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# Vocabulary Learning and Memory Strategies Usage among English for Medical Purposes (EMP) Students

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**Abstract.** In the backdrop of globalization, proficient command of English as an international language is essential in different research fields. English for Medical Purposes (EMP) is an essential prerequisite for international communication and exchanges, however, vocabulary has been found to be an obstacle in EMP learning, which affects learners' academic achievement in their professional field. This article investigated students' beliefs on EMP vocabulary learning, preferences for memory strategies, and perceptions on memory strategies usage. It aimed to find out the difficulty in EMP vocabulary learning, viable memory strategies and the effect and influence of using these strategies. A qualitative research method of in-depth interview was used to deeply explore students' real subjective thinking on EMP vocabulary learning and memory strategies usage. Students from Ningxia Medical University, China, who would like to improve their EMP lexical proficiency were conveniently selected as the participants. The qualitative analysis software NVivo 12 was used to analyze the collected data. The results mainly indicate that most students believe EMP lexis is challenging to learn because of its complicated characteristics, while high language proficiency learners are found to utilize more memory strategies. Students primarily concentrate on simple operations of strategies use and agree on the benefits of enhancing memorization, while having own categorization of learning EMP lexical items. The conclusions obtained from the research results could provide references for both EMP vocabulary teaching and learning, and some recommendations are proposed to improve EMP vocabulary learning quality.

**Keywords:** English for Medical Purposes; memory strategies; vocabulary; Chinese students

## 1. Introduction

With the acceleration of globalization, the English language has become more significant in professional communication. It is commonly recognized as the international language of science and has been widely used in evidence-based

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medicine research (Williams et al., 2024). With the development of medical technology, proficient use of English for Medical Purposes (EMP) skill has become an essential prerequisite for medical personnel (Liu & Tan, 2021) since English as an international language has an important role in guiding all fields of science (Nurhidayat & Fatmawati, 2021) and is also the lingua franca of medical international communication (Saydullayevna & Furkatovna, 2020). EMP, as a specific genre of English, is a cross-disciplinary professional introductory course in applied linguistics and medicine (Wang et al., 2021), playing a vital role for medical students to understand the frontier dynamics of medicine, to write academic papers, and for clinical work exchanges.

In EMP learning, vocabulary is vital and integral. Lexis plays a vital role in cultivating students' language ability and skills (Warni & Jufri, 2023). In the process of EMP teaching, vocabulary is found to be an extremely critical factor which directly affects the output of EMP learning and also determines students' academic English ability to retrieve English literature, grasp international medical dynamics, and exchange ideas in related international medical fields (Wang et al., 2021). Unfortunately, lack of vocabulary knowledge may lead to stress and anxiety, making learners lose motivation and encouragement in language learning (M Al Zahrani & Chaudhary, 2022). Notably, 77.1% of students think thesis writing requires EMP vocabulary (Wang et al., 2018) since students will encounter problems in written activities without adequate vocabulary (Warni & Jufri, 2023). Therefore, vocabulary is the basis of EMP and also an essential element for medical students to conduct wide international exchanges, playing a fundamental role in listening, speaking, reading and writing (Liu & Tan, 2021).

However, the professionalism and complexity of medical disciplines lead to lack of EMP lexical competence, owing to its huge volume, and complicated, complex structure which makes it difficult to remember (Le & Miller, 2023; Wang & Zhang, 2021). Hence, the students encounter more difficulties reading English literature if they do not efficiently master enough EMP lexical words (Jin et al., 2021). However, many studies have shown that EMP vocabulary memorization can be improved by using certain memory strategies (Gao & Zhang, 2022). It is found that memory strategy usage significantly improves students' English language proficiency, and learners' understanding of EMP literature is enhanced by using strategies to master professional lexis (Lei & Wu, 2019). Therefore, it can be seen that memory strategies significantly help students acquire a good volume of EMP vocabulary

Therefore, in order to understand EMP lexical learning, memory strategies usage awareness, and the specific contexts of strategies usage, several research questions were designed to obtain answers for the following:

1. What are students' beliefs on EMP lexical learning?

2. What are students' preferences on memory strategies usage in EMP lexical learning?

3. What are students' perceptions on memory strategies usage in EMP lexical learning?

By deeply investigating students' opinions of EMP vocabulary learning and their perceptions on memory strategies usage, this study is hoped to assist students in understanding their extent of EMP vocabulary learning and strategies usage, encourage English language instructors to utilize flexible EMP vocabulary teaching methods and provide relevant reference for researchers.

## 2. Literature Review

Nation (2001) points out that vocabulary facilitates learners to understand the knowledge of using the language. Vocabulary is of great importance in EMP learning (Le & Miller, 2023). Studies have shown that EMP lexical learning is a major difficulty encountered (Jin et al., 2021; Wang et al., 2021), and insufficient vocabulary will have a negative impact on learners' language performance (Bashori et al., 2021). Although students often have good medical knowledge, they still face considerable challenges in corresponding English terms (Bai, 2022). It is known that most EMP vocabulary items are words composed of affixes and roots from ancient Greek and Latin, with characteristics of obscure, abstract, and difficult items to learn (Zheng & You, 2021). It has also been found that 70.6% of students believe EMP vocabulary is too challenging to learn (Bai, 2022). As a result, the poor learning effect of EMP has rendered many students unable to utilize English language proficiently after graduation, which ultimately cannot meet the requirements for talents in the society (Ke, 2022).

Memory strategies belong to the category of learning strategies (Fan, 2018). Vocabulary learning strategies have been proven to have a significant positive impact on learners' vocabulary knowledge size (Al-Khawaldeh et al., 2023). Oxford's (1990) language learning strategies theory systematically and comprehensively elaborates this. The depth of processing approach proposed by Craik and Lockhart (1990) and the classifications from experts of Lv (2003), Ma (1997), and Schmidt (2001) also provide firm theoretical bases for classifying and comparing memory strategies. According to theoretical literature, memory strategies can be classified as shallow and deep encoding memory strategies (Hong, 2007; Jiang, 2020). The strategies of spelling, keyword, chunking, repetition and use of word lists, which focus on word form and sound, are classified as shallow encoding memory strategies. Meanwhile, strategies with semantic features belong to deep encoding memory strategies, which include use of word-structure, contextual, activation, association and metacognitive regulation strategies (Hong, 2007; Jiang, 2020). In this study, memory strategies involve both shallow and deep encoding strategies.

It is found that memory strategies act positively in vocabulary learning, so it is easier for learners to commit new words to memorization by using strategies (Al-Qaysi & Shabdin, 2016). Many studies have shown that memory strategies are beneficial for vocabulary learning and evidently propel learners to improve their language learning ability (Pu, 2020). For example, chunking strategy can improve learners' medical words learning efficiency effectively; a study by Tian and Jiang (2020) using a questionnaire showed that chunking strategy is the most commonly

used professional method, which is recognized and accepted by most learners in "organ system-based" EMP vocabulary learning. Association strategy is also found to be very important, and most students believe that it enables them to remember words easily (Yang, 2021).

Therefore, it can be seen that although EMP vocabulary is complex, lengthy and contains obscure characteristics of medical terminology, which leads to the difficulty in understanding and memorizing EMP vocabulary, learners can improve language proficiency by using certain memory strategies comprehensively. However, the literature shows that previous studies primarily concluded that EMP vocabulary is complex to remember, yet, there are limited studies exploring the reasons. Although studies have proven that memory strategies are beneficial for lexical learning, there is a dearth of studies on the effects and influences of using memory strategies in EMP vocabulary learning.

## 3. Methodology

This study mainly applied a qualitative research method of in-depth interview to gain insight into medical students' knowledge of EMP vocabulary learning and their views on memory strategies usage. The qualitative analysis software of NVivo 12 was utilized to analyze the data.

An in-depth interview was conducted to qualitatively understand students' beliefs on EMP vocabulary learning and strategies usage and to elicit the specific memory strategies used by students. Interviewing is considered a suitable strategy (Seidman, 2013) if researchers wish to understand research participants' cognitive processes. Therefore, in-depth interview is mainly utilized to obtain exploratory research data on deep analysis of problems (Gou, 2020) and to understand individual' experiences (Seidman, 2013).

Creswell (2015) suggests that it is appropriate to have between four to six participants for interview. In this study, a total of six participants were selected based on their language proficiency, as well as teachers' observations within the scope of class activity engagement, participation, assignment completion and academic achievement. The researchers studied each participant's comprehensive attributes with their English teachers. Consequently, six participants who demonstrated excellent class activity engagement, participation, and task completion were determined. Students with semester academic scores above 90 (100 mark system) were classified as high language proficiency learners (female participant A and male participant B), those who scored between 70 to 80 marks were categorized as average language proficiency (female participant C and male participant D) and those below 60 were respectively ranked as low language proficiency learners (male participant E and female participant F) (Song et al., 2015).

An interview protocol was first developed to guide the interview process (Jacob & Furgerson, 2012) and interview protocol refinement framework (Castillo-Montoya, 2016). A pilot interview was conducted to assess the duration and clarity of interview items. Finally, the in-depth interview questions were confirmed: a) Do you think EMP vocabulary is difficult to learn? Why/Why not?

b) Do you think it is necessary to use memory strategies to learn EMP vocabulary? Why/Why not?? c) Do you like to use memory strategies when learning vocabulary? Why/Why not? d) Which memory strategy do you like best? e) Do you believe teachers need to teach memory strategies in the future? Why/Why not?

Subsequently, a quiet psychology counselling room was chosen to conduct the interview. Recording equipment was utilized to record the whole interview process, and the researchers also took brief notes to ensure the interview materials were clear. The audiotapes of interviewee responses were transcribed into text materials, which were then encoded, based on the coding protocol by Corbin and Strauss (2015). The respective materials were collected and encoded in NVivo 12. The specific interview text about the students' beliefs and perceptions on EMP vocabulary learning and memory strategies usage were analysed and encoded by applying the free-coding method to determine the codes.

## 4. Results and Discussion

### 4.1 Presentation of Interview Content

The interview text was encoded using NVivo 12, which intuitively presented the distribution of each node and improved the qualitative analysis data. The researchers analysed and categorized text information and combined the learning experience of the participants to find out the logical relationship between each node. The students' beliefs on EMP vocabulary learning, their preferences on strategy usage, the reasons for applying strategies, the effect and influence of using strategies, and their expectations from the instructors are presented visually in Figure 1.

节点

搜索 项目

| Name | Sources | References | Created on | Created |
|---|---|---|---|---|
| Beliefs | 1 | 1 | 2023/1/15 9:20 | CUI |
| It's difficult to learn EMP vocabulary | 1 | 10 | 2023/1/15 9:24 | CUI |
| It's not difficult to learn EMP vocabulary | 1 | 2 | 2023/1/15 9:24 | CUI |
| Effect & influence | 1 | 1 | 2023/1/15 11:18 | CUI |
| The first category | 1 | 8 | 2023/1/15 11:21 | CUI |
| The second category | 1 | 3 | 2023/1/15 11:21 | CUI |
| Expectation | 1 | 1 | 2023/1/15 11:26 | CUI |
| They believe teachers need to teach more memory strategies | 1 | 5 | 2023/1/15 11:26 | CUI |
| They do not care teaching or not teaching memory strategies | 1 | 1 | 2023/1/15 11:26 | CUI |
| Preference | 1 | 1 | 2023/1/15 9:21 | CUI |
| They do not like to use strategies | 1 | 1 | 2023/1/15 9:27 | CUI |
| They like to use strategies | 1 | 5 | 2023/1/15 9:27 | CUI |
| Association strategy | 1 | 1 | 2023/1/15 9:28 | CUI |
| Repetition strategy | 1 | 6 | 2023/1/15 9:28 | CUI |
| Spelling strategy | 1 | 3 | 2023/1/15 9:28 | CUI |
| Use of word-structure strategy | 1 | 3 | 2023/1/15 9:28 | CUI |
| Reasons | 1 | 1 | 2023/1/15 9:22 | CUI |
| It enhances memorization | 1 | 4 | 2023/1/15 9:39 | CUI |
| It helps to categorically memorize words | 1 | 2 | 2023/1/15 9:39 | CUI |
| It is easy to conduct the strategies | 1 | 3 | 2023/1/15 9:39 | CUI |

**Figure 1: Frequency of coding in NVivo**

The word cloud was drawn to display the word frequency of the interview intuitively and visually. Figure 2 shows the word cloud of six participants' views on EMP vocabulary learning and memory strategies usage in all nodes being encoded. This word cloud selected the 100 words that appeared most frequently in the interview text. The size of the vocabulary represents the frequency of occurrence, and the larger the vocabulary is, the higher the frequency is. Conversely, the smaller size of the word is, the lower the frequency of occurrence is.

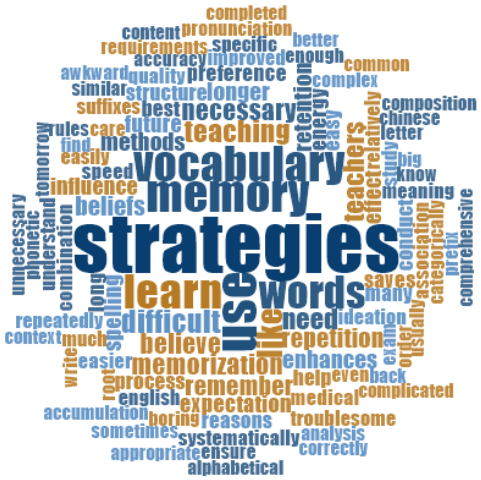


**Figure 2: Word cloud of the interview text**

To accurately reflect the exact value of frequency of each word, the top 30 most frequently used words are listed in Table 1. The words mainly include related items such as beliefs on EMP vocabulary learning, words about preference for strategies, vocabulary about the effect and influence of strategies, and items about expectations from teachers. These high-frequency words directly reflect students' opinions about EMP vocabulary learning and their perceptions on memory strategies usage.

**Table 1: High-frequency word list of the interview content**

| Words | Count | Weighted Percentage (%) |
|---|---|---|
| strategies | 107 | 2.79 |
| use | 65 | 1.69 |
| memory | 55 | 1.43 |
| vocabulary | 51 | 1.33 |
| learn | 50 | 1.30 |
| words | 44 | 1.15 |
| like | 27 | 0.70 |
| difficult | 23 | 0.60 |
| teaching | 20 | 0.52 |
| need | 17 | 0.44 |
| teachers | 17 | 0.44 |
| believe | 16 | 0.42 |
| memorization | 16 | 0.42 |
| necessary | 16 | 0.42 |
| remember | 13 | 0.34 |
| repetition | 13 | 0.34 |

| | | |
|---|---|---|
| beliefs | 12 | 0.31 |
| enhances | 10 | 0.26 |
| longer | 10 | 0.26 |
| methods | 10 | 0.26 |
| retention | 10 | 0.26 |
| expectation | 9 | 0.23 |
| future | 9 | 0.23 |
| spelling | 9 | 0.23 |
| effect | 8 | 0.21 |
| influence | 8 | 0.21 |
| saves | 7 | 0.18 |
| energy | 7 | 0.18 |
| long | 7 | 0.18 |
| preference | 7 | 0.18 |

The researchers read the interview text carefully, aggregated valid information, and encoded the text using the three-level method in the NVivo system. The more times the content was encoded, the more references were formed, from which the main codes and sub-codes were formed. Lastly, a total of five main nodes, 11 sub-codes and 57 references were established (see Figure 1). In the process of first-level coding, the original interview text was encoded (for example, the sentence "Medical English vocabulary is usually very long and complex. I find it's not easy for me to learn these words" was incorporated into the sub-node of "It's difficult to learn EMP vocabulary") and this process is called open-coding. In the second-level coding, the points similar to the first-level references were classified into sub-codes (for instance, the sub-codes "It's difficult to learn EMP vocabulary" and "It's not difficult to learn EMP vocabulary" were attained), and such process was named as spindle-type coding. Lastly, a total of five spindle-type codes (beliefs, preferences, reasons, effect and influence, and expectation) were established as the main codes. Finally, a code of beliefs on EMP lexical learning and memory strategies usage was selected, and each code could be linked based on the five main codes.

**4.2 Students' Beliefs on EMP Vocabulary Learning**

In this study, the participants' opinions on whether EMP vocabulary is difficult to learn and whether it is necessary to utilize memory strategies in EMP lexical learning are summarized as their beliefs about vocabulary learning. All participants' opinions on vocabulary learning and strategies usage were encoded accordingly. In analyzing students' beliefs on EMP vocabulary learning, the references most encoded were that "It's difficult to learn EMP vocabulary". It is also necessary to tap on strategies in vocabulary learning. The specific nodes and references can be seen in Table 2.

**Table 2: The nodes and references of beliefs**

| The first level node | The second level node | References | Examples |
|---|---|---|---|
| Beliefs | It's difficult to learn EMP vocabulary | 10 | I think it's difficult to learn EMP vocabulary owing to the relatively jerky characteristics of vocabulary itself. Therefore, I think learners need to apply some strategies in vocabulary learning. |
| | It's not difficult to learn EMP vocabulary | 2 | I find EMP vocabulary is not difficult to learn if I immerse much more in remembering affixes, because most words have same or similar prefixes and suffixes. |

As for EMP vocabulary learning, most participants thought it was difficult to learn vocabulary. "I think it's difficult to learn EMP vocabulary owing to the relatively jerky characteristics of vocabulary themselves. The words are always long and complicated", Participant A (a high language proficiency learner) related. Likewise, Participant B, a high language proficiency learner, believed it was so difficult to remember EMP vocabulary because he did not utilize those words often, but usually used them in English class. Participant D, who is of average language learner, also said "I am not very interested in learning EMP vocabulary, the words are commonly boring to memorize, so, it isn't easy to learn them." Similarly, Participant F (a low language proficiency learner) stated:

4. I think EMP vocabulary is too hard to learn. That is because most of the EMP lexical items are different with the general English words we usually use in daily learning. Moreover, the alphabetical order of EMP lexis is also random, making them more difficult to remember.

5. Therefore, it can be drawn that EMP vocabulary is challenging to learn in most participants' minds. This result matched the research results from Zaidi and Jadaan (2022), who carried out a questionnaire survey on undergraduate and postgraduate students of Medical, Dental, Pharmacy and Nursing Colleges from a university in the UAE to investigate their problems in learning EMP vocabulary. The results revealed that the majority of students found it difficult to understand and learn EMP vocabulary because students with non-English medium backgrounds usually had weak linguistic skills. Thereby, English language learners believe lexical items are too difficult to remember. Conversely, only Participant C (an average language proficiency learner) said, "I find EMP vocabulary is not difficult to learn if I spend more time and energy on remembering affixes because most words have the same or similar prefixes and suffixes." It indicates that it is not difficult to learn vocabulary once students master certain memory strategies. This is consistent with Kang's (2021) research result, which is that language learners improve their vocabulary learning proficiency by mastering the words with same or similar affixes.

With respect to memory strategies usage, the participants believed it was necessary to utilize memory strategies to learn EMP vocabulary. Participants A, B and C upheld the importance of using strategies in vocabulary learning. Participant D particularly emphasized the necessity of memory strategies

usage: "Using strategies can significantly improve my efficiency of vocabulary learning. Thereby, I think learners need to apply some strategies in vocabulary learning." Participant C (an average language learner) had different idea on strategies usage: "I don't usually use memory strategies although I know it is necessary …" In comparison, Participant F held a different idea: "In my opinion, strategies usage is meaningless because I think it is unnecessary to utilize strategies in vocabulary learning at all."

It is acknowledged that most participants believed it was very necessary to tap on strategies in learning EMP vocabulary, as similarly found by Yang (2021). However, one participant expressed it was unnecessary to utilize strategies in EMP lexical learning, so she rarely used memory strategies. Data analysis indicated that this participant was a low language proficiency learner who was reluctant to learn English.

Evidently, students believed that EMP lexis was challenging to remember. Thereby, they contended that utilizing memory strategies was vital in EMP vocabulary learning. In short, the results do not corroborate with findings of other studies. As for participants' beliefs on EMP vocabulary learning and the necessity of using memory strategies, previous studies have primarily combined the characteristics of EMP terminology and relatively concluded that EMP vocabulary was complicated to learn. However, a dearth of studies have examined whether students find EMP terms challenging to learn and why. As such, this study deeply explored participants' views on learning EMP lexis and their opinions on memory strategies usage. Hence, the results obtained are more comprehensive and objective, enriching the research context of EMP vocabulary.

### 4.3 Students' Preferences for Strategies Usage

Different learners have different preferences for strategies usage, so the researchers interviewed the participants and obtained their views on using strategies and preferred memory strategies to find out the differences in strategies usage in the coding process (Table 3).

**Table 3: The nodes and references of strategy preference**

| The first-level node | The second-level node | References | Examples |
|---|---|---|---|
| Preference | They like to use strategies (Spelling strategy, Repetition strategy, Association strategy, Use of word-structure strategy) | 10 | I like to use strategies, for example, I usually use spelling strategy because I am familiar of the phonetic combinations which can help me to ensure accuracy of the words. |
| | They do not like to use strategies | 2 | I usually do not use memory strategies deliberately. I think it is better to learn words directly than spending time on remembering the methods. |

Most participants said they liked to tap on memory strategies. Only Participant F revealed, I usually do not use memory strategies deliberately. I think it is better to learn words directly than spend time remembering the methods." It was also found that different participants preferred using different types of strategies, but all preferred repetition strategy. Spelling strategy was one of the most preferred strategies too (Participant A, B and D), as well as the use of word-structure strategy (Participant A, B and C). Additionally, Participant A had preference for association strategy, too. However, Participant E only liked to utilize repetition strategy. Similarly, Participant F said, "If I have to say one method of learning vocabulary, I choose repetition strategy. I do not like to use memory strategies because I feel using strategies is also cumbersome, and it seems not to play a big role."

Therefore, the participants' favoured memory strategies were mainly spelling and repetition strategies, followed by use of word-structure and association strategies. Similarly, spelling, repetition and use of word-structure strategies were also reported to be medical students most frequently used strategies (Cui & Kaur, 2023). Likewise, Jiang's (2020) results showed that in the course of using memory strategies, the most frequently utilized strategies were repetition, spelling, and association strategies. This is consistent with the findings of this study, except for the use of word-structure strategy.

In this study, spelling strategy was found to be one of the most preferred memory strategies utilized by learners. Most participants liked to use spelling strategy because they have been learning phonetic symbols since they began learning English. They can read and learn words, and remember new words according to pronunciation, and also use phonetic combinations to ensure accuracy. In contrast, some studies have found that spelling strategy does not significantly improve learners' vocabulary levels (Kang, 2021). This is because many students usually resort to spelling out letters of a word orally, like remembering a phone number, so the memorization effect is low.

Moreover, this study also found that students generally like to utilize repetition strategy. It is similar to the results by Cui and Kaur (2023) where repetition strategy was found to be one of the most frequently used strategies. Besides, a psychologist test has proven that to remember a word for a lifetime, it must be repeated at least 100 to 150 times, with intervals and pauses in between (Hong, 2007). Therefore, taking the appropriate repetition method and grasping appropriate repetition timing are beneficial to word memorization.

In addition, use of word-structure strategy was also one of the preferred strategies among students. It was found that use of word-structure strategy was able to improve memorization efficiency, deepen memorization effect, and expand vocabulary size (Jin et al., 2020). In this study, students' preference for applying use of word-structure strategy in learning words is closely related to EMP vocabulary. EMP vocabulary is basically composed of roots, prefixes, suffixes and combining vowels according to specific rules (Jin et al., 2020), so use of word-structure strategy is more systematic and comprehensive, which can assist

learners in learning multiple similar vocabulary items simultaneously.

Furthermore, association strategy was also found to be one the favourite strategies. Association strategies enables students to make associations with previously learned words when learning new vocabulary, thereby promoting ability to remember lexis. That is to say, association strategy does not not only assist students in remembering the meaning of new words, but is also helpful in reviewing previously mastered words and inferring unfamiliar words through context when doing reading comprehension (Li, 2019). Therefore, association strategy is preferred by the majority of students.

Briefly, it can be concluded that high language proficiency learners like to utilize more memory strategies. Average language proficiency learners tend to use strategies to a lesser extent than high language proficiency learners, while low language proficiency learners only tap on single memory strategy. Besides, it is clear that shallow encoding strategies such as spelling and repetition strategies, which are easier conducted, are highly preferred and used by all language proficiency learners. However, as for students' favourite memory strategies is concerned, only four strategies were mentioned, indicating that students relatively lacked adequate understanding of memory strategies usage and had limited knowledge of memory strategies too. Similar results were found in Guan's (2018) study, in which students had less knowledge of memory strategies, and they did not know which strategy to utilize in vocabulary learning. Another study also reported teachers' insights into students' lack of interest in learning lexis, let alone using effective strategies in achieving this end (Yang, 2021).

### 4.4 Students' Perceptions on Memory Strategies Usage

In this study, students' perceptions on memory strategies usage in EMP lexical learning were elaborated by analyzing three codes, which were reasons for using memory strategies, effect and influence of using strategies, and expectations from instructors (Table 4).

**Table 4: The nodes and references of reasons, effect and influence, and expectation**

| The first level node | The second level node | References | Examples |
|---|---|---|---|
| Reasons | It is easy to conduct the strategies | 3 | I only need to repeatedly read and write the words, so it is easy for me to use repetition strategy. |
| | It enhances memorization | 4 | I find my memorization is enhanced by using association strategy. |
| | It helps to categorically memorize words | 2 | Some words can be learned by categorizing the similar parts. |
| Effect & influence | The first category | 8 | My learning speed and the number of learned words are all improved by using some methods. |
| | The second category | 3 | I don't have much energy and time to specifically choose which strategy to use. |
| Expectation | They believe teachers need to | 5 | I do hope to learn more knowledge about strategies from teachers, because I find |

| | | |
|---|---|---|
| teach more memory strategies | | strategies can greatly help to improve vocabulary learning efficiency. |
| They do not care about whether memory strategies are taught or not | 1 | Teaching or not teaching memory strategies doesn't matter much for me, because I rarely use memory strategies. |

With regard to the question as to whether the participants liked to utilize memory strategies, all the participants (N=6) offered a variety of reasons, Participant A said, "I usually associate some pictures and scenes to deepen my impression of the words, which always makes my memorization fresh." Participant B and D believed using strategies in learning vocabulary enhanced their memorization and would have a better effect than only rote remembering of words. Participant C and E stated using memory strategies helped them in learning multiple similar vocabulary items at the same time by categorizing the same attributes. In addition, most participants believed it was very easy and convenient to use spelling and repetition strategies in vocabulary learning (Participants A, B, C, D and E).

As is known, learners adopt learning strategies to make learning more effective and lasting (Mitchell & Myles, 2002). Therefore, the reasons why participants like to utilize memory strategies may be attributed to several factors. The first is that memory strategies are easy to operate, such as repetition and spelling strategies. For example, learners only need to repeat reading or writing the target words using repetition strategy (Jiang, 2020). The second is that memory strategies usage is able to enhance memorization. Oxford and Nyikos (1989) pointed out that memory strategies assist learners in storing knowledge. In this study, some high English language proficiency learners (for example, Participant A) preferred to use association strategy because it made them think more about new words with known words, enhancing memorization of both new and known words (Chen, 2020). The third attribute is that it helps learners to categorically memorize lexical items. According to the characteristics of EMP vocabulary, there are many prefixes, roots and suffixes. Once learners know a certain category of the affixes, they are able to guess the meaning of the series of words and learn how to classify words of the same attribute, hence, further improve learning effectiveness (Guan, 2018).

As for effect and influence of using strategies, a significant percentage of students shared that using memory strategies had different effects and influences on their EMP lexical learning. Participant A expressed, "My learning speed and the number of words I have learned are all improved by using some methods." Participant B believed it would save time and energy by using some strategies in learning complicated English vocabulary. Participant D said, "I find I can learn words more easily and remember the words for a long period by using some strategies." Participant E stated that vocabulary retention would occur for extended period if the memory strategy is suitable. Participant C had a slightly different view on using strategies: "I know it is good to use some strategies in vocabulary learning, but I don't have much energy and time to specifically choose which strategy to use because I need to spend much time on many courses." In contrast, Participant F expressed a completely different opinion:

6. I do not use memory strategies deliberately. I feel I can't remember those complicated words no matter what. I also learned knowledge about those methods, but they're too complicated, and I need to spend much time studying how to use them. For example, there are so many roots and affixes, but remembering these affixes and roots is difficult and also takes time, and I'd rather to spend the time on learning words.

Therefore, different insights were obtained into the effect and influence of memory strategies usage. These can be classified as two categories - the first category includes a) helping to improve vocabulary learning speed and expand vocabulary size, b) saving time and energy in learning complicated English lexis, c) learning English words more easily, and d) keeping vocabulary retention longer. These effects and influences have also been proven in many previous studies (Al-Khawaldeh et al., 2023; Yang, 2021).

The second category covers three aspects. The first is that the process of constructing a strategy istroublesome, therefore, some learners dislike using it. The second is although learners know it is necessary to utilize strategies to learn EMP vocabulary, they do not have much perseverance and time to specifically study which strategy to use owing to heavy coursework and academic tasks. This has been proven in Faure's (2016) and Li's (2018) study where medical students devoted very little time to medical English learning due to considerable volume of medical knowledge they have to acquire and memorise. The third is that learners do not systematically learned how to utilize strategies, so they lack comprehensive knowledge of memory strategies.

With respect to expectations from instructors, many participants (A, B, D, E) believed teachers need to provide more knowledge about memory strategies. They hope to learn more strategies from teachers so that they would be able to learn lexis easily and efficiently and also improve their English language scores. However, Participant C stated: "For me, I don't have a big desire to learn memory strategies because I am accustomed to my usual method. Even teachers have taught some learning methods before; I rarely use them." Similarly, Participant F said, "Teaching or not teaching memory strategies does not matter much for me because I rarely use memory strategies."

It can be seen that most participants believe teachers need to teach more strategies because strategies are able to assist students in learning vocabulary efficiently and easily. Students expect teachers to provide more knowledge about learning strategies. However, there were also some participants who explicitly expressed lack of expectation to learn any memory strategies and that they would rather tap on their usual method. Hence, some participants were indifferent to the need for teaching strategies because they rarely utilized strategies.

As such, we can see that different language proficiency learners have different perceptions on memory strategies usage. It is acknowledged that these data were taken from a small sample of six participants. Hence, the results cannot be generalized to the general population. However, although many studies have shown the positive link between strategies use and EFL vocabulary learning, there

is limited research on the effects and influence of using memory strategies in EMP lexical learning. This study particularly interviewed participants on their opinions of the effect and influence of using strategies. The encouraging and reliable data genuinely reflected their attitudes on strategies use and the effect and influence of using strategies they have experienced, deepening the research depth of memory strategies in EMP lexical learning. Consequently, this in-depth interview integrated qualitative research methods with previous studies and provides reliable references for future teachers' EMP terminology teaching.

## 5. Conclusions

The qualitative method is an effective means to explore an individual's views on something. This study employed an in-depth interview to explore EMP participants' beliefs, preferences, and perceptions regarding memory strategy usage and vocabulary learning. The qualitative data revealed that most students (including high, average and low language proficiency learners) hold the view that EMP lexis is challenging to learn because of its complicated characteristic (complex, incomprehensible, long, and less frequently used in daily life). Thus, most participants believe it is necessary to utilize strategies in EMP lexical learning, so they expect to learn more memory strategies from their instructors systematically. However, given memory strategies play an essential role in EMP vocabulary learning, there are also others who do not see the need to utilize strategies since these are arely used in vocabulary learning.

The simple operation of some strategies, such as spelling and repetition strategies, becomes the primary reason for all language proficiency students to use them in EMP lexical learning. Pleasantly, some deep encoding strategies (use of word-structure and association strategies) have been found to be high language proficiency students' frequently used strategies attributing to their role in enhancing memorization and assisting in categorizing lexical items. Evidently, high language proficiency learners do utilize more memory strategies than others. With respect to the characteristics of various memory strategies, students opt for different strategies in lexical learning and strategy use has been noted to have positive and negative effects and influences on participants' EMP vocabulary learning. The positive effects are primarily about improving vocabulary learning speed and lexis size, saving time and energy in learning lexical items and extending word retention. On the other hand, negative influences are caused by difficulty encountered in constructing strategies, lack of sufficient time and effort in selecting strategies, and not systematically learning memory strategies.

## 6. Recommendations

Some recommendations are hereby proposed to further improve EMP vocabulary teaching and learning quality.

The first is to cultivate students' consciousness of using memory strategies. As is known, EMP lexical items are vast and complex, and most students have certain difficulties pronouncing and writing the words. It is found that learners quickly memorize words using strategies in the previous part. However, as found in this study, students only use limited strategies in vocabulary learning. Therefore, it is

necessary to cultivate awareness of using strategies to assist learners in remembering words efficiently and to foster habits of using memory strategies.
Next, it is necessary to create a language environment suitable for EMP vocabulary learning. EMP teaching and learning is generally considered to lack exposure to natural language environment, while classroom teaching and learning time is limited. Hence, the opportunity for students to practise EMP vocabulary is also limited, making it necessary to create extracurricular vocabulary learning environments, immersing students in the EMP language environment beyond the classroom context. For example, participating in international medical conferences in extracurricular time is a valuable attempt to create conditions for practising and using vocabulary.

The third is to carry out medical terminology elective courses. Universities can provide medical students with opportunities for further learning medical lexis by opening elective courses, so students can apply to learn the course according to their language proficiency and actual needs. Elective courses can be set according to different topics such as the digestive system, respiratory system, and endocrine system, instructing students to be familiar with relevant modules and master more EMP words.

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