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Applying Semantic Theory Framework to Teaching Vocabulary of English for Medical Purposes at Vietnam Military Medical University

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Abstract

This study explores the application of semantic theory in teaching vocabulary of English for medical purposes (ESP-Med) at Vietnam Military Medical University (VMMU). The objective is to enhance vocabulary acquisition through innovative teaching methodologies. A survey of 297 students and 14 instructors was conducted to assess current teaching practices and their effectiveness. Based on the collected data, the study applies three semantic approaches proposed by Daniël & Panos (2028): Referential Approach, Relational Approach, and Denotational Approach. These approaches are integrated into teaching practices to promote contextual learning, lexical associations, and semantic mapping, thereby improving vocabulary retention and comprehension. The findings reveal that the systematic application of semantic theory significantly enhances students' ability to retain and use medical vocabulary. A comparison between the experimental and control groups demonstrates that these approaches facilitate long-term memory retention and the effective use of specialized terminology. Several challenges are identified, including limited instructional time, inadequate vocabulary learning strategies, and students' reliance on rote memorization rather than active learning. Additionally, the study underscores the importance of adopting teaching methods that align with academic and professional needs. The incorporation of multimodal learning tools such as interactive exercises, real-life scenarios, and visual aids further supports vocabulary acquisition. The research also recommends integrating digital technologies, including artificial intelligence, adaptive learning systems, and virtual simulations, to optimize teaching and learning outcomes. These findings contribute to enhancing ESP-Med instruction, ultimately improving students' academic and professional competencies in the military and medical fields.

Keywords: semantic theory, English for Medical Purposes (ESP-Med), referential approach, relational approach, denotational approach

1. Introduction

Vocabulary acquisition is an essential component of language learning, contributing significantly to the success of acquiring a second language. The importance of vocabulary learning is well illustrated by Wilkins' assertion: "Without grammar, very little can be conveyed; without vocabulary, nothing can be conveyed" (Wilkins, 1972). Similarly, Fan (2003, p. 222) emphasized that "vocabulary is the largest component of meaning in any language."

Extensive research has been conducted to explore effective approaches for both learners and instructors in language education. However, differences in vocabulary teaching and learning approaches in English for Specific Purposes (ESP) remain a critical research gap, particularly in the field of medicine. As Donesch-Jezo (2014) pointed out, medical students have a strong motivation to enhance their specialized vocabulary knowledge due to their awareness of the role and benefits of ESP-Med in their professional careers. Hence, effective specialized vocabulary instruction is one of the primary responsibilities of ESP teachers. Research has indicated that teaching vocabulary for medical students requires a distinct approach from general English instruction due to its emphasis on domain-specific terminology (Oxford, 2001; Oxford & Nyikos, 1989). ESP instruction is demand-driven and goal-oriented, catering to learners' specific needs (Esmail et al., 2017). Thus, course materials must be tailored to meet the particular requirements of medical students. Proficiency in ESP-Med is crucial for healthcare professionals in reading medical literature, presenting at conferences, engaging in discussions, giving instructions to staff, and communicating effectively with patients and their families. Moreover, studies have suggested that specialized vocabulary learning should be context-based, focusing on professional environments such as hospitals,

surgical rooms, medical departments, diagnostic procedures, and medical conditions. Existing research has highlighted the challenges faced by both learners and educators in acquiring vocabulary of ESP-Med, particularly in Vietnam, where ESP is becoming increasingly vital in the healthcare sector (Lê Hồ Bảo Châu & Lâm Thị Thủy Tiên, 2020; Nguyễn Hưng Hòa, Phan Hoàng Trọng & Nguyễn Văn Chinh, 2015).

At VMMU, the need for ESP-Med proficiency has increased due to the growing integration of international medical research and professional collaboration. Since 2019, VMMU has reformed its curriculum, emphasizing communicative English and proficiency uses in ESP-Med. Despite these efforts, several challenges persist, including limited instructional time, large class sizes, and the continued reliance on traditional rote memorization, which restricts long-term vocabulary retention and practical application. To address these challenges, this study proposes integrating semantic theory into ESP-Med instruction at VMMU by applying referential, relational, and denotational approaches (proposed by Daniël & Panos, 2018) to enhance vocabulary learning, retention, and application. Given the increasing global demand for medical professionals to communicate effectively in English, optimizing ESP-Med instruction at VMMU is both timely and essential. The findings will contribute to future curriculum development, offering a more systematic and effective approach to medical English instruction, ultimately improving students' professional competencies and communication skills in the medical field. By applying a systematic, theory-based approach, this study seeks to improve both teaching effectiveness and learning outcomes, providing a structured methodology for ESP-Med vocabulary instruction in medical education.

The research is structured into four key sections. The first section serves as the Introduction. The second section focuses on building the study's theoretical foundation, revisiting fundamental concepts in semantic theory and examining three primary approaches pertinent to the research, which together establish the theoretical framework. The third section outlines the research methodology, detailing data collection procedures and analysis methods. It describes how data were gathered and analyzed through questionnaires, surveys, and ESP-Med test outcomes. The fourth section presents the study's findings and discussions, highlighting a comparative analysis of the two participant groups involved in the research. Finally, the fifth section summarizes the core results and offers broad conclusions regarding the teaching and learning of ESP-Med.

2. Literature Review

2.1 Semantic Theory in Language Teaching

As a key discipline within linguistics, semantic theory investigates how meanings are constructed and interpreted, especially through the dynamic relationships among words in varied linguistic environments. Daniël & Panos (2018, p. 9) define semantics as "the study of meaning in words and how these meanings interconnect within a linguistic system." Scholars such as Trier (1931) and Lyons (1995) further classify vocabulary into semantic fields, where words with similar meanings are grouped based on their interrelatedness. Semantic-based teaching strategies promote meaningful learning by emphasizing cognitive engagement over mechanical memorization, which in turn enhances sustained vocabulary acquisition and understanding (Saragih, 2019; Adakhiel, 2021; Wang, 2023).

In the context of ESP-Med, semantics plays a crucial role in enhancing medical vocabulary acquisition and retention. In medical English learning, it is essential for students to comprehend not just individual lexical meanings but also how terms function contextually and relate to each other within clinical discourse. Hurford (2007) conceptualizes vocabulary as an organized network in which words are interconnected by meaning, rather than being arbitrarily grouped. However, despite the vast literature on semantics in language acquisition, few studies have explored its application in medical English education, particularly in military medical institutions like VMMU. To bridge this gap, this research applies three core semantic approaches to teaching ESP-Med vocabulary, aiming to enhance students' vocabulary learning strategies and long-term retention.

2.2 The Three Core Approaches in Semantic-Based Vocabulary Instruction

The study currently identifies and applies three fundamental semantic approaches, namely the Referential Approach, the Relational Approach and the Denotational Approach. Each of these approaches is grounded in linguistic and cognitive theories, contributing to more effective vocabulary learning strategies in ESP-Med.

2.2.1 Referential Approach (RA)

RA (also known as the "Referential Theory of Meaning") is based on the principle that words derive their meanings from real-world objects and concepts (Daniël & Panos, 2018). This approach focuses on linking vocabulary to visual and tangible references, making abstract medical terms easier to comprehend and retain. RA is widely used in medical terminology acquisition by associating words with visual aids, anatomical models, and medical imagery. Studies have shown that medical students retain and recall vocabulary more effectively when terms are associated with visual representations (Evan, Dooley & Tran, 2011). Key techniques include:

- *Picture Grouping*: Organizing vocabulary by linking it to images of body parts, medical instruments, or pathological conditions (Božena, 2013; Yesim & Nurcihan, 2013).
- *The Picture Labeling:* Method uses images to link words with real objects, aiding vocabulary learning. Amer (2019) and Yulianti (2007) found that using semantic analysis and real-life images enhances vocabulary retention and motivation. Both studies confirm that visuals are an effective and flexible tool for improving vocabulary learning.
- *Mind Mapping:* Creating semantic networks that connect medical terms with their anatomical or functional relevance (Amer, 2019).
- *Real-World Contextualization:* Using case studies and clinical scenarios to reinforce vocabulary understanding (Yulianti, 2007).

In fact, there are a number of supporting research studies that have shown the effectiveness of RA. Research by Saragih (2019) and Adakhiel (2021) demonstrates that RA enhances long-term vocabulary retention by activating visual and spatial memory networks. The method is particularly effective in ESP-Med because medical concepts are inherently tied to physical structures and observable phenomena. However, one limitation is that not all medical vocabulary can be visually represented, especially abstract terms related to diseases, diagnoses, and physiological processes. To address this, a hybrid approach combining referential and relational methods is recommended.

2.2.2 Relational Approach (RLA)

RLA focuses on the semantic relationships between words, emphasizing synonyms, antonyms, hypernyms, and hyponyms. This method helps learners understand how words function together within a medical domain, improving recall and contextual usage. In fact, medical vocabulary is often highly specialized and hierarchical, making relational connections critical for effective learning. Techniques used in this approach include:

- *Synonym and Antonym Pairing:* synonym examples include "Hypertension" and "High Blood Pressure", both referring to elevated blood pressure; and "Cephalalgia" and "Headache", both describing pain and discomfort in the head region. In contrast, antonyms are words with opposite meanings. In medical language, they highlight contrasting conditions or concepts. Examples include "Diagnosis" and "Prognosis"—where diagnosis refers to identifying a disease, while prognosis predicts its course and outcome. Another example is "Acute" and "Chronic"—where acute describes a sudden, short-term condition, while chronic refers to a long-lasting or persistent health issue.

Khan's (2016) framework builds on prior linguistic research, integrating various semantic learning strategies to enhance vocabulary retention. Three commonly applied methods in ESP-Med teaching include:

- *Word Parts (Prefix-Suffix Method)* – Medical terms are analyzed based on their root words, prefixes, and suffixes to derive meaning. For example, "incurable" consists of "in-" (not), "cure" (heal), and "-able" (possible), meaning a condition that cannot be cured (Gamal, 2013; Zahra & Maryam, 2015).
- *Eponyms (Naming by Discovery)* – Some medical terms honor scientists, locations, or objects associated with a discovery (Gamal, 2013, p. 236). Examples include "Vaccine" (from vacca, Latin for cow, linked to early smallpox research), "Ephedrine" (from the Ephedra plant), and "Nicotine" (named after Jean Nicot, who introduced tobacco to France) (Ave, 2012, p.6).

Thus, lexical and semantic field theories support the cognitive advantages of relational learning, emphasizing that words are not learned in isolation but as part of a structured system (Lyons, 1995; Hurford, 2007). Studies by Wang (2023) and Saragih (2019) reveal that students trained with the RLA exhibit better retention rates and improved ability to infer unknown medical terms from context. However, this approach requires higher cognitive processing, making it more effective for advanced learners. Beginners may struggle if they lack foundational knowledge of medical vocabulary. Therefore, combining RA and RLA can provide a scaffolded learning experience.

2.2.3 Denotational Approach (DA)

The Denotational Approach regards each lexical item as bearing a precise, contextually grounded semantic load that conveys its core meaning. This approach emphasizes real-world experiences and contextual learning, enabling students to associate vocabulary with practical situations. In ESP-Med, DA is widely applied in categorizing words related to specific semantic fields. For instance, when learning about medical specialists, students explore related terms such as Cardiologist (heart specialist), Neurologist (brain specialist), and Pediatrician (child specialist). This classification helps learners establish connections between words and their practical applications. This approach is widely applied in medical English training through:

- *Semantic Mapping*, a visual representation of word relationships: Erikson (2019) applied semantic

mapping – a visual strategy to display inter-word relationships – to assist medical students in structuring and memorizing domain-specific vocabulary. This method structures information graphically, illustrating the hierarchical relationships between key medical terms. Jonassen (1993, p. 98) defines semantic mapping as a cognitive tool that visually represents how concepts are interrelated. By engaging in mapping activities, students reinforce their ability to link newly learned words to existing knowledge, fostering deeper understanding and retention.

- *Contextual Learning*, aligns with Halliday & Matthiessen's (2004) theory that define that word meanings are shaped by social and ecological environments. Graham (1995) notes that the meaning of vocabulary is constructed through its interaction with real-life usage, underscoring the importance of context-based practice for lasting retention. In medical English, this can be applied through role-playing and situational exercises. For example, to learn injury-related vocabulary (e.g., broken wrist, elbow sprain), students participate in role-play activities where they apply terms in realistic doctor-patient interactions (Evan, Dooley & Tran, 2011, p. 11). Moreover, Schmitt (1997) and Jiang (2004) emphasize that accurate denotational understanding is vital for professional communication in healthcare. While the DA excels at teaching specialized terminology, it may offer lower engagement levels when contrasted with visual or relational techniques. For optimal results, DA should be integrated with interactive strategies, such as problem-based learning and case-based discussions.

3. Methodology

3.1 Scope of Data Collection

This study investigates the effectiveness of different vocabulary teaching approaches in ESP-Med at VMMU. The data collection focuses on 297 students enrolled in ESP-Med courses (Term 7 and Term 8) and 14 instructors teaching these courses. The student participants were divided into two groups: experimental and control, allowing for comparative analysis. The selection criteria ensured that all students had completed Term 7, providing a uniform knowledge baseline. The research also considers teaching materials, lesson plans, and supplementary exercises designed to reinforce medical vocabulary learning. Additionally, contextual factors such as students' learning habits, instructors' teaching strategies, and classroom interactions were analyzed to assess how various teaching approaches influenced vocabulary retention and comprehension.

3.2 Data Collection Procedures

The study employed a mixed-methods approach, integrating both quantitative and qualitative data collection techniques. The data were gathered through the following methods: The data were gathered through the following methods:

- *Surveys:* The survey contained closed-ended questions to measure learning outcomes, preferences, and challenges; and open-ended questions to allow participants to elaborate on their experiences and perceptions. The survey is designed in Microsoft Word and includes two set of questionnaires: (1) Survey on the current teaching practices of ESP-Med vocabulary by instructors; (2) Survey on the current learning practices of ESP vocabulary by students. The questions are closed-ended, using a 5-point Likert scale ranging from "Never" to "Very often". This survey is based on the model of Jasmina & Čizmić (2018) and incorporates elements from Erikson (2019) to ensure reliability and relevance.
- *Classroom Observations:* Observations were carried out in ESP-Med classes to document student engagement in vocabulary learning activities, instructor-led teaching strategies and how they influenced student interaction and effectiveness of exercises based on semantic theory, including referential, relational, and denotational approaches.
- *Test Score Analysis:* Students' test scores from Term 7 and Term 8 were collected and analyzed to assess the improvements in vocabulary retention due to different instructional methods and comparison of semantic-based approaches vs. traditional rote learning

3.3 Aspects of Data Analysis

Data analysis focused on identifying patterns and correlations between teaching approaches and vocabulary retention rates. Quantitative data from survey responses and test scores were processed using statistical analysis to determine the significance of the observed differences between the experimental and control groups. Descriptive statistics (mean, standard deviation, and frequency analysis) were used to summarize students' performance trends. Additionally, comparative analysis was conducted on the ESP-Med test results to evaluate the effectiveness of semantic-based vocabulary instruction. Qualitative data from interviews and classroom observations were analyzed using thematic coding, allowing for an in-depth understanding of students' learning experiences and

challenges. The findings were synthesized to provide pedagogical recommendations for improving ESP-Med vocabulary instruction at VMMU.

In short, the analysis is structured as follows:

1. An analysis of current teaching and learning methods examines the current vocabulary teaching and learning practices at VMMU by analyzing survey and interview data from students and instructors. The study identifies:

- The most and least frequently used approaches by both teachers and students.
- Gaps between students' vocabulary learning strategies and teachers' instructional methods.

Statistical methods are applied to measure frequency distributions, highlighting discrepancies in method preference and effectiveness. The results provide insights into which approaches are underutilized and need further enhancement.

2. An analysis of the effectiveness of three semantic-based approaches evaluates the impact of RA, RLA and DA introduced through the supplementary exercises. The effectiveness of these approaches is assessed using:

- Comparative statistical analysis of ESP-Med test of Term 7 & Term 8 between the experimental and control groups.
- Percentage-based performance improvements, analyzing how well students retained and applied vocabulary after instruction using each approach.
- Classroom observations, which provide qualitative insights into student engagement, motivation, and perceived difficulty of the methods.

4. Results and Discussion

4.1 The Analysis for the Current State of Teaching and Learning Approaches in ESP-Med Vocabulary at VMMU

This section presents the results of the survey conducted to examine the teaching methods and vocabulary learning strategies of ESP-Med at the VMMU. The collected data were analyzed to assess the frequency, effectiveness, and alignment of instructional approaches with students' learning habits. This analysis provides a foundation for designing supplementary materials aimed at enhancing the practical application and retention of ESP-Med vocabulary. The ESP-Med vocabulary teaching methods and learning strategies were categorized into three major reference groups, corresponding to the three semantic-based approaches in the study's theoretical framework. The data were analyzed using the average frequency rate to compare the most and least frequently applied methods among the 14 participating instructors and 297 ESP-Med students.

4.1.1 The Analysis for the Current State of Methods and Approaches Used by Instructors in Teaching ESP-Med Vocabulary at VMMU

As can be seen from Table 1, Category B (Formal Learning Activities) accounts for the majority of teaching habits used by instructors, with an AFS of 10. The remaining two categories, Category A (Guided Self-Study Activities) and Category C (Incidental Learning Activities), rank second and third, with AFS scores of 5.0 and 3.8, respectively.

Table 1. Frequency-Based Classification of Teaching Methods Used by Instructors (n=14); Average Frequency Score for Each Method

METHODS		Nº of CAT	TC	AFS	Rank
CAT A	Guided self-study activities	A1 – A13	70	5.0	2
CAT B	Formal learning activities	B1 – B13	140	10	1
CAT C	Incidental learning activities	C1 – C13	53	3.8	3

Note. Category (CAT); Total Count (TC); Average Frequency Score (AFS)

Specifically, Table 1 accurately reflects the reality of teaching practices, as the majority of instructors tend to focus their time on classroom teaching activities, directly guiding students on the most effective strategies and techniques for learning ESP-Med vocabulary (Nguyễn Thanh Nga, 2012 & 2014 a&b). This is understandable since both instructors and students maximize the limited in-class time with intensive teaching to meet the curriculum schedule. Self-study guidance activities and incidental learning activities are only briefly integrated into classroom instruction. Furthermore, Category C – Incidental Learning Activities accounted for a very small percentage due to the limited exposure of students at VMMU to English-language input. Their restricted access to smart devices

and the internet limits their opportunities for passive learning. Category A – Guided Self-Study Activities, despite ranking second among the three categories, has not been fully exploited by instructors. For example, mind mapping, a highly effective strategy for learning ESP vocabulary (subcategory A11), was taught to only about half of the instructors' students.

While Table 1 provides a general overview and classification of the frequency of ESP-Med vocabulary teaching methods employed by instructors, Table 2 shows a general overview and classification of the teaching approaches employed by instructors for ESP-Med vocabulary instruction.

It is evident that the RLA is the most widely used among instructors, with an AFS of 7.4. The other two approaches, the DA and the RA, ranked second and third, with AFS scores of 6.0 and 5.4, respectively.

Table 2. Classification by Teaching Approaches Used by Instructors (n=14); Average Frequency Score for Each Approach

Approach	CAT	TC	AFS	Rank
RA	A [1 (36%), 3 (57%), 5 (36%), 6 (50%), 9 (64%), 13 (0%)] B [7 (43%), 10 (64%), 11 (93%)] C [1 (0%), 8 (36%), 9 (21%), 11 (43%)]	76	5.4	3
RLA	A [2 (50%), 8 (21%), 10 (79%), 11 (43%), 12 (14%)] B [1 (64%), 3 (86%), 4 (50%), 5 (93%), 12 (100%), 13 (100%)] C [7 (21%), 10 (14%)]	103	7.4	1
DA	A [4 (29%), 7 (21%)] B [2 (71%), 6 (100%), 8 (57%), 9 (79%)] C [2 (21%), 3 (36%), 4 (29%), 5 (64%), 6 (36%), 12 (36%), 13 (21%)]	84	6.0	2

Note. Referential Approach (RA), Relational Approach (RLA); Denotational Approach (DA); Category (CAT); Total Count (TC); Average Frequency Score (AFS)

Table 2 demonstrates that the RLA is the most frequently used approach, particularly in subcategories that align with traditional ESP-Med teaching methods, such as:

- A10 (*Students memorize words by learning synonyms, antonyms, and related terms* – 79%);
- B3 (*Students create word lists and translate meanings into their native language* – 86%);
- B12 (*When reading or listening to a passage, students attempt to infer the meanings of unfamiliar words before consulting a dictionary* – 100%);
- B13 (*Students learn words by studying prefixes, suffixes, and root words* – 100%).

However, other subcategories within different approaches received very little attention, such as

- A12 (*Students remember words by recalling the first letter of each word*);
- A8 (*Students associate new words with previously learned vocabulary*);
- C7 (*Students self-test by translating their native language into English whenever exposed to English-language input*).

These methods were chosen by only around 20% of the instructors. Similar findings were reported in previous studies (Gu & Johnson, 1996), which also concluded that traditional learning methods—such as translating into the native language, using bilingual dictionaries, and breaking down words by prefix, suffix, and root—are highly effective for memorizing ESP vocabulary.

A significant reliance on dictionaries (B1: 64% and B5: 93%) was observed, as many instructors considered it an essential tool for learning new words. However, this reliance highlights a persistent overdependence on dictionaries, which has not yet been overcome. This approach contradicts the academy's policy of prioritizing communicative strategies in ESP instruction. Using dictionaries as the primary learning strategy remains a passive learning method and should be reformed to improve long-term retention of target language vocabulary.

During direct interviews, most instructors acknowledged the importance of interactive, communicative learning strategies for vocabulary acquisition but also emphasized the need to maintain traditional learning strategies. This suggests that an integrated approach, combining both traditional and modern methods, is the most effective. Although this study does not delve deeper into this aspect due to its scope, it could serve as a potential research topic for future investigations. Our study primarily focuses on identifying the most and least frequently used vocabulary teaching strategies among instructors and examining whether instructors' preferred approaches align with students' actual ESP-Med vocabulary learning habits.

In summary, RLA was widely used because of its practical applications in large ESP-Med classrooms. Given the high student-to-teacher ratio, instructors prefer RLA strategies as they facilitate consistent vocabulary instruction across all students. This finding reinforces the idea that effective vocabulary instruction, much like English language teaching in general, must incorporate realistic, high-impact methods to achieve optimal learning outcomes.

4.1.2 The analysis for the current state of strategies and approaches used by students in learning ESP-Med vocabulary at VMMU

Table 3. Frequency-Based Classification of Learning Strategies Used by Students (n=297); Average Frequency Score for Each Strategy

	STRATEGIES	Nº of CAT	TC	AFS	Rank
CAT A	Self-study activities	A1 – A13	1486	5.0	2
CAT B	Formal learning activities	B1 – B13	1676	5.6	1
CAT C	Incidental learning activities	C1 – C13	905	3.0	3

Note. Category (CAT); Total Count (TC); Average Frequency Score (AFS)

It is evident that Category A (Self-Study Activities) and Category B (Formal Learning Activities) have relatively similar average frequency scores (ranging from 5.0 to 5.6). Although Category B has a slightly higher AFS, both categories account for only about half of the total students surveyed. Category C (Incidental Learning Activities) has the lowest proportion, with a AFS below 30% of the total student population using these strategies. Table 3 indicates that students' choice of learning activities is largely influenced by the guidance of instructors in class. Their independence and self-study capabilities remain limited. Notably, learning through natural sources such as the internet, books, newspapers, and ESP-related journals, as well as contextual learning applications, has not been effectively utilized by students. This can be explained by practical constraints:

- Large class sizes
- Limited in-class time
- Instructors being unable to dedicate extensive time to individual students

As a result, students struggle to independently develop flexible and effective vocabulary learning strategies.

While Table 3 provides a general overview and classification of the frequency of ESP-Med vocabulary learning strategies used by students (n=297). Table 4 shows a general overview and classification of the learning approaches employed by students for ESP-Med vocabulary learning.

Table 4. Classification by Learning Approaches Used by Students (n=297); Average Frequency Score for Each Approach

Approach	CAT	TC	AFS	Rank
RA	A [1 (33%), 3 (57%), 5 (29%), 6 (28%), 9 (80%), 13 (20%)] B [7 (38%), 10 (4%), 11 (9%)] C [1 (10%), 8 (46%), 9 (11%), 11 (53%)]	1246	4.2	2
RLA	A [2 (51%), 8 (15%), 10 (89%), 11 (34%), 12 (32%)] B [1 (100%), 3 (42%), 4 (53%), 5 (19%), 12 (75%), 13 (96%)]	1971	6.6	1

Approach	CAT	TC	AFS	Rank
	C [7 (50%), 10 (6%)]			
	A [4 (10%), 7 (21%)]			
DA	B [2 (53%), 6 (46%), 8 (18%), 9 (10%)]	850	2.8	3
	C [2 (24%), 3 (31%), 4 (17%), 5 (12%), 6 (2%), 12 (31%), 13 (10%)]			

Note. Referential Approach (RA), Relational Approach (RLA); Denotational Approach (DA); Category (CAT); Total Count (TC); Average Frequency Score (AFS)

Similar to instructors, the RLA was the most commonly used by students, with an AFS of 6.6. However, the RA and DA ranked second and third, with AFS scores of 4.2 and 2.8, respectively. Table 4 shows that RLA was the most frequently used approach among students, particularly in subcategories that align with traditional ESP-Med vocabulary learning methods. Students predominantly chose a few traditional vocabulary learning strategies, such as:

- Using bilingual dictionaries (B1: "*If I do not understand a word, I look it up in a bilingual dictionary*" – 100% of students selected this method.);
- Learning words by studying prefixes, suffixes, and root words (96% of students selected this method.);
- Learning synonyms, related words, and antonyms (A10 – 89% of students selected this method.

Other related subcategories, such as

- A8 ("*I associate new words with previously learned words.*");
- C7 ("*I test myself by translating from my native language to English whenever I encounter English-language input.*").

These methods, which are closely linked to translation-based learning, were consistently chosen by 50% of students.

For DA, the most popular learning method involved memorization through images (A9 – nearly 80% of students selected this method). Additionally, subcategories:

- A3 ("*I associate the word with a corresponding object to remember it.*");
- C11 ("*I read aloud and repeatedly when encountering a new word to remember its spelling and written form.*")

Each was chosen by about half of the students. However, most other subcategories under RA fell below the average selection rate, with B10 ("*I create vocabulary flashcards categorized by word groups or images.*") being the least preferred method, chosen by only 4% of students. Among the three approaches, DA ranked last, with less than one-third of students opting for it.

- All subcategories under DA were below the average selection threshold, except for B2 ("*I self-test vocabulary retention using word lists.*");
- Notably, C6 ("*I try to use new words in speaking and writing.*") had the lowest selection rate, with only 5 students (2%) choosing this method.

4.1.3 The Comparison of the Three Approaches Used in Teaching and Learning ESP-Med Vocabulary at VMMU

The results derived from Tables 2 and 4 reveal a shared preference for the Relational Approach (RLA) among both teachers and students in their respective ESP-Med vocabulary practices. The ASF was 7.4 for instructors and 6.6 for learners. That said, a contrast emerges between the two groups: educators were more inclined toward the Denotational Approach (AFS 6.0) than the Referential one (AFS 5.4), whereas students demonstrated a reverse tendency, favoring RA (AFS 4.2) and showing lower engagement with DA (AFS 2.8).

In terms of RLA, there is the most preferred approach among both groups. Despite some commonalities, significant differences in approach selection were observed. In particular, the two subcategories, A2 (*translating a phrase into the native language for understanding*) and B13 (*learning words through prefixes, suffixes, and root words*), showed comparable selection rates among instructors and learners (50% & 100% vs. 50% & 96%). However, major discrepancies appeared in subcategories such as: B1 (*using bilingual dictionaries*): 64% of instructors vs. 100% of learners; B5 (*using English-English dictionaries to reinforce vocabulary*): 93% of instructors vs. 19% of learners; C7 (*self-testing by translating from the native language to English whenever encountering English texts*): 21% of instructors vs. 50% of learners. These disparities indicate that instructors' teaching strategies are not always

aligned with learners' actual preferences. Conversely, learners' vocabulary learning choices do not always match instructors' expectations.

In terms of RA, the consistency in RA selections between instructors and learners was relatively low. Only three subcategories – A1 (36%-33%), A3 (57%-57%), and A5 (36%-29%) – showed similar selection percentages. However, considerable differences appeared in subcategories such as: B10 (*grouping vocabulary using images*): Chosen by 64% of instructors but only 4% of learners; B11 (*using body language to enhance vocabulary retention*): Selected by 93% of instructors, whereas only 9% of learners found this method useful. Surprisingly, while none of the instructors considered A13 (*memorizing words based on their placement in notebooks, textbooks, or the board*) as a viable method, 20% of learners preferred this technique. This suggests that instructors should consider integrating this approach into their teaching strategies.

In terms of DA, there are significant disparities in this approach. In particular, there was a stark contrast in the selection rates of DA between instructors and learners (AFS: 6.0 vs. 2.8). Only three subcategories—A7, C3, and C12—showed similar selection rates (21%-21%, 31%-36%, and 31%-36%, respectively). However, most DA subcategories revealed a substantial gap, particularly: B6 (100%-46%); B8 (57%-18%); B9 (79%-10%); C5 (64%-17%); C6 (36%-2%). An unexpected finding was in subcategory C5 (*collaborative learning through pair/group work*). While instructors frequently employed this approach in group settings, learners rarely chose it. This aligns with research by Lewis and McCook (1996), which suggests that collaborative learning is often underutilized in Asian educational settings, where grammar-based individual learning is more common. This highlights the need for instructors to create more engaging and interactive learning environments that encourage vocabulary retention through group work.

The findings demonstrate that students tend to prefer the RLA, characterized by conventional memorization strategies, while showing less inclination toward DA's experiential learning and RA's visual-based methods. This preference can be attributed to the fact that students seek the fastest way to understand new vocabulary, often neglecting long-term retention strategies that involve experiential learning. Thus, Fan (2003, p. 234) emphasized that associating foreign language vocabulary with real-life contexts significantly enhances retention. He further stated that learning through real-world applications not only aids recall but also reinforces vocabulary deeply. This suggests that instructors in the Foreign Language Faculty should introduce more practical, real-world scenarios and incorporate more visual aids such as images and models into ESP-Med instruction.

Another important observation from the study is that learners' use of audiovisual resources for learning ESP-Med vocabulary is still limited. In fact, in Basic English curriculumn, instructors have already incorporated extensive audiovisual materials, such as videos and interactive content, encouraging self-study through music, movies, posters, and online English radio channels. However, for ESP-Med, access to natural 'input' sources remains limited. This lack of exposure to diverse, authentic materials may explain why learners do not prioritize this approach. As Schmitt (1997, p. 216) stresses, effective vocabulary growth in a second language requires extensive and varied engagement with the target language in authentic contexts. Schmitt further argued that learners should enhance their vocabulary not only through "intentional learning" (structured classroom instruction) but also through "incidental learning" (unstructured, natural exposure). The availability of ESP-Med resources online, such as medical news reports from BBC and CNN, presents an unlimited, natural input source for vocabulary acquisition. Integrating these resources into ESP instruction could greatly improve learners' vocabulary retention and practical usage.

4.2 The Analysis for the Effectiveness of Three Teaching Approaches in Learning ESP-Med Vocabulary at VMMU

The analysis is based on the final exam results of Term 7 and Term 8, comparing two study groups: the experimental group (which applied three teaching approaches) and the control group (which followed traditional methods). The comparison follows three steps:

- Comparison of Term 7 scores between the experimental and control groups;
- Comparison of Term 8 scores between the experimental and control groups;
- Comparison of Term 7 and Term 8 scores within each group.

The final exam scores consist of three components: participation assessment, mid-term exams, and final course exams. participation assessment (10%) includes assignments, mini-tests (Reading and Writing), and class presentations. The mid-term exam for Term 7 is a written test, assessing 50% of the learned content in Term 7 and mirroring 70% of the final exam format. The mid-term exam for Term 8 covers content from both Term 7 and Term 8, and the final Term 8 exam is cumulative, testing knowledge from both courses. The study presents statistical data and graphical illustrations to analyze and compare the results.

4.2.1 Comparison of ESP-Med Scores – Term 7 Between the Two Groups

As can be seen from Figure 1, The experimental group demonstrated better performance, with 96% achieving Fair or higher, compared to 79% in the control group. The proportion of Good students was similar (26%-28%), but the experimental group had a significantly higher percentage of Fair students (70% vs. 50%). In contrast, the control group had a higher proportion of students in the Average-to-Weak range (20% vs. 4%). The two students who achieved Excellent grades belonged to the control group, but their small number was statistically insignificant. These results suggest that the systemic teaching approaches positively impacted students' vocabulary learning by increasing high-performing students and reducing the number of struggling learners. However, since Term 7 only assessed half of the total ESP content, the results of Term 8 provide a more comprehensive evaluation.

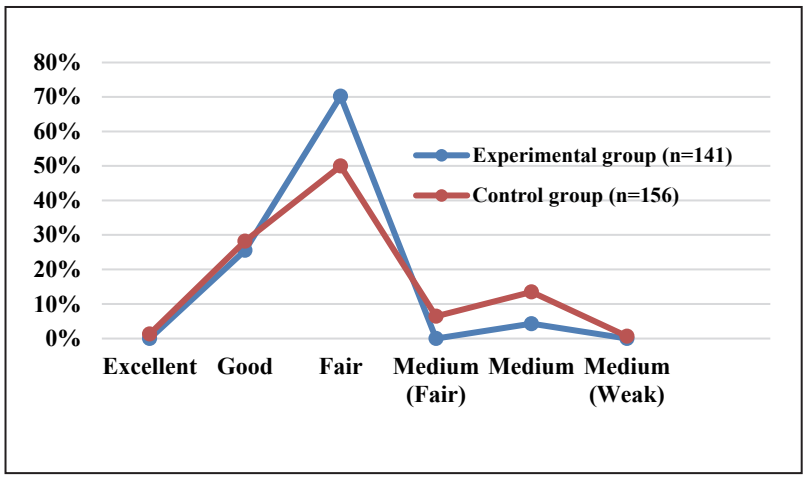

Figure 1. Comparison of ESP-Med scores of Term 7 (n=297)

4.2.1 Comparison of ESP-Med Scores – Term 8 Between the Two Groups

As can be seen from Figure 2, the experimental group demonstrated a significantly higher proportion of students achieving at the Excellent and Good levels compared to the control group, indicating a clear advantage in learning outcomes under the intervention (47% versus 27%). Furthermore, the proportion of students in the Fair category in the experimental group was only half that of the control group (7% compared to 15%), reflecting a more even and consistent performance across the cohort. Importantly, neither group recorded any students in the Medium & Weak achievement categories, suggesting that the general foundation of medical English instruction was adequately maintained. In general, despite Term 8 being cumulative (covering Term 7 content), the experimental group maintained their higher scores. This suggests that students in the experimental group were able to apply learning strategies more effectively, possibly through better self-directed learning and flexible use of different approaches.

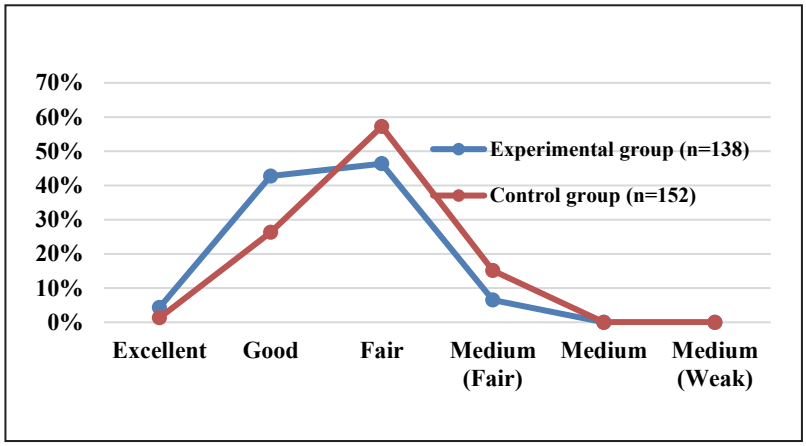

Figure 2. Comparison of ESP-Med scores of Term 8 (n=290)

4.2.3 Comparison of ESP-Med Scores – Term 7 & 8 Within Each Group

A comparison of HP7 and HP8 results in the Experimental group reveals a clear upward trend in performance. The proportion of students achieving Good and Excellent nearly doubled, rising from 26% to 47%, suggesting that the vocabulary teaching approach based on semantic theory effectively enhanced not only retention but also the application of specialized vocabulary. Although a small proportion of students reached the Fair Good level in HP8 (7%), overall performance remained strong, with no students scoring in the lower ranges. The decline in the proportion of students at the Good level—from 70% to 46%—was offset by a rise in higher achievers, indicating academic growth rather than regression. This shift reflects the success of the semantic-based model in building conceptual understanding, fostering analytical thinking, and improving competence in English for Medical Purposes. To ensure continued improvement and stability, both learners and instructors should integrate these strategies and semantic techniques into regular classroom instruction.

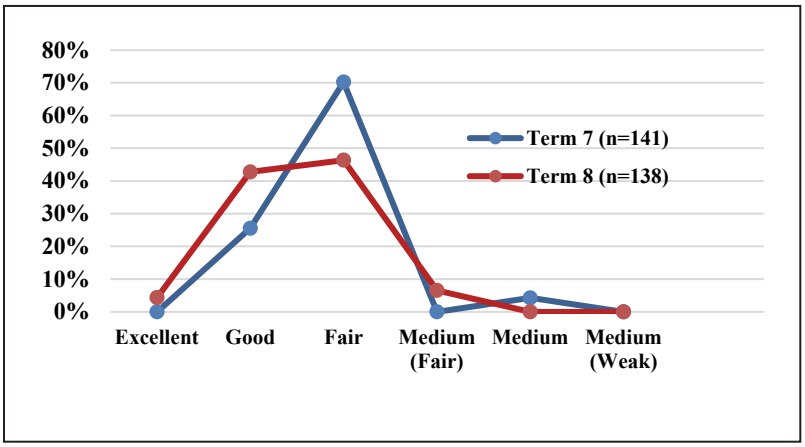

Figure 3. Comparison of ESP-Med scores of Term 7&8 in the Experiment Group

The comparison of HP7 and HP8 results in the control group reveals relative stability but lacks clear signs of improvement. While the proportion of students at the Excellent level remained unchanged, there was a slight decrease in those achieving Good, leading to an overall drop in high-achieving scores. However, the noticeable rise in the Fairly Good category suggests a shift toward greater score dispersion and possibly weaker academic progression. Although no students scored in the Medium and Weak categories, indicating a stable foundational knowledge, the control group did not show the same level of advancement as the experimental group. These findings suggest that traditional, largely passive teaching approaches may be insufficient in fostering comprehensive development and improving learners' specialized language skills. This further supports the argument for integrating more innovative instructional methods—such as the semantic-based vocabulary teaching model—into mainstream curricula to enhance the effectiveness of English for Medical Purposes instruction.

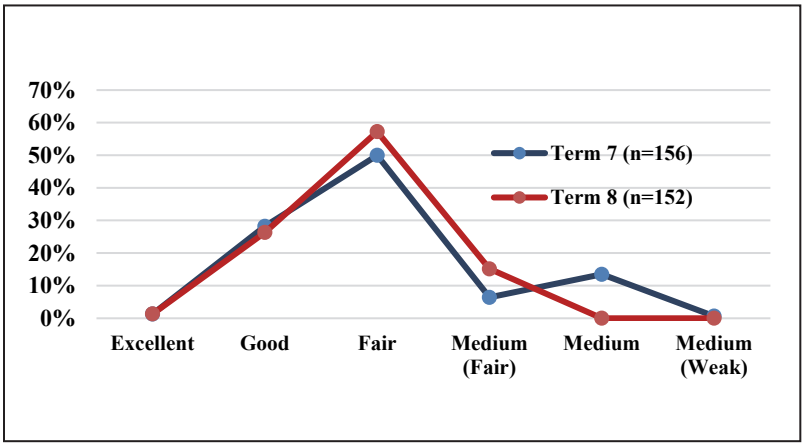

Figure 4. Comparison of ESP-Med scores of Term 7&8 in the Control Group

5. Conclusion

The study's outcomes confirm the pedagogical value of applying semantic theory to ESP-Med and propose actionable methods for refining instructional approaches in future implementations. Briefly, the study's findings can be summarized as follows:

- *Evaluation of current ESP-Med vocabulary teaching and learning methods*

Regarding the first research objective, this research yielded insightful data regarding current practices in teaching and acquiring ESP-Med vocabulary within the VMMU context. The results align with previous research while also revealing unique aspects specific to VMMU's teaching and learning environment. Here, students rely extensively on bilingual dictionaries, consistent with studies by Gu & Johnson (1996), Knight (1994), and Luppuescu & Day (1993); Limited use of monolingual dictionaries (only 19%), suggesting reliance on the mother tongue and resulting in weaker English expression skills (Jiang, 2004); Common reliance on rote memorization, such as reading aloud and repetition, which, while effective short-term, lacks long-term retention benefits (Yang, 2005; Schmitt, 1997). This study finds out that both teachers and students primarily rely on structured classroom-based teaching methods. Learners at VMMU exhibit a strong reliance on instructor-led strategies and demonstrate minimal initiative in autonomous or incidental vocabulary acquisition.

- *Evaluation of the preferences of three approaches in teaching and learning*

RLA is the most commonly used strategy by both teachers and students. DA is more frequently chosen by teachers than students. Meanwhile, RA is more preferred by students than teachers. Prominently, there are notable discrepancies between two selected groups: Large gaps in the use of specific techniques, e.g., using word cards with grouped words or images between the two groups; Vocabulary practice through sentences and group learning were unpopular among students due to individual study habits and restricted access to digital learning tools; The student inclination toward RLA suggests a tendency to prioritize immediate understanding over more durable, context-based learning techniques.

- *Evaluation of effectiveness of the three approach-based teaching model*

The second research objective focused on integrating semantic theory into ESP vocabulary instruction. In fact, the study incorporated semantic theory methodically by embedding its three key approaches into the instructional design of ESP-Med lessons. The exercises were supplementary and familiar to students, promoting self-study and independent learning strategies. The study aimed at balancing traditional and modern strategies to enhance teaching flexibility and effectiveness. As a result, the effectiveness of the three approaches in ESP-Med instruction are shown as follows: The experimental group, exposed to approach-based learning, outperformed the control group in module tests. The positive shift in the experimental group indicates that vocabulary strategies based on image referencing, semantic relations, and real-world context enhance both retention and the application of specialized language. In contrast, traditional methods in the control group showed limited impact, reinforcing the need to adopt semantic-based approaches to improve English for Medical Purposes instruction in medical education. However, limitations included the difficulty of applying incidental learning strategies and integrating authentic materials. The comparison of Term 7 and Term 8 performance data showed marginal progress, emphasizing the importance of sustained, curriculum-wide integration of semantic-based methods.

In general, this study provides a comprehensive analysis of the application of semantic theory in ESP vocabulary instruction at VMMU. It does not dismiss previous instructional methods but builds upon existing teaching traditions to introduce innovative applications for improving English language education. While the study has limitations regarding scope, timeframe, and target groups, its findings contribute to both VMMU's educational practices and broader military training institutions. Future research should continue refining and expanding the application of semantic approaches to enhance long-term ESP learning outcomes.

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References

Adakhiel, T. (2021). Teaching vocabulary using the semantic feature technique in Saudi EFL virtual classrooms; Students' attitudes and challenges. International Journal of Language and Linguistics, 6(9), 304–319. https://doi.org/10.11648/j.ijll.20210906.15

Amer. (2019). Teaching/developing vocabulary using semantic feature analysis framing the issue. In The TESOL encyclopedia of English language teaching (pp. 1–7). https://doi.org/10.1002/9781118784235.eelt0743

Ave, G. (2012). Medical terminology. http://www.DesMoines.1A50312info@dmu.edu

Božena, D. (2013). English medical terminology – Different ways of forming medical terms. JAHR, 4(7), 55–69.

Daniël, V. O., & Panos, A. (2018). Semantics. In J. Culpeper, P. Kerswill, R. Wodak, T. McEnery, & F. Katamba (Eds.), English language (2nd ed., pp. 134–145). Palgrave.

Donesch-Jezo, E. (2014). Teaching of vocabulary to medical students in ESP courses. LangLit: An International Peer-Reviewed Open Access Journal, 72–87.

Erikson, S. (2019). The effect of semantic mapping technique on technical vocabulary mastery for midwifery students. Studies in English Language and Education, 6(2), 333–342. https://doi.org/10.24815/siele.v6i2.14786

Esmail, Z., Omid, K. Z., & Hassan, B. (2017). A comparative study of teaching methods in ESP courses. European Journal of English Language Teaching, 39–49. www.oapub.org/edu

Evans, V., Dooley, J., & Tran, M. T. (2011). Career paths medical – Student's book. Express Publishing.

Fan, M. Y. (2003). Frequency of use, perceived usefulness, and actual usefulness of second language vocabulary strategies: A study of Hong Kong learners. The Modern Language Journal, 87(2), 222–241. https://doi.org/10.1111/1540-4781.00187

Gamal, M. A. A. (2013). Strategies and approaches for teaching and learning of medical terminology. International Journal of English and Education, 2(2), 225–240.

Gu, Y., & Johnson, R. K. (1996). Vocabulary learning strategies and language learning outcomes. Language Learning, 46(4), 643–679. https://doi.org/10.1111/j.1467-1770.1996.tb01355.x

Graham, L. (1995). Functional English grammar: An introduction for second language teachers. Cambridge University Press.

Halliday, M. A. K., & Matthiessen, C. M. I. M. (2004). An introduction to functional grammar (3rd ed.). Edward Arnold. https://doi.org/10.4324/9780203783771

Hurford, J. R., & Heasley, B. (2007). Semantics: A coursebook. Cambridge University Press.

Jasmina, R., & Ivana, C. (2018). Vocabulary learning strategies used by medical students: Croatian perspective. Journal of Arts & Humanities, 7(2), 44–88. https://doi.org/10.18533/journal.v7i2.1338

Jiang, N. (2004). Semantic transfer and development in adult L2 vocabulary acquisition. The Modern Language Journal, 88(3), 416–432. https://doi.org/10.1075/lllt.10.09jia

Jonassen, D. H. (1993). Structural knowledge: Techniques for representing, conveying, and acquiring structural knowledge. Lawrence Erlbaum Associates. https://doi.org/10.4324/9780203052563

Khan, N. (2016). Difficulty in mastering and using English for specific purpose (medical). International Journal of Education, 8(1), 78–92. https://doi.org/10.5296/ije.v8i1.9163

Knight, S. (1994). Dictionary use while reading: The effects on comprehension and vocabulary acquisition for students of different verbal abilities. The Modern Language Journal, 78(3), 285–299. https://doi.org/10.1111/j.1540-4781.1994.tb02043.x

Lewis, M., & McCook, F. (1996). Cultures of teaching: Voices from Vietnam. ELT Journal, 56(2), 146–153. https://doi.org/10.1093/elt/56.2.146

Lyons, J. (1995). An introduction to semantics. Cambridge University Press.

Luppuescu, S., & Day, R. R. (1993). Reading, dictionaries, and vocabulary learning. Language Learning, 43(2), 263–287. https://doi.org/10.1111/j.1467-1770.1992.tb00717.x

Oxford, R. L. (2001). Language learning strategies. In R. Carter & D. Nunan (Eds.), The Cambridge guide to teaching English to speakers of other languages (pp. 166–172). Cambridge University Press.

Oxford, R., & Nyikos, M. (1989). Variables affecting choice of language learning strategies by university students. The Modern Language Journal, 73(3), 291–300. https://doi.org/10.1111/j.1540-4781.1989.tb06367.x

Saragih, E. (2019). The effect of semantic mapping technique on technical vocabulary mastery for midwifery students. Studies in English Language and Education, 6(2), 333–342. https://doi.org/10.24815/siele.v6i2.14786

Schmitt, N. (1997). Vocabulary learning strategies. In N. Schmitt & P. McCarthy (Eds.), Vocabulary: Description, acquisition and pedagogy (pp. 236–239). Cambridge University Press.

Trier, J. (1931). Theory of semantic fields. Clarendon Press.

Wang, Z. (2023). The application of semantic field theory in vocabulary learning. Frontiers in Humanities and Social Sciences, 3(3), 29–40. https://doi.org/10.54691/fhss.v3i3.4461

Wilkins, D. A. (1972). Linguistics in language teaching. Edward Arnold. https://doi.org/10.1017/S0025100300000682

Yang, Z. (2005). Terminology-centred English for medical purpose teaching. Sino-US English Teaching, 2, 20–22.

Yesim, D., & Nurcihan, Y. (2013). Using semantic mapping technique in vocabulary teaching at pre-intermediate level. Procedia - Social and Behavioral Sciences, 70, 1531–1544. https://doi.org/10.1016/j.sbspro.2013.01.221

Yulianti, K. (2007). The new curriculum implementation in Indonesia: A study in two primary schools. International Journal about Parents in Education, 9(1), 157–168. https://doi.org/10.54195/ijpe.18243

Zahra, H., & Maryam, H. (2014). Investigation of vocabulary learning strategies among EFL Iranian medical sciences students. Procedia - Social and Behavioral Sciences, 192, 629–637. https://doi.org/10.1016/j.sbspro.2015.06.110

Lê, H. B. C., & Lâm, T. T. T. (2020). Reality and needs for learning and using medical English of 3rd and 6th year medical students at Can Tho University of Medicine and Pharmacy. Can Tho Journal of Medicine and Pharmacy, 27, 85–92.

Nguyễn, H. H., Phan, H. T., & Nguyễn, V. C. (2015). Surveying the learning needs of students at Nurse Anesthetist Department. Ho Chi Minh Medicine and Pharmacy University, 19(5), 266–229.

Nguyễn, T. N. (2012). Luận bàn về việc ứng dụng phương thức sử dụng hình thái học, âm vị học và ngữ âm học trong việc giảng dạy thuật ngữ tiếng Anh chuyên ngành y. Tạp chí Y học thực hành, 6(825), 96–98.

Nguyễn, T. N. (2014a). Vai trò của phân tích diễn ngôn trong giảng dạy thuật ngữ và kỹ năng đọc ngôn ngữ của ngành y. Tạp chí Giáo dục, 6, 151–153.

Nguyễn, T. N. (2014b). Tìm hiểu về phân tích hội thoại một cách tiếp cận trong phân tích diễn ngôn. Tạp chí Giáo dục, 6, 151–153.