Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

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Abstract
The current study aims at exploring the attitude of ESP students towards using mind mapping in learning vocabulary. The research design is quasi-experimental. The sample of the study consisted of 29 students from the college of engineering at the Arab Academy for Science, Technology and Maritime Transport, Egypt. A questionnaire was used to investigate the attitude of students towards using mind maps in learning ESP vocabulary. The results of the study revealed that students were interested in using the mind mapping strategy in learning ESP vocabulary and the significant features of mind map; namely: Colors, branches and pictures. Based on the findings, it is recommended that researchers delve deep into studying the mind mapping strategy and its relation to students’ learning preferences and that teachers apply them when teaching vocabulary items. The researcher also recommends a model to evaluate vocabulary learning techniques that can be used in future studies.

Keywords: Mind Maps, Teaching ESP Vocabulary, Vocabulary Learning Strategies, Attitude towards ESP Vocabulary Learning
1. Introduction

Educational Psychology has been of great magnitude to education professionals and scholars due to its tremendous impact on the emergence of a variety of methodologies. Nezhad (2011) states that Educational Psychology has long been an element of teacher training, progressing from being a focal point in many programmes to being viewed as irrelevant by some, to current worries regarding its role in teacher education and teaching reform. Poulou (2005) placed a great emphasis on the importance of this domain stating that Educational Psychology is now seen as an integral part of teacher training and professional development, rather than a separate course that was once seen to be unrelated to teaching practice.

There have been several definitions of Educational Psychology produced by many prominent scholars such as David Berliner (2006), who described Educational Psychology as a scientific study that uses psychological concepts and research methodologies to better understand how the diverse qualities of students, teachers, learning tasks, and educational contexts interact to produce the everyday behaviours seen in schools. Woolfolk (2016, p. 30) defines Educational Psychology as “the study of development, learning, motivation, teaching, and assessment in and out of schools.” Fetsco and McClure (2005) argued that educational psychology is concerned with the qualities of effective instruction and the nature of the learners. It entails the investigation of a variety of phenomena, including memory, cognitive growth, motivation, and self-control. Furthermore, Educational Psychology contributes to teachers’ personal philosophy of learning and teaching as well as helps teachers to understand the factors of effective teaching (Duchesne & McMaugh, 2018).

The study aimed at investigating the attitude of students towards using the strategy of mind mapping in learning English-for-engineering vocabulary and to explore the aspects that attract students to use mind maps as a technique to learn ESP vocabulary. The current study targeted Egyptian students who studied English-for-engineering as one of their courses in the college. A questionnaire was given to them in an attempt to explore their attitude towards the mind mapping strategy. The number of the students who took part in the questionnaire was only 29. The small sample size means that the study findings cannot be generalized to all other Egyptian students. Another limitation is related to the level of proficiency of the students. In order to study ESP vocabulary, students have to be at a certain level of English proficiency not less than A2 according to the CEFR.

The study attempts to answer the following research questions:

1) What is the attitude of engineering students towards using mind maps as a technique to learn ESP vocabulary according to the suggested model?

2) What features of mind maps are considered significant in the students’ point of view?
2. Literature Review

The process of learning includes acquiring and modifying several elements in order to master a language such as knowledge, skills, strategies, attitudes, beliefs and behaviours (Schunk, 2012). Furthermore, Richards (2015) draws attention to the fact that with the suitable resources provided by teachers, the right techniques and the desire of learners, effective learning can occur. Mitchell and Myles (2004) provided a model of second language learning that was proposed by Spolsky (1989, p.28). This model as shown in Figure 1 below encapsulated the views of Spolsky on the relationship between contextual factors, individual learner differences, learning opportunities, and learning outcomes. The boxes in the middle (age, personality, capabilities and previous knowledge) represent the learning variables which lead to the success or failure of the individual’s learning process in the view of Spolsky.

Figure 1

*Spolsky’s General Model of Second Language Learning*

*Note. Second Language Learning Theories. Spolsky (1989, p. 28).*
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

In the changing scenario of language learning approaches and theories, where learners become the center of the teaching methodologies nowadays, attitude has a vital role to play in maximizing learning and teaching output (Ahmad, 2015). Embi (2018) also stated that “Language learning could be moderated or navigated by individual differences”. Fakeye (2010) corroborated this view stating that a learner’s attitude is an important personal variable that affects language learning. Brown (2007) referred to the fact that learners’ attitude can sometimes determine the success of a method or a theory. That was obvious when he criticized the audio-lingual method which capitalizes on the theory of habit formation, behaviourism, for the reason that students felt bored of the incessant parroting; in other words, drilling. Another example mentioned by Hutchinson and Walters (1987) states that the emotional reaction to the learning experience is the fundamental foundation for the start of the cognitive process. The following model from Hutchinson and Waters (Fig. 2) shows the relationship between the affective factors and the learning theories.

**Figure 2**

*positive Learning Cycle*


Setiyadi (2020) believes that language learning progress depends on the three factors: linguistic, social and psychological factors that play pivotal roles in determining whether language learning is a success or not. Asghar et al (2018) argued that there are some factors which influence
the process of language learning leading eventually either to learn and master the target language
or fail to achieve this goal. Those factors are motivation, attitude, anxiety, learning achievement,
apptitude, intelligence, age and personality. Ditual (2012) confirms that psychological factors like
motivation and attitude should be taken into account during the learning process; otherwise, the
language learning process will be a complete failure, and that attitude and motivation are complex
factors that affect learners’ approach to language learning.

2.1. Attitude and Motivation

Astitude to language learning was acknowledged as a matter of controversy for the last two
centuries and was studied broadly for that reason. Snowman et al. (2009) states that Vygotsky
believed in the importance of the psychological tools to aid our mental functioning. Lambert (1963)
suggests a social psychological theory that puts a great emphasis on the cognitive factors such as
intelligence and aptitude along with the affective factors such as attitudes and motivation. He states
that the extent to which a person acquires a second language could incredibly depend on motivation
and attitudes towards the other community and intentions for language learning. Attitude was
originally defined as a readiness to respond to the world or a person’s physical orientation or
posture (Galton, 1884). Richard, (2016) defined Attitude as a psychological construct. It is a
mental and emotional entity that inheres in, or characterizes, the person. It has also been called a
"hypothetical construct," a concept that cannot be observed directly but can only be inferred from
people’s actions. Furthermore, Allport (1935) states that attitude can be formed from a person's past
and present. Sobmolinggo and Alieto (2020) add that “external behavior is enough as predictor of
attitude”.

Beckler (1984), identified three components of a person’s attitude, which are called the ABC
Model. Each letter refers to a different component. A refers to Affect, B refers to Behaviour and C
refers to Cognition. They are all represented in the following figure.

Figure 3

Components of Attitude.

The affective component refers to the linkage of feelings and emotions to an attitude object. What demonstrates this best is humans’ fear of some insects such as scorpions because of their poisonous trait that eventually leads to a negative attitude based on emotions. Behaviour is the second component that refers to an attitude that influences the way we act. It also includes our intentions and verbal statements. The last component is the cognitive one. It refers to the thoughts and beliefs one could hold towards an attitude object.

A famous theory that approached attitude is the Theory of planned behaviour (TPB) proposed by Icek Ajzen in 1985. It is an extension of the theory of Reasoned Action (TRA), (Ajzen, 1991). Godin (1993) explains that the primary goal of the theory of reasoned action is to understand and, subsequently, predict social behaviour. For this to happen, behaviour must be specified under volitional control and then performed in a certain situation. According to Ajzen and Fishbein (1980), the attitude construct or determinant is formed by the beliefs and thoughts one holds concerning the performance of a behaviour. Two factors influence our attitude: the consequences of behaviour and our evaluation of the consequences in terms of their positivity or negativity. The second determinant of intention is the normative beliefs or the subjective norms. It refers to how much social pressure one can feel towards performing certain behaviour. This determinant is predicated on two factors: firstly, our perception of the expectations of the others such as family and friends, and secondly, our motivation to comply with these perceived expectations. The third determinant that leads directly to behaviour without having to do with the intention sometimes is the perceived control over something. It is the determinant that formed the Planned Behaviour Theory (TPB). This determinant is significantly influenced by two elements. The capability is the first and the confidence to do a certain behaviour is the second one (Ajzen, 1991). The following graph (Figure 4) explains the theory.

Figure 4

The Theory of Reasoned Action and Planned Behavior.

According to Dornyie (1994), attitude and motivation are different key terms in educational psychology. He states that the term attitude is basically mentioned in social psychology in which actions are identified as the function of social context and relational patterns. In addition, he argues that motivation is seen as the motor for human behaviour in the individual setting and thereby focuses on the concepts of needs, drives and instincts, and personality traits. Recently, it has focused on failure, achievement, and self-esteem. As for the relationship between attitude and motivation, it was determined by Chalak and Kassaian (2010) when they stated that a positive attitude, to a great extent, strengthens motivation and learners’ attitudes towards language learning and it is developed throughout their experiences, and it may change through time.

2.2. Mind Maps

Despite the fact that a lot of effort has been exerted so as to discover and implement successful techniques and strategies in teaching English as a second language, still there are problems facing teachers and students in the language classroom. Therefore, the demand for an innovative and adaptable strategy in teaching and learning language has become essential in recent years (Buran & Filyukov, 2015). Mind Mapping is considered an innovative way of keeping ideas in your brain and taking them out as well (Edwards & Cooper, 2010).

Figure 6
Both Sides of the Human Brain and their Functions.

Note. The Evaluation of Using Mind Maps in Teaching (Stankovic et al., 2011).

Humans use both sides of the brain to process information; the right hemisphere is responsible for rhythm, spatial perception, gestalt (Wholeness), daydreaming, imagination, colour and size whereas the left hemisphere is responsible for words, logic, numbers, strings, linearity, analysis and lists (Stankovic et al., 2011). Students and teachers can use mind maps for notetaking, brainstorming, problem-solving, memorization, planning, researching, consolidating information
from multiple sources, presenting information and finally, gaining insight on a complex topic (Adodo, 2013). Burgess-Allen and Owen-Smith (2010) stress the importance of mind mapping by stating that one of its merits is that it reflects human’s natural thinking pattern which is thought to be non-linear.

Mind maps are known under various names such as concept maps, semantic maps, knowledge maps, think-links, graphic organizers and cognitive maps (Al Naqbi, 2011). Wang, Lee and Chu (2010) state that mind maps make ultimate use of lines, colours, characters, numbers, pictures and symbols for the purpose of recording thoughts and information. A report on different graphic organizers prepared by Hall and Strangman (2002) differentiated between graphic organizers based on their purposes to best suit various types of information. The following figure illustrates the difference between types of maps.

Figure 7

*Graphic organizers according to Hall and Strangman (2002)*

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive or Thematic Map</td>
<td>Used for mapping generic information and hierarchical relationships</td>
</tr>
<tr>
<td>Network Tree</td>
<td>Used for hierarchical set of information, reflects superordinate and subordinate elements</td>
</tr>
<tr>
<td>Spider Map</td>
<td>Demonstrates information or words relating to a main idea</td>
</tr>
<tr>
<td>Problem and Solution Map</td>
<td>Used to present information that contain cause and effect</td>
</tr>
<tr>
<td>Problem-Solution Outline</td>
<td>Helps students to compare different solutions to a problem</td>
</tr>
<tr>
<td>Sequential Epochic Map</td>
<td>Used to map cause and effect</td>
</tr>
</tbody>
</table>
### Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

<table>
<thead>
<tr>
<th>Mind Map Type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishbone Map</td>
<td>Used when cause-effect relationships are complex and non-redundant</td>
<td><img src="image" alt="Fishbone Map" /></td>
</tr>
<tr>
<td>Comparative and Contrastive Map</td>
<td>Used to compare and contrast two concepts according to their features</td>
<td><img src="image" alt="Comparative and Contrastive Map" /></td>
</tr>
<tr>
<td>Compare-Contrast Matrix</td>
<td>Also used to compare concepts</td>
<td><img src="image" alt="Compare-Contrast Matrix" /></td>
</tr>
<tr>
<td>Series of Events Chain</td>
<td>Helpful when organizing information according to various steps and stages</td>
<td><img src="image" alt="Series of Events Chain" /></td>
</tr>
<tr>
<td>Cycle</td>
<td>Used when there is no absolute beginning or ending of a process or when information is cyclical, a cycle is helpful</td>
<td><img src="image" alt="Cycle" /></td>
</tr>
<tr>
<td>Human Interaction Outline</td>
<td>Used for a chain of actions and reactions</td>
<td><img src="image" alt="Human Interaction Outline" /></td>
</tr>
</tbody>
</table>

**Note.** Adapted from Hall and Strangman (2002)

As shown in figure 7, 12 types of mind maps have been researched by Hall and Strangman (2002). Various concepts can be illustrated through using these different mind maps. The descriptive map, for example, is used to present generic information and hierarchical relationships between different concepts. Problem-solution mind maps can also be used to present information that contain cause and effect as well as to compare different solutions to a problem. The cycle mind map serves to present theories or concepts with no absolute beginning or ending. In conclusion,
using the suitable mind map makes it easy to present concepts and theories according to their nature and their purposes.

3. Methodology

3.1. Research Design

This research is applied, mixed-method and exploratory. It is applied because it has an experiment that needed a sample to be applied upon and then discovered what the outcome was after the intervention of the researcher. It is a mixed-method approach, qualitative and quantitative because the researcher analyzed the information discovered by the quantification method. It is also an exploratory research type as it attempted to investigate what was going to happen if the strategy of mind mapping was applied to students. This research is quasi-experimental. Quasi-experimental research was defined by Melhem (2000, p. 217, as cited in Othman, 2018) as “a method in which the variables that affect a phenomenon are controlled except for one variable the researcher manipulates and changes to measure its effect on the phenomenon.”. In this case, the independent variable is the strategy of mind mapping whereas the dependent variables are vocabulary learning and students’ English proficiency.

3.2. Sample and Tools of the Study

A sample of 29 students from the college of engineering participated in the study. They enrolled in the ESP 1 course. The course covered the semester. To address the questions of the study, the researcher designed a questionnaire. The questionnaire starts with a description that provides some information for the questionnaire takers in order to understand what it is about. The description makes it easy for the takers to understand what they are going through and how to answer. It also encourages them to be cooperative and honest when providing their answers. The questionnaire consists of two parts that contain 16 questions. The first part is the demographics part, and it has only 2 questions asking about the gender and the age of the students. The second part of the questionnaire is mainly concerned with mind mapping. It consists of 14 questions mainly about the aspects of mind maps and whether students like the technique or not. Only one question is placed at the end of the questionnaire for adding any extra information. The first 14 questions in part 2 are fundamentally based on a five-point Likert Scale as the takers choose among strongly agree, agree, neutral, disagree and strongly disagree. The purpose of the questions is to uncover whether mind maps are effective in learning ESP vocabulary or not from the students’ point of view. The questions also aim at exposing whether students are going to use mind maps in their daily life or not. Moreover, the questions try to discover if the mind maps’ aspects are helpful or not from the students’ perspectives.
3.3. Study Procedures

The researcher identified the syllabus units that needed to be taught and introduced mind mapping in the teaching process in two different ways. The first was through the gap-fill activity in which students were filling in the missing-words spaces in groups and during the class time. The second way was through the summary activity as the students had to work on their own to summarize the vocabulary they have learned from the lesson and the unit. The first activity was implemented in class, in groups and students were given feedback on their answers from their peer students and from the instructor. The second activity was at home as students answered individually on their own and they were given feedback by the instructor only. The researcher taught the college of engineering students with mind mapping online. He used the Zoom program to teach students online for 10 weeks. On the last day, the researcher gave the experimental group of students a questionnaire to check their attitude towards the technique of mind mapping as a way to learn the ESP vocabulary. The findings were analyzed and interpreted afterwards.

3.3.1. Questionnaire Analysis Suggested Model

This model was suggested to analyze and interpret the frequencies of the questionnaire in the best possible way. The following figure illustrates the model visually.

**Figure 8**
*A Suggested Model for Analyzing Students’ Attitude towards Using Mind Maps.*

As shown in figure 8, the researcher explored the attitude of students towards using mind maps depending on a four-component model. The model suggests that the attitude of students is constituted of four components (a) Cognitive, (b) Affective, (c) Behavioural, and (d) Learning environment. Responses of students to the questionnaire items were analyzed and interpreted depending on this categorization.

In the suggested model, the cognitive component involves the perception of students of the level of difficulty of ESP vocabulary and their perception of the organization of vocabulary in their minds. To most students, learning ESP vocabulary is considered a hard process because this type
of vocabulary is field-specific, not known to common people and is not used in everyday conversations except with people working or studying in the same field. ESP words are sometimes long, compound, representing various field-specific names of items. Therefore, learning and memorizing these words is sometimes difficult. As for the process of vocabulary organization, it is concerned with the human brain and requires much effort from students because it eventually leads to the memorization and the retention of ESP vocabulary.

The affective component involves students’ emotional perception of the technique. This component expresses how students feel when using the mind mapping technique. The feeling of boredom sometimes dominates the classroom when a teacher is lecturing the students or using an old-fashioned technique to teach vocabulary or any other language systems or skills. According to Krashen (1985), negative emotions are formed through the passive moods, including low motivation, low self-esteem, and anxiety. Similarly, Oxford (1996) argues that the affective side of the learner is probably one of the biggest influences on language learning success or failure. That is why students’ emotions and passion are very important in the process of learning. Teachers have to keep this in mind when teaching so that their methods and techniques would eventually lead to successful language learning and effective language lessons.

The behavioural component involves students’ intention to use the technique. Since behaviour is connected to attitude as suggested by the theory of Reasoned Action and its extension, the theory of Planned behaviour. I deduced that a component of the attitude construct is the intention of a person that eventually leads to behaviour. Based on that, students should be asked directly whether they are going to use the technique of mind mapping to learn ESP vocabulary or not because their intention, to some extent, will eventually lead to behaviour.

The component of Learning environment involves the atmosphere created while using the technique and students’ engagement during the time of using mind maps as perceived by students. If a teacher uses techniques that are engaging and by which students may have fun and learn, students will have passion towards learning and the atmosphere created in the process of learning will enthuse students to learn more. This may not only be an engagement matter but also a partially mindset-changing process. As a result, students may decide to learn using certain techniques such as the mind mapping technique due to the fun and the engagement they feel and experience during the learning process.

4. Findings and Discussion

The interpretation of the questionnaire frequencies depended on 4 components suggested by the researchers; namely: the cognitive component, the affective component, the behavioural component and finally the learning environment component.
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

4.1. Cognitive Component

The cognitive component in the researcher’s model includes the perception of students of the level of difficulty of ESP vocabulary and the organization of vocabulary in the students’ minds. It exposes students’ attitude in terms of the mental process performed to learn ESP vocabulary.

Table 1

Cognitive Component Frequencies

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- I find Learning Engineering English vocabulary difficult.</td>
<td>2 (7%)</td>
<td>7 (24%)</td>
<td>15 (52%)</td>
<td>5 (17%)</td>
<td>0 (0%)</td>
<td>3.2</td>
</tr>
<tr>
<td>2- Using Mind maps makes it easy for me to remember ESP Vocabulary.</td>
<td>8 (28%)</td>
<td>15 (52%)</td>
<td>6 (20%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>4.1</td>
</tr>
<tr>
<td>3- Mind maps organize vocabulary in my mind.</td>
<td>7 (24%)</td>
<td>18 (62%)</td>
<td>4 (14%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>4.1</td>
</tr>
<tr>
<td>12- Branches of mind maps are attractive, and they make it easy to organize types of vocabulary.</td>
<td>9 (31%)</td>
<td>15 (52%)</td>
<td>4 (14%)</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Note. Questions 1, 2, 3 and 12 illustrate the cognitive component of students’ attitude.

As shown in table 1, four statements represented the cognitive component of students’ attitude towards the mind mapping technique. 52% of students were neutral about their perception to the level of difficulty of studying ESP vocabulary. 24% of students agreed that ESP vocabulary is difficult to study and 7% of the students strongly agreed. Only 5 students disagreed. The mean rank for question number 1 was 3.2. 80% of students in statement 2 strongly agreed and agreed that mind maps make it easy for them to remember ESP vocabulary. 20% of students were neutral about this statement and no one disagreed. The mean rank for this question was 4.1. In question 3, 86% of students agreed that mind maps organize vocabulary in their minds. 14% of students were neutral and no student disagreed. The mean rank was 4.1. 24 students strongly agreed and agreed about statement 12 that mind maps can have attractive branches that organize the types of vocabulary in their minds while 4 students were neutral and only one student disagreed. The mean rank of this question is 4.1. The cognitive component frequencies and the mean ranks suggest that mind maps made students’ cognitive processes easier and made their perception towards mind maps positive.
4.2. Affective Component

The affective Component includes students’ emotional perception towards using the technique of mind mapping in learning ESP vocabulary. It uncovers whether students feel enjoyed or bored and the signs of their enjoyment or boredom.

Table 2

Affective Component Frequencies

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>6- I find creating mind maps to learn ESP vocabulary boring and difficult.</td>
<td>2 (7%)</td>
<td>6 (21%)</td>
<td>4 (13%)</td>
<td>11 (38%)</td>
<td>6 (21%)</td>
<td>2.6</td>
</tr>
<tr>
<td>9- While creating mind maps, I felt the time passes very fast because I enjoyed creating the maps.</td>
<td>4 (14%)</td>
<td>14 (48%)</td>
<td>7 (24%)</td>
<td>3 (10%)</td>
<td>1 (4%)</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Note. Questions 6, 9, express the students’ emotional perception towards mind mapping.

As table 2 illustrates, two statements targeted the affective component in the attitude questionnaire. In statement 6, 28% of students strongly agreed and agreed that mind maps were difficult to create whereas 13% were neutral. On the other hand, 59% of students disagreed with this statement. The mean rank here was 2.6. For statement 9, 18 students felt time passed fast because of the enjoyment they felt while creating mind maps. 7 students were neutral, 3 disagreed and only 1 strongly disagreed. The mean rank was 3.6. The frequencies of the affective component and the mean ranks suggest that students liked mind maps and that they enjoyed creating them in ESP classes.

4.3. Behavioural Component

The behavioural component represents the engineering students’ intention to use the technique of mind mapping to learn ESP vocabulary. The intention is also reflected on their behaviour.
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

Table 3

*Behavioural Component Frequencies*

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4- I will use mind mapping in my everyday vocabulary learning outside the class.</td>
<td>3 (10%)</td>
<td>14 (48%)</td>
<td>8 (28%)</td>
<td>4 (14%)</td>
<td>0 (0%)</td>
<td>3.6</td>
</tr>
<tr>
<td>5- It makes no difference whether I use mind maps or not.</td>
<td>3 (10%)</td>
<td>8 (28%)</td>
<td>6 (21%)</td>
<td>11 (37%)</td>
<td>1 (3%)</td>
<td>3.03</td>
</tr>
<tr>
<td>7- Creating mind maps to learn ESP vocabulary is a waste of time.</td>
<td>2 (7%)</td>
<td>4 (14%)</td>
<td>5 (17%)</td>
<td>9 (31%)</td>
<td>9 (31%)</td>
<td>2.3</td>
</tr>
<tr>
<td>8- Creating a mind map is a time-consuming task.</td>
<td>2 (7%)</td>
<td>12 (41%)</td>
<td>10 (34%)</td>
<td>4 (14%)</td>
<td>1 (4%)</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Note. Questions 4, 5, 7 and 8 represent the behavioural component

Table 3 illustrated the students’ behavioural component in their attitude towards using mind maps in their study of ESP vocabulary. In statement 4, 58% of students confirmed that they will use mind maps in learning vocabulary outside their ESP classes and in their everyday vocabulary learning. 28% of students were neutral and 14% of students disagreed. The mean rank was 3.6.

Statement 5 frequencies were quite equal as 11 students strongly agreed and agreed that there was no difference whether they use mind maps or not whereas 12 students strongly disagreed and disagreed. 6 students were neutral here and the mean rank was 3.03. 62% of students strongly disagreed and disagreed that mind maps were a waste of time while 21% of students strongly agreed and agreed with this statement. 17% of students were neutral and the mean rank was 2.3.

14 students strongly agreed and agreed that mind maps consumed time when creating them. 10 students were neutral, and 4 students strongly disagreed and disagreed. The mean rank was 3.3. The frequencies suggest that the behavioural component of students’ attitude was positive as the students stated that they would use mind maps in learning ESP vocabulary and that they were not a waste of time even though they sometimes consumed time to create them.

4.4. Learning Environment Component

The Learning environment component seeks to uncover the perception of students of the atmosphere created when using the technique of mind mapping in learning ESP vocabulary. Two statements addressed this component 10 and 13. Both statements mentioned the characteristics of an effective learning atmosphere which are relaxation, stress-free and engagement in the activity and the learning process in general.
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

Table 4

*Learning Environment Component frequencies*

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>10- Creating mind maps ensures a relaxing and a stress-free atmosphere.</td>
<td>2 (7%)</td>
<td>14 (48%)</td>
<td>9 (31%)</td>
<td>3 (10%)</td>
<td>1 (4%)</td>
<td>3.4</td>
</tr>
<tr>
<td>13- During creating the mind maps, I was engaged in the activity.</td>
<td>5 (17%)</td>
<td>14 (48%)</td>
<td>9 (32%)</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>3.8</td>
</tr>
</tbody>
</table>

*Note.* Questions 10, 13 illustrate the environment component in students’ attitude

In table 4, there were two statements that targeted the learning environment created when using the mind mapping technique. 55 % of the students confirmed that mind maps create a relaxing atmosphere that is free of stress while only 4 students disagreed, and 9 students were neutral about this statement. The mean rank here was 3.4. As for the activity engagement, 65% of the students stated that they were engaged in the activity and only 1 student stated that he was not engaged in the activity. Also, 9 students were neutral in this statement. The mean rank was 3.8. Based on the students’ responses and the mean rank, the learning environment created while using the technique is positive from the students’ point of view.

4.5. **Attitude Questionnaire Frequencies**

The suggested model evaluated the students’ attitude based on four components: the cognitive component, the affective component, the behavioural component and the learning environment component. Each component discussed a few points reflected in the sentences and questions of the questionnaire as revealed in the findings chapter.

The attitude of students was positive when it came to the cognitive component as they first admitted the difficulty of studying ESP vocabulary. Then they agreed that the mind mapping technique made things easier when learning ESP vocabulary and that it organized different types of vocabulary in their minds. As for the affective component, most students disagreed when told that mind maps were difficult and boring. They even stated that they felt time passes fast because of the enjoyment they felt when using mind maps. Therefore, the affective component came positive as well.
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

The behavioural component expressed students’ intention to use the mind mapping technique when learning ESP vocabulary. Students stated that they would use mind maps and that they were not a waste of time and that they could be created fast without taking time to do so. The last component to explore the students’ attitude towards mind maps was the learning environment component. Almost all students stated that mind maps created a stress-free atmosphere and that they increased the engagement level of students in the activity.

All in all, the attitude of the students towards the mind mapping technique as a tool to learn ESP vocabulary was positive as students have shown interest and intention to use it. The study findings concerning the attitude of students agree with other studies such as Dulksnienė et al. (2021), Sapitri et al. (2019) and Buran and Filuyokov (2015).

4.6. Significant Features of Mind Maps

The features that helped students learn ESP vocabulary were the colours used to highlight different types of vocabulary, the vocabulary pictures brought by students in order to memorize and retain vocabulary and before all to know the meaning of a word or a phrase. The last feature of mind maps was the branches students used to draw out of the central theme word. They were different and personalized as some students drew them straight; others drew them in different shapes and lines that best suited their personalities.

Table 5
Features of Mind Maps Frequencies

<table>
<thead>
<tr>
<th>Questions</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Mean Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>11- Using colors and pictures in a mind map helps me to remember the vocabulary better.</td>
<td>11 (38%)</td>
<td>13 (44%)</td>
<td>4 (14%)</td>
<td>0 (0%)</td>
<td>1 (4%)</td>
<td>4.1</td>
</tr>
<tr>
<td>12- Branches of mind maps are attractive, and they make it easy to organize types of vocabulary.</td>
<td>9 (31%)</td>
<td>15 (52%)</td>
<td>4 (14%)</td>
<td>1 (3%)</td>
<td>0 (0%)</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Table 5 revealed the students’ responses to statements 11 and 12. Those statements targeted the features of mind maps which were helpful to students in learning ESP vocabulary. More than 80% of the students agreed that colours and pictures helped them remember vocabulary better whereas only 1 student disagreed. Almost the same proportion of students confirmed that the
branches of mind maps made it easier for them to organize different types of vocabulary. The mean rank for statements 11 and 12 was 4.1.

The frequencies of both statements revealed that the features which were helpful to students were colours, pictures and branches because they organized vocabulary. They were also personalized which means that the students could choose any colours they wanted to mark different types of vocabulary and they could put pictures with words to know the meaning of words. The branches also could be drawn in an attractive way to make the map look beautiful.

Three features of mind map were identified to be liked and helpful by students in learning ESP vocabulary. The first one was the colours. Students got to choose any colours they liked to mark the same types of vocabulary. For example, if learners are trying to learn different car parts, they can mark the interior parts with the blue colour and the exterior parts with the red colour.

The second feature was the pictures. Pictures served as some sort of clarification for the meanings of words, and they gave a beautiful view of the mind map. The third feature was the branches of mind maps. Branches were also attractive because students drew them in a way that made mind maps very beautiful. Of course, students had their own imaginary perceptions of mind maps and they drew them according to their personal preferences.

Students were asked whether they liked the features of mind maps or not. They agreed that the colours and the pictures in the mind maps help them remember the vocabulary better and that the branches of the mind maps help them organize different types of vocabulary. Therefore, colours, pictures and branches are useful and helpful features that enable the students to remember and to organize vocabulary in their minds.

5. Conclusion

The study investigated learners’ attitude towards using mind maps in learning ESP vocabulary by using a questionnaire. The researcher delivered 10 online sessions using mind maps to teach ESP vocabulary to the college of engineering students at the AASTMT. The sample of the study was 29 students. The researcher suggested a model of interpretation for the questionnaire frequencies. Students responses were positive towards mind maps and some of them expressed their intention to use the strategy when learning ESP vocabulary.

In the light of the current study, it is recommended to conduct research on the attitude of students towards the techniques used in teaching different skills in classrooms and any effective techniques in teaching and learning ESP vocabulary. For instance, exploring the attitude of students and teachers towards the use of concept maps in understanding difficult topics in different fields because concept maps are not only restricted to the English learning discipline. For example, they
can be used in understanding science courses for different age groups such as elementary schools’ science courses or secondary schools’ science and math courses.

After having interpreted students’ perception of the mind mapping technique in learning ESP vocabulary depending on a suggested model that consisted of four components namely: cognitive, affective, behavioural and learning environment, I would suggest another model for future research that would help scholars interpret frequencies taken form students’ responses in questionnaires or interviews or any data collection tool. The following figure explains the model.

Figure 9
A hypothesized Six-component Model for Future Interpretation of Students Attitude towards Vocabulary Learning Techniques

The researcher hypothesized the above model to measure students’ attitude towards techniques used to learn ESP vocabulary and to interpret their responses. The model includes six components: affective, cognitive, behavioural, learning environment, characteristics and context. To explain more, the Affective component is concerned with the students’ emotional preference and whether they like or dislike a certain strategy in learning vocabulary. The cognitive component is more or less about students’ perception of the mental processes activated for vocabulary learning such as understanding the meaning, knowing how to use a word or a phrase and organizing types of vocabulary for memorization and retention. The third component is the behavioural one. It is
Exploring the Attitude of ESP Learners towards Using Mind Mapping in Learning Vocabulary

A. S. Wannas, I. H. Hassan & M. M. Abdel Mohsen

associated with the intention of students to use a technique to learn vocabulary and whether they are motivated to use it. The learning environment is a component that reveals the atmosphere created and surrounded students while learning vocabulary and how students used the strategy, individually, in pairs or in groups?

The newly-added components are the characteristics component and the context component. The former component is concerned with the helpful features that could be useful in the process of learning vocabulary such as pictures, colours or any useful materials used with vocabulary learning techniques in order to make vocabulary learning easier. The latter one shows how students perceive vocabulary learning techniques in terms of the suitability for their age, course type and objectives, and language proficiency. The researcher encourages scholars and teachers to use this model whenever possible to analyze the attitude of learners towards strategies and techniques used in language learning classes.

References


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