chain of words. And with that technique, it was really easy for them to use the vocabulary and process information

more effectively. So if we focus attention on how words are connected or which are the relationship between words rather than just memorizing, I think it's one of the biggest advantages of semantic mapping.

Interviewee 2.

I can say that also based on my experience, because we try to go in a deeper understanding of how they can process the information in a better way. So, I can say that in terms of this cognitive perspective, semantic mapping helps reduce this cognitive overlap, because if we fulfill a student with lots of information, this information can be inferred only as isolated items, but otherwise, if we organize this into meaningful categories, it could be more meaningful for them. So, when our students see these connections among the words, they can process vocabulary into chunks. So, this is more compatible with the limited capacity of working memory. So, as a result, our students are less likely to feel overwhelmed, and they are better able to understand and to retrieve new vocabulary. So, this visual structure, at the moment that you work with semantic maps, also serves as a scaffold that supports the information processing as well as the retention of the words.

Interviewee 3.

OK, for me, it is important that the students feel comfortable with the lesson. And the environment created initially. I mean, if I'm going to teach a new vocabulary, I try them to feel motivated. So I have to create a confident environment. I give them strategies or maybe the most appropriate resource. For example, if I'm going to talk about restaurants, I try to give them a menu and imagine maybe a video because they are really visually visual. And for me, this resource helps them to remember better the vocabulary. So if I have to have to reinforce something in the next class, they are going to remember better that vocabulary. And it avoids

wasting of time for for the lesson. You know what I mean? I try them to to can avoid translating also. And they feel confidence to talk. They feel confidence to communicate their main ideas using that vocabulary.

Interviewee 4.

Well, it helps reducing cognitive overload by organizing the vocabulary, by breaking down the complex information into manageable parts. Well, this method allows our students to focus on the relationship between words, which enhances comprehension and aids working memory. I like to describe semantic maps with an acronym. It is VOCA, that means visual representation, organizing of information, connection building, and active learning. What means visual representation? By using these visual elements, semantic maps, active our students' brain or the different parts in their brain to foster the new information and to make new neural connections. Why organize the organization of information? Because this breaks down the complex vocabulary into manageable parts, reducing cognitive overload and enhancing working memory. And the connection building, because creating semantic maps encourages students to draw connections between related concepts and also extending the existing neural pathways. And the last part of active learning, because it engages the students in the process of acquiring this new vocabulary.

Interviewee 5.

Yeah, well, first of all, semantic maps help students organize information from bigger groups into smaller groups. Instead of isolate words at once, for example. So, in this way, it seems that they reduce confusion, for example, and makes vocabulary easy to process. I mean, the new words are easy for them to process. So, they can focus on the connection between the

words, for example. And I mean, this helps them a lot to remember meanings or definitions without feeling overwhelmed or stressed.

QUESTION 3

Based on your teaching experience, what changes, if any, have you noticed in students' vocabulary retention after using semantic mapping activities?

Interviewee 1.

Let me remember. Yeah, so I am taking this experience based on when I was teaching in high school, and I think when I used this kind of way for helping my students retain vocabulary, it improved the vocabulary retention through the consistent use of semantic mapping. For example, students remember words more easily when they use the words in a context that sometimes are related to how they feel. So in that case, they tend to use a wider vocabulary and to retrieve it faster when they are in classrooms, discussions, debates, and writing activity. Semantic mapping's visual and relational nature seems to enhance long-term memory because students add meaning to every single word they use when they try to express something. So I think that semantic mapping must be connected to meaningful experiences that help them to retain vocabulary in order to produce what they already know based on any experience so it's easy to retain words.

Interviewee 2.

Well, as a teacher, I've observed improvements in vocabulary retention. And once we use progressively the semantic mapping, students tend to remember words for longer periods. So, it benefits to long-term memory, because they associate new vocabulary with existing knowledge and conceptual networks. So, they can create their own vocabulary. So, they are also more

capable of recalling vocabulary during speaking. So, it's easier for them to remember the information, to remember the words, not only in speaking, in writing, as well as in reading activities. So, if we compare to traditional memorization techniques, we can say that semantic mapping promotes deeper processing, which contributes to a stronger long-term memory retention.

Interviewee 3.

The retention students, students can link the words to other vocabulary so they avoid translating. They feel confidence and they obviously they are going to make mistakes. Nevertheless, they feel less shy and try to show or communicate the ideas using the words they remember. As I told you, they are really visual and they can connect. They can imagine the context for that vocabulary. And obviously you're going to remind what other words I have learned. How can I express that idea? And also they are like reinforcing their skills, their communicative skill, their speaking skill. And also they, I guess, I suppose this, but for me, they are like training their brain and they avoid translating as I told you. So they feel confidence to speak themselves, to express themselves, their ideas.

Interviewee 4.

Yeah, for sure. Not just the use of semantic maps, but also the use of brainstorming or visual representations. However, students tend to be more engaged in semantic map activities. They show significant improvement in vocabulary retention. And the use of this visual organization, of this visual representation, helps them, as I mentioned before, strengthen the neural pathways. It makes them easier to understand the words. It makes for them easier to comprehend the words. And also, when we finish the activity, they say, Oh, miss, I feel like

more comfortable and I feel like I understand, I understood, I'm sorry, I understood more. And it helps also to them to feel confident in their ability to remember and apply new words.

Interviewee 5.

Yeah, well, throughout the years, I have observed, for example, that students, they tend to remember vocabulary for a longer period of time when they learn it through these semantic maps. And, for example, they are able to recall words more easily during speaking or writing activities because they remember the category or they remember the concept where the word was placed in the first position. And the improvement for students, if I can recall the improvement for the students, it's not immediate. I mean, it's not overnight, okay? But overall, retention seems stronger compared to simple memorization, for example.

QUESTION 4

The English language has many synonyms and nuances that sometimes confuse students, how does the use of semantic maps influence the ability in which students can organize and distinguish those nuances in their minds?

Interviewee 1.

Well, I think that it is used especially when we use synonyms. We use synonyms and we try to make our students visually compare words. For example, if they want to produce a writing task, they try to connect one word with different synonyms and they use parallel writing. I remember that I used this kind of strategy when I taught parallelism writing. So students produce words taken from one into your synonyms and every one of them produces other paragraphs but they try to say exactly the same. So when we talk about a variety of intensity or a variety of things they want to express, most of the time they feel limited because of the lack of

vocabulary. We used semantic mapping based on synonyms. It was wide, it was broad. So the production was better and it helped them to have distinct meanings and uses.

For example, good students use different words. Students with low levels use words, maybe basic words, but they try to produce written tasks and express something. And they basically use the vocabulary, use grammar, use every single part of a written part and they already know what everything means. And even in speaking. So you know that speaking and writing are connected because it's a matter of how much everyone knows. If they could speak better, obviously they could write better too. And it was based on how synonyms and words connected with parallelisms in writing helped them improve both productive skills, speaking and writing.

Interviewee 2.

Semantic maps are particularly effective in helping students differentiate between synonyms, as well as related concepts, and these differences in meaning. But also, I like to remark that they have to understand the words in context. But as if this semantic map is good to make them create their own category of words. So, once they visually organize the vocabulary into categories and subcategories, so students can compare words according to the context, because we remark this always, and you have to define, you have to see the context of the words. So, not only the context, intensity, and the formality. So, for example, students can identify or distinguish the words such as happy, and please, delighted. So, by placing them along another words. So, this process enhances semantic awareness and helps students select more accurate vocabulary in communication. But we remark always that the context is the key.

Interviewee 3.

OK, for me, this comes to my mind a situation and I'm going to share this experience with you. For example, if I have a reading comprehension and it has a part with a new vocabulary, let's get it says Sarita has a big problem at school. So I try to my students feel, sorry, I try to my students can interpret this, how you can paraphrase this, how you can say this sentence in other words, with your own words. And obviously, we're going to pick up a word, take this word aside and we can create a brainstorming around this word. Let's suppose the word big. What means big? How do you can represent this word? What's synonym, you know, and you can say and you can involve your students to create a lesson, to create a vocabulary, to create a context of the of the lesson. And for example, they can say, oh, big means like a huge or they can say big, big is large. And this obviously it's going to to. Propose another context of those words, because, you know, all of these words are synonyms. Nevertheless, they have different context to use. So this is going to bring the students the opportunity to learn other situations in which they can use those synonyms.

Interviewee 4.

Well, these semantic maps are particularly effective in helping the students organize synonyms and nuance meanings visually. This representation will help the students to organize these words, as I mentioned, visually. And it allows them to distinguish the main difference between the words and categorize each word based on the context. This clarity gives them the opportunity to understand and use this new vocabulary, allowing them to express themselves in a more creative way.

Interviewee 5.

Yeah, for example, I'm going to give you examples for this question. Well, using semantic maps, you need to compare similar words and notice similar differences in the meaning. For example, if I give you the word happy or we're going to learn those kind of words, I can tell them more words similar to them. For example, pleased, delighted. It could also be the word excited. So, they can place them in the same semantic map and discuss the relationship between the words, but they are not exactly the same. So, this kind of visual organization, it helps to understand or make them understand more clearly the use of the words.

QUESTION 5

Would you mind describing step by step how you introduce and develop a semantic mapping activity for EFL learners?

Interviewee 1.

Yeah, based on that experience, I remember that I use words in a kind of chain words, what it means. For example, if I said food, they connect food with other words. So they create like a chain of words and that helps them to maintain the topic in the middle and the rest of the word around the same. And in order to produce it, in order to set what they try to express. And the students use brainstorming words that they already know. For example, if I write on the board, travel. Yeah, everyone produces words and they group all of them. And I ran in categories, so they could use topics and subtopics. And I remember that I used it when I taught a subject in English too. For example, I taught natural science and I remember that I taught the photosynthesis process. Yeah, and students produce words and photosynthesis was the root word, it wasn't the nucleus. And all of them came around and they produced better what they tried to or they understood. And also when, when I introduced new vocabulary, I have students decide which

word everyone fits on the mouth. For example, do you know parts of a plant? And the students said, for example, leave and where I categorize leave. So I started with different categories, one by one. And after I just connect all of them, try to provide them differences, similarities. And if students create their own semantic map individually or in groups, for example, where you understand based on what you see on the board. Based on the definition of photosynthesis, you can start talking about food or you can talk about root or leave or sign or any word. So the steps, I think, depending on the rank of the students and the level of proficiency level for them. And that is how I usually did it. And I use it in natural science. I remember in natural science was really useful studying for that. Rank of words and they try to understand or connect one by one, depending on how much they know.

Interviewee 2.

Well, typically, I can start my class when I'm going to teach vocabulary by introducing a central topic. Okay, so a key concept that is relevant to the lesson objective. So, first, I write a main concept in the center of the board, or if I am going to use a digital platform. So, second, I ask the students to brainstorm related words and ideas based on their prior knowledge. So, in this way, we activate this prior knowledge. Then, I organize vocabulary into categories and establish connection among words. We can play a game also in order to activate this prior knowledge. And then, so students can work collaboratively to expand the map by adding examples, synonyms, antonyms, or different information. All right. So, for example, let's see that we are going to teach a class of plans, celebrations. So, we can brainstorm some ideas related to, for example, we write down in the center. We can write or we can present a picture and also write, for example, wedding. So, we can ask the students in a semantic map, for example, about people, also about places, accessories, and things. So, in this way, we make them to work collaboratively

to expand the map. So, finally, the students use the completed semantic map in communicative activities. So, after this, we can make them to discuss or write a short paragraph or make a presentation or just work together in a reading comprehension activity to reinforce learning.

Interviewee 3.

OK, this is a pretty good question. OK, first of all, as I told you, students are really visual. Obviously, you have to plan your lesson. You have to give a little clue of what the lesson is going to train about. Yes, you can prepare an imagine if you have the resource, you can you can give them a video in which they can observe. After that, you're going to ask what they can appreciate and imagine. What can you appreciate from the video? And obviously, you're going to make a brainstorming with what they already know about that topic. For example, the example of the restaurant, they are serving a restaurant, something in the table, maybe the waiter. And they are going to they are going to give you the words they already know. So this gives you the opportunity as teacher to teach, obviously, other things they don't know. Yes. And after that, you can increase the vocabulary. Do you give them the activity? Obviously, you're going to release. And from this time, you have to give them the objective, the outcome you want to. They have to be ready at the end of the lesson. For example, I can say them at the end of the class. You have to tell me what what are you to. What are you what are your favorite dish or how you can how you can take an order. And they are going to be they are going to be ready to write the vocabulary to take notes of the vocabulary. They want to they want to use it to solve that outcome that you need from them. Yes. And obviously, at the end, you have to prepare an activity in which they can show you what they what they have done in that lesson.

Interviewee 4.

Okay, well. So, first, as a teacher, we know we have to plan our class. It's really important to know what we are going to teach in advance. So, what I do is plan in my lesson plan, which is the topic for the class. I prepare the material, and if we are going to read a text or a lecture, previously, I select the words. After that, we read the whole information in the group, and I guide them to choose the new words. I ask them, for example, which word do you know, or which are new for you? But I'm guiding, did you know this word? Do you know what this means? And after that, we can create this environment of participation. Then I explain them how to make or how to create this map, and after that, I make that key question. Do you know this word? Do you know what this word means? Or what do you think this word means? We create this semantic map, showing the connection between the words. After that, I love to create groups, because, okay, no more than three people in each group, of course. I make groups, and we pick three words, the difficult ones, and I ask them to create this semantic map. After that, we share and discuss all these ideas that they create in the semantic map, and at the end, we reflect on what have they created. That's how we conclude the activity. And doing all these steps, I know for sure that they learn the words, and that's the easiest way for them to understand and to apply the words in their daily life.

Interviewee 5.

Yeah, step-by-step. I mean, let me recall or let me remember some classes that I have taught. For example, I don't know, you go to the board and you write food, for example. You write the word food or you write the word trap, okay? And we can do some kind of brainstorming related to each topic, okay? So, when they start contributing with ideas or telling me, hey, Mr., example, food, fast food, junk food, okay? I help them or we as a class organize the words into categories, okay? And after that, after that we have identified the categories for

each group, then we make the students work in pairs, for example, or in groups to add more vocabulary and make connections between the words. And as an evaluation at the end, we can discuss the map, the semantic map, okay? And we can use those words they prepare in sentences, in conversations, or maybe writing short activities to reinforce that learning.

QUESTION 6

In your teaching experience, what kinds of strategies or visual aids do you typically use or prefer for active vocabulary instruction?

Interviewee 1.

Yeah, I mentioned it. Yeah, I change words. Yeah, I use I used to use a chain words in order to help my students connect all of them and try to produce something. And also, I remember I definitely remember that I had a resource that it was like that. I don't know how to say in Spanish, like Zapatera. I don't remember exactly how to say Zapatera, but it was a with plastic. It was made of plastic and the students had words written and they tried to create definitions and they ran and they put any word in any space and they create something. So I use a organizers. I use my I don't remember how to say Zapatera. Sorry. Yeah, Zapatera. And I and I use with them a different kind of strategy. For example, I use flashcards or word cards. And I put them on the on the floor and students by you try to connect words in order to produce something. And I think with those strategies, the vocabulary was learned more effectively. And when they visualized the words, they understood at the same moment what every single word means. And even if they didn't understand everything, probably I think 75% was just base of any definition and every one would produce definitions at the end of the hour. So there were many, many strategies. For example, Realia was another that I used a lot. Realia, you know, is real objects. Yeah. And I remember that I used to take them to the yard because we had a really wonderful

yard. I think it was a house next to our high school. And the students could see, could touch every single part, for example, of a tree or different parts of what I taught in that era about natural science. And I think it was one of the best strategies I could use because they could feel when they taught every single part or every single word, but in a natural environment. So I think that one of my best ways of using this kind of strategy was in natural science.

Interviewee 2.

Well, I usually use graphic organizers, semantic maps, my maps. I really like to work with word walls and also with flashcards, with visual materials. If we have access to technology, we also can apply digital applications, digital apps that can support this visual learning. So, we can also integrate other activities, for example, a project-based learning, collaborative tasks. So, among these strategies, semantic mapping stands out because it combines visual representation, cognitive organization, as well as active learner participation. So, you know that all are important factors in vocabulary acquisition.

Interviewee 3.

Visual resources for me is visual resources. As I told you, they are really visual. And in our in our subject, we need to express trying to avoid the translation. I don't tell you you're not going to translate specifically in public institutions. You have to leave the rule aside and translate sometimes. But nevertheless, you have to try to show them the meaning of what you are telling to them without translation. And the visual resources are a key element for the English class. You have to be prepared with flashcards, with pictures, with videos if it is necessary. So for me, the main the main resource you need is the visual, the visual tools.

Interviewee 4.

Well, I use a variety of strategies and visual aids, including charts, interactive games, and digital tools. I use the last one the most, because for me and for the students, it's more engaged for them. So, the ones I like the most is generally WordWall and Prezi, the digital tools, because these methods keep the students engaged and reinforce learning, and it promotes also the active participation with them. Which is for sure essential for effective vocabulary acquisition.

Interviewee 5.

Well, there are many strategies. I could use a lot of them or combine them, for example, pictures, graphic organizers, the typical flashcards, word banks, and also context-based activities, okay? And we also try to encourage students to create their own vocabulary notebooks in which they can include their definitions, examples. They can also draw what the word is about, and also they can connect in related words, okay? So, for example, visual aids like the flashcards and the word banks and the graphic organizers, they're especially helpful because they make vocabulary more memorable, so they can remember them after the class. And they can use them in real life. That's the purpose.

QUESTION 7

From your academic perspective, what advantages do you think semantic mapping offers over traditional methods of memorizing word lists?

Interviewee 1.

Semantic mapping improves deeper learning, both academically and practically. So typical words tend to be rote learning, but students sometimes learn and they use it for a short period of time and they don't remember after. However, when we use semantic mapping, they retain for more time.

And also, I think that the use of this semantic mapping helped them to understand really fast every single definition, every single word. And also, it helped teachers to create in our students consciousness. Why? Because if they can see, for example, this pen, they just try to create on their brain what is the definition without translating. So they just connect words and we connect previous knowledge with the knowledge that we are in that moment of class, we try to teach them. So this process encourages meaningful learning. And I think that a teacher who creates meaningful learning with semantic mapping will be a successful teacher in that moment because the students are not isolated from words to words. They are creating something that is meaningful and something that helps them to use the language in real context.

Interviewee 2.

Well, semantic mapping offers several advantages over this traditional memorization method. First of all, it promotes meaningful learning because it helps students understand relationships among the words rather than memorization in an isolated way, and second, it supports critical thinking and deeper cognitive processing, and we can say also that it facilitates long-term retention and retrieval of vocabulary, and we can also say that it encourages active participation and it fosters learner autonomy. So, finally, semantic mapping is aligned with constructivism, as well as neurocognitive principles. So, when learners actively construct their knowledge by connecting new information to existing mental schemes, so we can say that we foster meaningful learning.

Interviewee 3.

For me, the advantage that it offers is give confidence to students. That's the main advantage, because, you know, mental mapping helps them to create the vocabulary they already

learn. They need to learn. And with that vocabulary, they feel less shy, as I told you, to express themselves. Another thing I can tell you is that they can reinforce their visual memory and it avoids translating. It helps to students avoid translating. And for me, that's the main point. OK.

Interviewee 4.

Well, I got three in mind. First, it promotes deeper comprehension by illustrating the relationship between words. It keeps students engaged through visual and interactive elements, and it strengthens memory retention by creating visual representations that are easier to recall or to understand. And all this that I mentioned to you aligns with the principle of neuroplasticity that I mentioned to you in the beginning of the interview, because it fosters the brain's ability to adapt and reorganize.

Interviewee 5.

Well, it's very simple. Semantic mapping promotes understanding rather than simple memorization. If you're not using this technique, you're only teaching them how to memorize words, but they're not understanding how to use them. So, using this technique, you can see relationships among the words and connect them to new vocabulary, okay? So, it encourages active participation and critical thinking. So, in contrast with traditional word lists that can lead students to memorize vocabulary temporarily, you know, semantic mapping, they teach them how to really understand the meaning of the word. And not just the meaning, how to use them, okay? How to relate more words.

QUESTION 8

What challenges or limitations might teachers and students face when implementing semantic mapping in EFL classroom?

Interviewee 1.

Basically, as any other strategy or method or technique, there are some challenges. One of the most common limitations our students sometimes are limited by lack of vocabulary or different levels of proficiency. So I think it would be one of the biggest limitations or challenge in order to help our students who were, for example, if they were in a low level and you're having the same classroom, big group of students, and in this case there are students with a high level and students with low level. I think that teachers have this challenge, for example, try to help them improve and at the same time, the students who are in a higher level, probably they get bored. So when we use semantic mapping, we can organize information and try or we need to provide clear guidance to students who are limited or students with low levels and clarify probably more than once. And it helps students who are limited based on lack of vocabulary or students who haven't developed the skills at the same level of the other ones and try to categorize them too. And there are many high schools that work with that kind of style for learners. However, not all the schools allow it. So in that case, it can be difficult to manage collaborative mapping activities when you have different levels. However, with regular practice, with clarification, and with scaffolding, these difficulties can be overcome. So I think one of the benefits of our way of limitation using semantic mapping are not easy, but it has a difficulty, but it's able to overcome. So I think that limitations can be just used based on our students' needs when we analyze our students' needs and we compare with how or what I want to teach them. I could find those challenges something that probably students would not realize how difficult it would be learning. They just would follow teachers in order to improve their levels.

Interviewee 2.

Well, I think that one of the main challenges is that once we create effective semantic maps, so it requires careful planning, especially when students are unfamiliar with the strategy,

when they do not know this strategy, so some learners may initially struggle to identify relationships among the concepts or they may need guidance to organize information or maybe they struggle at identifying the relationship among the words and also the concepts. So, in addition, large classes can make collaborative mapping activities more difficult to manage, so teachers also require training to design these meaningful semantic mapping activities that can be aligned with learning objectives. So, despite all of these challenges, and we need to remark the educational benefits generally, highlighting the limitations when the strategy is implemented appropriately.

Interviewee 3.

If you are a traditional teacher, the main the main disadvantage you're going to find is that the students are used to a rhythm of lesson. If you want to create the semantic mental mapping in your lesson, you have to be prepared with a with timings. Yes, you have to give them a time to create the brainstorming, for example. So you have to be very, very organized with your time. For me, the real challenge is to show your students this new method.

Interviewee 4.

The first I would like to mention is that time-consuming for us as a teacher and also for the students, because we need to prepare, as I mentioned to you before, we need to prepare this for the class. And at the moment that we are making the groups, we are creating all these visual representations. It's time-consuming for us. And also that there are many students that do not feel comfortable with this type of method, let me say, because they prefer the traditional one that is learn the word and the meaning. And one important or interesting thing to keep in mind is that it's really important to balance visual methods with other teaching strategies to accommodate different learning styles, ensuring that all the students feel part of the learning process, all the

students feel that they can benefit from the instruction of creating this semantic map. That's all that I can say.

Interviewee 5.

Yeah, well, what are the challenges and limitations? Well, yeah, there are some limitations. There is one challenge, per se. It can take more classroom time than just presenting the vocabulary list. It takes time building all this, you know, like brainstorming at first and making them write or relate words. It takes a lot of the classroom time, okay? And at some point, some students may also need some guidance because, at the beginning, because they are not familiar with organizing information visually, okay? So, that's one challenge, okay? Try to organize the classroom time. And maybe one limitation is that if you have a large class, making groups of discussion could be more difficult. If you have a big class, for example, if you're having like 50 students, 60 students, it's going to be difficult to create groups, for example, or group of discussions to interact between themselves. However, if you start doing this, if you start practicing this and you make a proper planning, for example, these challenges could be managed effectively.