

**VIETNAM NATIONAL UNIVERSITY, HANOI
UNIVERSITY OF LANGUAGES AND INTERNATIONAL STUDIES
FACULTY OF ENGLISH LANGUAGE TEACHER EDUCATION**

ĐẶNG THANH ĐIỀM

**USING MIND MAPS AND DIAGRAMS
TO TEACH VOCABULARY FOR FIRST YEAR
mainstream STUDENTS, FACULTY OF
ENGLISH LANGUAGE TEACHER EDUCATION**

Submitted in partial fulfillment of the requirements for

The degree of Bachelor of Arts (TEFL)

SUPERVISOR: VŨ MAI TRANG (M.A.)

Hanoi, 2011

ACCEPTANCE

I hereby state that I: Đặng Thanh Diễm, 07E1, being a candidate for the degree of Bachelor of Arts (TEFL) accept the requirements of the College relating to the retention and use of Bachelor's Graduation Paper deposited in the library.

In terms of these conditions, I agree that the origin of my paper deposited in the library should be accessible for the purposes of study and research, in accordance with the normal conditions established by the librarian for the care, loan or reproduction of the paper.

Signature

ACKNOWLEDGEMENTS

This paper would not have been completed without the support of many people, to all of whom I am profoundly indebted.

First of all, I would like to express my great gratitude to my supervisor, Ms. Vu Mai Trang (M.A.) for her valuable comments, constant support and encouragement.

My sincere thanks also go to my teachers in the University of Foreign Languages and International Studies to whom I owe an enormous intellectual debt. I would like to express my gratitude to Assoc. Prof. Nguyen Thi Phuong Hoa from the Department of Psychology and Pedagogy for her inspiration from which I could develop the idea for this paper. I have also received the encouragement and support from teachers in the Faculty of English Language Teacher Education, Ms. Luong Quynh Trang (M.A.) and Ms. Tran Thi Lan Anh (M.A.). My sincere thanks are due to students of Division I, the Faculty of English Teacher Education for their response to my survey questionnaires and interviews. I am also thankful to my classmates from group 07E1 for their supportiveness, especially my beloved friend, Nguyen Thi Thinh for her constructive comments on my paper and her encouragement all the time when I encountered difficulties in completing the study.

Last but not least, I am truly grateful to my family for their wholehearted care and support during the time I conducted the study. Especially, I want to give my sincere thanks to my younger brother, Dang Van Muoi – a second year student at University of Technology and Engineering – for his tutor on mathematics and excel applications to me.

ABSTRACT

Learning vocabulary is an emphasis at the Faculty of English Language Teacher Education where it is always mentioned in the objectives of the four skills (Speaking, Listening, Reading and Writing). In order to bring mind mapping and diagrammatic techniques into practice popularly at Division I, the study first intended to find out the current application of the techniques to teach vocabulary for first year mainstream English majors. Secondly, it aimed at figuring out whether the techniques work to teach vocabulary at Division I. The study began with the literature review on vocabulary teaching and the application of mind maps and diagrams in teaching vocabulary. Then the paper-based questionnaires were delivered to students to explore the situation of the research problem. After that, the true-experimental method was applied in data collection procedures to fulfill the second aim of the research. The findings of the study indicated that mind maps and diagrams were applicable and effective to teach vocabulary at Division I. Therefore, the techniques were suggested to be exploited more in the context of teaching vocabulary for first year students.

TABLE OF CONTENT

CONTENTS	Pages
Acceptance	
Acknowledgement	i
Abstract	ii
Table of content	iii
List of abbreviations	vii
List of figures and tables	viii
 CHAPTER I: INTRODUCTION	
1. Rationale for the study	1
2. Aims of the study	3
3. Research questions	3
4. Scope of the study	4
5. Significance of the study	4
6. Organization of the study	4
 CHAPTER II: LITERATURE REVIEW	
1. Vocabulary and vocabulary learning	
1.1. Definition of vocabulary	6
1.2. Aspects of vocabulary	7
1.3. How vocabulary is remembered	9
1.4. Presenting new words	12

2. Mind maps and diagrams	
2.1. Definitions of mind mapping and diagrammatic techniques	14
2.2. Classifications of mind maps and diagrams	16
2.3. Advantages of using mind mapping and diagrammatic techniques	20
3. First year mainstream English majors, FELTE	23
4. Related studies	
4.1. Review of related studies worldwide	24
4.2. Review of related studies in Vietnam	25
4.3. Literature gaps	26
 CHAPTER III: METHODOLOGY	
1. Method of the research	27
2. Population and Sampling	29
3. Data collection instruments	
3.1. Questionnaires	30
3.2. Vocabulary Tests	30
3.3. Interviews	37
4. Data collection procedures	
4.1. Phase 1	37
4.2. Phase 2	39
4.3. Phase 3	39

5. Data analysis methods and procedures	
5.1. Questionnaire analysis	40
5.2. Test result analysis	41
5.3. Interview analysis	44

CHAPTER IV: FINDINGS AND DISCUSSION

1. Research question 1	
To what extent, mind maps and diagrams are currently used to teach vocabulary for first year mainstream students at Division I?	45
2. Research question 2	
Do using mind maps and diagrams work to teach vocabulary for first year mainstream students at Division I?	50

CHAPTER V: CONCLUSION

1. Major findings of the study	60
2. Pedagogical implication and suggestion	62
3. Limitations of the study	62
4. Suggestions for further studies	63
5. Contributions of the study	63

References	64
-------------------	----

Appendixes	69
-------------------	----

LIST OF ABBREVIATIONS

TESOL	Teacher of English to Speakers of Other Languages
ELT	English Language Teaching
ELTM	English Language Teaching Methodology
TEFL	Teaching English as a Foreign Language
ESL	English as a Second Language
ULIS	University of Languages and International Studies
VNU	Vietnam National University
FELTE	Faculty of English Language Teacher Education
EFL	English as Foreign Language

LIST OF FIGURES AND TABLES

List of figures

- Figure 1: Human Memory System (Adapted from Hedge, 2010)
- Figure 2: Word Spider (Scrivener, 1994)
- Figure 3: Word Networks (Hedge, 2000; 127)
- Figure 4: Requirements of Mind mapping (Buzan, 1993)
- Figure 5: Network tree
- Figure 6: Venn diagram
- Figure 7: Flow chart
- Figure 8: Existential graph
- Figure 9: Event chain
- Figure 10: Bar chart
- Figure 11: Pie chart
- Figure 12: Function chart
- Figure 13: Cycle concept map
- Figure 14: Spider concept map
- Figure 15: Mind map example 1 (Visual Intelligence)
- Figure 16: Mind map example 2 (Mind skills)
- Figure 17: Mind map example 3 (Population and the Planet)
- Figure 18: Benefits of Mind Mapping Technique
- Figure 19: Illustration of Pretest-posttest Designs
- Figure 20: Data collection procedures
- Figure 21: Techniques applied to teach vocabulary
- Figure 22: Vocabulary Teaching Techniques favored by students
- Figure 23: Students' knowing of mind maps and diagrams
- Figure 24: Vocabulary teaching through mind maps and diagrams
- Figure 25: The comparison between average scores in posttest 1 of Control and Experimental Group

List of tables

Table 1: Major aspects of vocabulary (Adapted from Ur, 1996)

Table 2: The sample of the study

Table 3: Vocabulary Test Description

Table 4: Students' scores and the reliability coefficient of the test items in Vocabulary Pretest

Table 5: Students' scores and the reliability coefficient of the test items in Vocabulary Posttest 2

Table 6: Conversion of Percentage Ranges

Table 7: Critical Values t-table

Table 8: Hypotheses

Table 9: Decision Rules

Table 10: Students' scores in the pretest

Table 11: Students' scores of the Experimental Group in posttest 1

Table 12: Students' scores of the Control Group in posttest 1

Table 13: Students' scores of the Experimental Group in posttest 2

Table 14: Students' scores of the Control Group in posttest 2

Table 15: The result of matched t-test calculation 1

Table 16: The result of matched t-test calculation 2

Table 17: Decision Results

Table 18: Mean scores of two groups in vocabulary tests

CHAPTER I: INTRODUCTION

This initial chapter is to clarify the research problem and rationale for the study. Aims of the study are also highlighted with the two research questions, and then the study's scope and significance are introduced. Lastly, it provides an overview of the following chapters in order to guide readers into the right track of the paper.

1. Rationale for the study

During quite a long time from 1945 to 1970, vocabulary was just a “*limbo*” in EFL teaching and learning context (Carter and McCarthy: 41 as cited in Rojas, 2008). The word “*limbo*” indicated that teaching vocabulary was just considered an addition to teaching grammar or simply a by-product of language teaching and communicative functions for many years. Not many studies were conducted on the topic of vocabulary learning. Since the mid-1990s, things have changed with “*a mini-explosion of research on second language vocabulary issues [...]*” (Folse, 2004 as cited in Duppenhaler, 2008) and the role of vocabulary knowledge has been recognized by theorists and researchers. Accordingly, numerous types of approaches, techniques, exercises and practice have been introduced into the field of teaching vocabulary (Hatch & Brown, 1995 as cited in Ghazal, 2007). In other words, vocabulary has gained a higher status with greater interests from researchers, teachers and material designers.

Saleh (1997:12) argues, “[...] *the success in mastering a language is determined by the size of the vocabulary one has learned*”. But it is not only important how many words learned but also how many words remembered (Thornbury, 2002: 33). Involving in word remembering, knowledge of memory sensory has an important value.

Learning new items involves storing them first in short-term memory, and afterwards in long-term memory. There are many factors affecting word storage such as the way words are presented, word frequency or how words are recycled.

Oxford (1990 as cited in Moras, 2001) suggests memory strategies to aid learning, including **a)** creating mental linkages (grouping, associating, placing new words into context), **b)** applying images and sounds (using imagery, semantic mapping, using keywords and representing sounds in memory), **c)** reviewing well in structured way and lastly, **d)** employing action (physical response or sensation or using mechanical techniques). From these strategies, words can be stored in one's long-term memory.

Moreover, it is believed that language learners only use their left brain to acquire vocabulary as it is said that left brain is for logical and rational thinking, including words and languages. The right brain is for feeling, imagination rules, symbols or images; in other words, it is for creativity and visualization. Therefore, learners need to balance the use of the both hemispheres of the brain to think perfectly and get the best results of learning vocabulary (Oxford, 1990).

Mind maps and diagrams are suggested for both memory sensory strategies and the theory of left and right brain combination in learning language. To use mind maps and diagrams is to apply images so that language items can reach long-term memory as well as to stimulate the whole brain by appealing to both creative and logical sides of the brain. Mind maps and diagrams allow students to clarify their thoughts by categorizing and grouping related ideas as Thornbury (2002) says, "*Acquiring a vocabulary requires not only labeling but categorizing skills*".

Lastly, because of the fact that the writer would have her six-week practicum at Division I, students at Division I became the ideal population for the study.

All reasons above paved the way for the writer to study on “*Using mind maps and diagrams to teach vocabulary for first year mainstream students, Faculty of English Language Teacher Education*”, in hope that in case the expected outcomes would be fulfilled, the study could contribute to better the vocabulary teaching and learning for first year mainstream students.

2. Aims of the study

The study aimed at, firstly, exploring the current situation of using mind maps and diagrams to teach vocabulary for first year mainstream students at FELTE. Secondly, that the extent to which using mind maps and diagrams to teach vocabulary works for first year mainstream students at FELTE would be investigated. From the findings of the paper, the writer wanted to test whether it is possible to apply mind maps and diagrams in teaching vocabulary for first year students.

In short, the study finally targeted at introducing using mind maps and diagrams as a technique to teach vocabulary for first year English mainstream majors which should be applied and can work well.

3. Research questions

There are two research questions, based on the two focused objectives of the study accordingly. They are:

- 1) *To what extent are mind maps and diagrams currently used to teach vocabulary for first year mainstream students at FELTE?*
- 2) *Does using mind maps and diagrams work to teach vocabulary for first year mainstream students at FELTE?*

4. Scope of the study

First of all, because of the limitation of time and resources, the study could not cover all aspects in vocabulary teaching and learning. It only focused on the use of mind maps and diagrams as one technique to teach vocabulary.

Regarding the population of the study, students at Division I, FELTE were the participants and respondents to survey questionnaires, interviews, trial lessons and tests.

In details, survey questionnaires were delivered to 100 students. And 30 students took part in control and experimental groups, 15 for each group. These 30 students were involved in trial lessons, pre-test, post-tests and semi-structured interviews.

5. Significance of the study

As the study is finished, it is expected to firstly look back on the use of mind maps and diagrams to teach vocabulary for first year mainstream students at Division I.

Secondly, the findings of the study on whether using mind maps and diagrams to teach vocabulary works in the context of teaching vocabulary for first year mainstream students would be a big help for teachers in their teachings. By having read this study, teachers of Division I can enrich their techniques in teaching vocabulary.

Lastly, for researchers of the same interest in vocabulary teaching or applying mind maps and diagrams in EFL context, the study could serve as a useful and reliable source for related literature.

6. Organization of the study

The study consists of five chapters as follows.

Chapter I – “**Introduction**” covers academic routines required for graduation paper, namely rationale for the study, aims of the study, research questions, scope of the study, significance and an overview of the study’s organization.

Chapter II – “**Literature Review**” provides the theoretical background of the study consisting of some basic knowledge of English vocabulary, mind maps and diagrams in EFL context generally and in teaching vocabulary in particular.

Chapter III – “**Methodology**” describes the method based on which the study is conducted with population and sampling method, data collection instruments, data collection procedures, and analysis procedure.

Chapter IV – “**Findings and Discussion**” presents, analyzes and discusses the results of the data collected. In this chapter, answers for three research questions are sought.

Chapter V – “**Conclusion**” summarizes main issues of the paper, mentioning limitations of the study, pedagogical implications of using mind maps and diagrams to teach vocabulary integrated with skills, and suggestions for further studies.

Summary

The first chapter has provided basic information of the study through the statement of the research problem and rationale for the study, aims and scope of the study. Besides, its significance is also noted. Lastly, the overview of the paper has been introduced.

CHAPTER II: LITERATURE REVIEW

In this chapter, an overview of the literature related to this study is provided, laying the solid foundation for the paper in the next parts. Besides, the target learners for the technique to be applied, the first year mainstream students are also defined. In addition, the review will reveal the literature gap from which the need to carry out this study is rationalized.

1. An overview of vocabulary

1.1. Definition of vocabulary

As earlier stated, the teaching and learning of vocabulary were neglected during a long period of time, making it the Cinderella amongst all the language components required when learning a language (Rojas, 2008). But now, vocabulary is quite a frequently-used term in English language teaching and learning. Hence, it is essential to clarify this term in this study as it will be mentioned all the time.

Regarding vocabulary, agreement on its definition seems to be difficult as each scholar and linguist or even each English learner has his own set of ideas to come up with the precise definition of vocabulary. Thus, there have been many differences in defining it.

According to Cambridge Advanced Learner's Dictionary Online, vocabulary is defined as a) all the words that a person knows or uses, b) all the words in a particular language, c) the words that people use when they are talking about a particular subject and d) a list of words with their meanings, especially in a book for learning a foreign language. Hornby (2000: 1331) defined vocabulary as "a list of words in a language with their meanings", which is in common with the third and fourth meanings from the definition of the dictionary.

Cited in Nguyen (2010), Ur (1996:60) defined the concept of vocabulary as

“[...] the words we teach in the foreign language. However, a new item of vocabulary may be more than a single word: for example, post office and mother-in-law, which are made up of two or three words but express a single idea. There are also multi-word idioms where the meaning of the phrase cannot be deduced from an analysis of the component words. A useful convention is to cover all such cases by talking ‘items’ rather than ‘words’ [...]”.

From from all the above discussions about *vocabulary*, there is also a need to elaborate *word*. Word is a single unit of language which means something and can be spoken or written (Oxford Advanced Learners’ Dictionary). Regarding the connection of words and vocabulary, McCarthy (1995) also asserts that “[...] when we speak of the vocabulary of a language, we are speaking primarily, but not exclusively, of the words of that language [...]” (cited in Ngo, 2009). Therefore, just that understand it simply that a word is one part of a vocabulary.

To conclude, there are numerous ways to understand the concept of “vocabulary”. Besides, here arises the problem of whether “words” and “vocabulary” has the same indication. In this paper, there is no differentiation in use between “words” and “vocabulary” to refer to all the words that existed in a language, which can transmit and express ideas. However, when “word” is used, it refers to a single word only as the smallest unit of language to convey ideas.

1.2. Aspects of vocabulary

Basically, before digging deeper in techniques to teach vocabulary, it is required to define clearly the matter of **what** to teach. Thus, what it means to “know a word” becomes another complicated issue.

Knowing a word involves knowing 1) a great deal about its general frequency of use, syntactic and situational limitation on its use, 2) its underlying form and forms that can be derived from it, 3) the network of its semantic features and 4) the various meanings associated with the item (Richards, 1976 cited in Ghazal, 2007).

MAJOR ASPECTS OF VOCABULARY

Categories		Description	Example
FORM	Pronunciation	What a word sounds like.	[ti:]
	Spelling	What a word look like.	t-e-a
Grammar		Change of forms	Sink → Sinking
ASPECTS OF MEANING	Collocation	Restriction or how words can be used together.	Make trouble but Do wrong
	Denotation	The core meaning that refers the word to the real world	Nightfall: the close of the day.
	Connotation	The additional meaning that shows people's emotions and attitudes towards what the word refers to.	<i>Excuse in She made an excuse for being late has a negative meaning.</i>
	Formality	Whether the word is appropriate to use in certain context.	Thank you vs. Thanks
	Synonym	Words that mean the same or nearly the same.	Bright, clever, smart → intelligent
	Antonym	Words that mean the opposite.	Rich vs. Poor
	Hyponym	Words that serve as specific examples of the same concept.	Bus, car, lorry, van → Transports
Word Building		How a word is created.	Ultra-modern, super-hero

Table 1: Major aspects of vocabulary (Adapted from Ur, 1996)

Table 1 is to describe the major aspects of vocabulary that can be taught to students by Ur (1996) adapted in *ELT Methodology II Course Book and Recommended Readings* (pp.81-87). Those divisions of vocabulary by Ur cover all aspects presented by other scholars.

Schmitt (1995: 86) also presented a list of the word knowledge types that native speakers typically possess, which should be achieved by the learners of English. As cited in Dastjerdi (2010), they are 1) a word's spoken form, 2) a word's written form, 3) a word's part of speech, derivative forms, and grammatical patterns, 4) a word's collocations, 5) how frequently a word is used in a language, 6) the many stylistic constrains which determine if a word is appropriate in a given context, 7) a word's conceptual meaning, 8) a word's semantic network of associations.

So, knowing a word is not just simply know its equivalent in one's mother tongue but there are a lot of aspects to cover. It is difficult for teachers to present new vocabulary and provide as many aspects as possible. Similarly, learners also encounter hardness to build up their own vocabulary with the sufficient perception of all aspects. But after all, the important in learning vocabulary is not knowing a word, but remembering it and then using it. In the next part, the explanation of how vocabulary is remembered is presented.

1.3. How vocabulary is remembered

Firstly, it should be noted that knowing a word does not mean that one can remember that word. According to Schmitt and Schmitt (1993:28 as cited in Tran, 2010), there are two types of mental processing involved in the task of vocabulary learning, they are discovering the meaning of a new word, and practicing and memorizing the "*discovered*" word. It means that from knowing a word to remembering it has a distance.

Secondly, in the end, the purpose of teaching vocabulary is of course, equipping learners with enough words for them to communicate successfully. If the work of teaching vocabulary only concerns how vocabulary is learned by students, it will be insufficient. How vocabulary is remembered by learners seems to be more difficult and necessary. To be more specific, knowing how learners remember words is not an easy task as each of them has their own set of ways to remember words. Moreover, it is essential in teaching vocabulary to know how it is learned. If teachers do not know the process of storing words in learners' mind, they will not be able to have positive impacts in need to help learners with words.

Thirdly, how vocabulary is learned and remembered are different but they are not perfectly distinctive. It can be reasoned that how word is learned has great influence on how it is remembered. For example, a good presentation of a word will help learners remember it more easily and use it more effectively as words are put in visualized presentation and in contexts (Do, 2009). In other words, visual aids are good to teach vocabulary as they can help enhance students' ability of remembering words after lessons.

In short, apart from knowing how word is learned, it is also important for teachers to know how word is remembered by their students so as to come up with better techniques to benefit vocabulary learning.

“The goal of memory is to leave you with a coherent story of what happened” (Reinitz, 2001 as cited in Hedge, 2010). Memory is a very complex psychological process and forgetting seems to be an inevitable process it. In vocabulary learning, almost all students have some times when they forget what they have learnt. And, recycling is vital to retain words in long-term memory. Besides, the way students was introduced

and the way they store the items learned can decide whether they succeed or fail in retrieving them when needed. However, most learners simply list the items learnt in chronological order, indicating their meanings with translation to the first language. This is far from helpful, because it prevents additions and refinements or indicates pronunciation (Moras, 2001). Moras also suggested that teachers can encourage learners to use other methods, using topics and categories to organize a notebook, binder, or index card. Diagrams and word trees can also be used within this topic/ category organization.

Coming back to the theory of memory system, human memory is a dynamic system, composed of three interconnected memory stores (Dr. Drew Appleby from Indiana University).

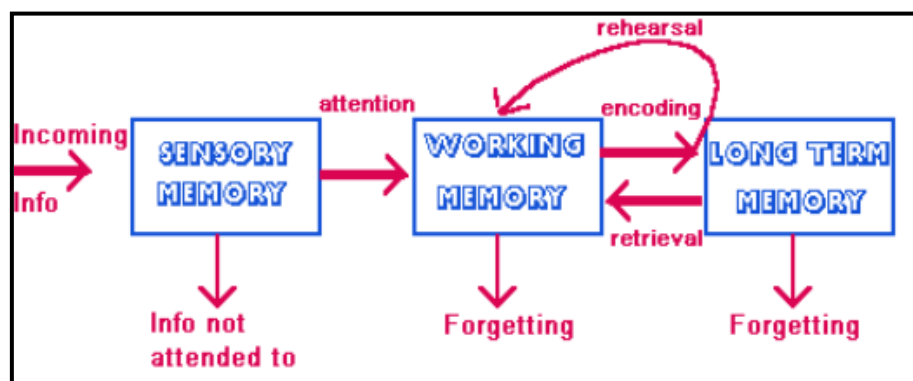


Figure 1: Human Memory System (Adapted from Hedge, 2010)

The diagram is to describe the operation of human memory system. The information received from our senses is initially stored in sensory memory or short-term memory. Although information is retained in sensory memory for less than two seconds, which is long enough for us to interpret it and to decide which parts of it are important enough to pay attention to and transfer to working memory, where we can continue to process it. The information only stays in working memory for about thirty seconds unless we continue to maintain them by repeating them to

ourselves. Forgetting occurs in working memory when there is too much information transferred from short-term memory into working memory.

Lastly, of course we wish to remember information more permanently, we need to bring them to our third and final memory store, known as long-term memory. Among many ways to improve memorizing ability and bringing words easily to the long-term memory, presenting new vocabulary well can really help.

1.4. Presenting new words

In lecture material named *Teaching Vocabulary_2010* by Vu Mai Trang (M.A.) – Lecturer of FELTE, techniques for presenting new words are highlighted. Among them, the technique of “*making vocabulary easy to remember by presenting them in memorable ways*” seems to be a challenging to teachers. What “memorable ways” are and how to create such ways are big questions for them. Scrivener (1994:90) suggested that it is also possible to integrate the teaching and the storing of vocabulary in a more direct way which enables students to record not only the words but also the way they learned the word. He illustrated his idea with a simple word spider map.

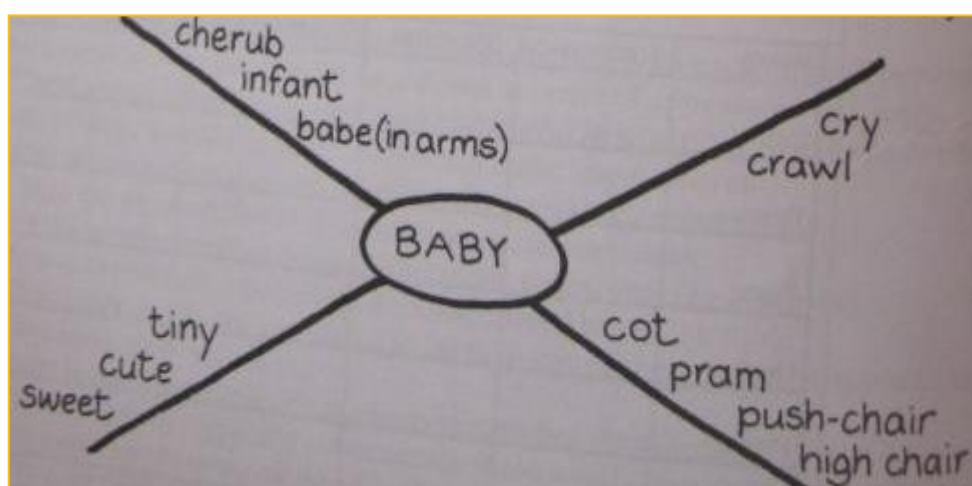


Figure 2: Word Spider (Scrivener, 1994)

Scrivener reasoned that the connections in meaning or use between different words are visually indicated in the diagram. Teachers are not required to be the providers of those kinds of word spiders all the times. Students should also be involved in producing the diagrams themselves so that the learning of new words and the recording of them are part of the same activity. Teachers should bear in mind that “memorable ways” are for students. Hence, involving learners is necessary when presenting words. In *How to teach vocabulary* (Thornbury, 2002), factors related to the presentation of new vocabulary are mentioned, including *sequence of presentation* and *means of presentation*. Translation, Realia, Actions/ Gesture, Pictures/ Illustrations, Definitions, Situations, Examples and Encounters are proposed. Mind maps and diagrams belong to the means of Pictures or Illustrations.

Presenting words is not only the introduction of new vocabulary to learners. Presenting can encourage the development of effective learning strategies for students (Hedge, 2000). According to Hedge, a helpful strategy for students to learn a language is to build up their own notebook, and to make a network of vocabulary associated with a particular item as shown in Figure 3 can be useful.

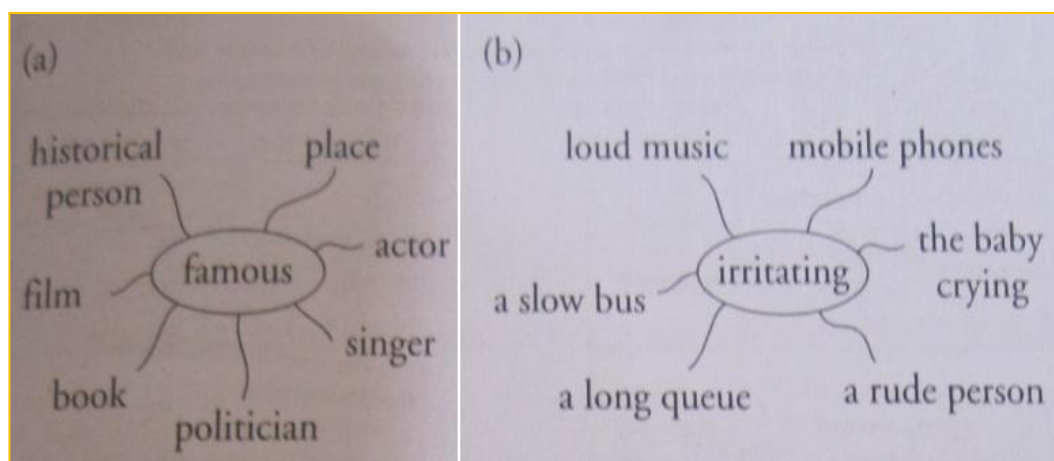


Figure 3: Word Networks (Hedge, 2000: 127)

2. Mind maps and diagrams

2.1. Mind mapping and diagrammatic techniques

According to Oxford Advanced Learners' Dictionary, a diagram is "a simple drawing using lines to explain where something is, how something works". It can be drawn from the definition that a diagram shows the relations between the parts or in other words, a diagram illustrates how things work and how they are constructed.

Lowe (1993) defined diagrams as specifically "*abstract graphic portrayals of the subject matter they represent*". Or in Hall's (1996) words "*diagrams are simplified figures, caricatures in a way, intended to convey essential meaning*". According to Jan V. White (1984), "*the characteristics of a good diagram are elegance, clarity, ease, pattern, simplicity, and validity*". Elegance here means that what you are seeing in the diagram is "*the simplest and most fitting solution to a problem*".

Diagrammatic technique is simply the way of using or applying diagrams in teaching and learning language to present the language items. And mind mapping techniques are the same as using mind maps and/ or diagrams belongs to visualizing techniques.

A mind map is a kind of diagram which shows the hierarchical relationship of ideas. Mind maps *are brainstorming diagrams based on a central idea or image [...]. Mind maps use a non-linear graphical form allowing the user to build an intuitive framework around the central idea* (Retrieved from <http://www.bestpricecomputers.co.uk/glossary/mind-mapping-software.htm>).

Mind mapping is a pattern which at least consists of pictures, symbols and colors. It is a concrete graphic illustration which indicates how a single concept is related to another concept in the same categories.

2.2. Classifications of mind maps and diagrams

There are many different types of diagrams from simple to complex. Anderson (1997) stated that "[...] maps, line graphs, bar charts, engineering blueprints, and architects' sketches are all examples of diagrams, [...]".

Introduced on <http://abitabout.com/Diagramming+technique>, these are the main diagram types, graph-based diagrams (net-work tree, Venn diagram, flow chart, existential graph, event chain ...), chart-like diagrams (bar chart, pie chart, function chart ...) and other types of diagrams (cycle concept map, spider concept map, train diagram...)

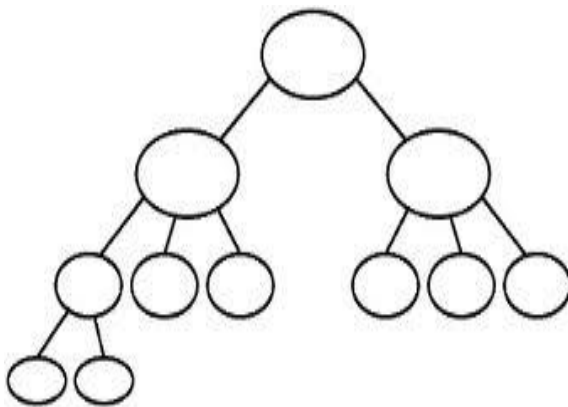


Figure 5: Network tree

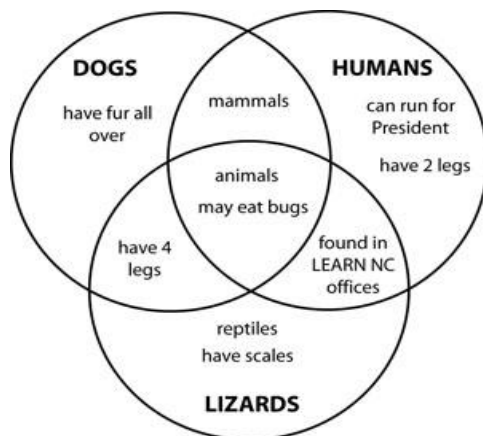


Figure 6: Venn diagram

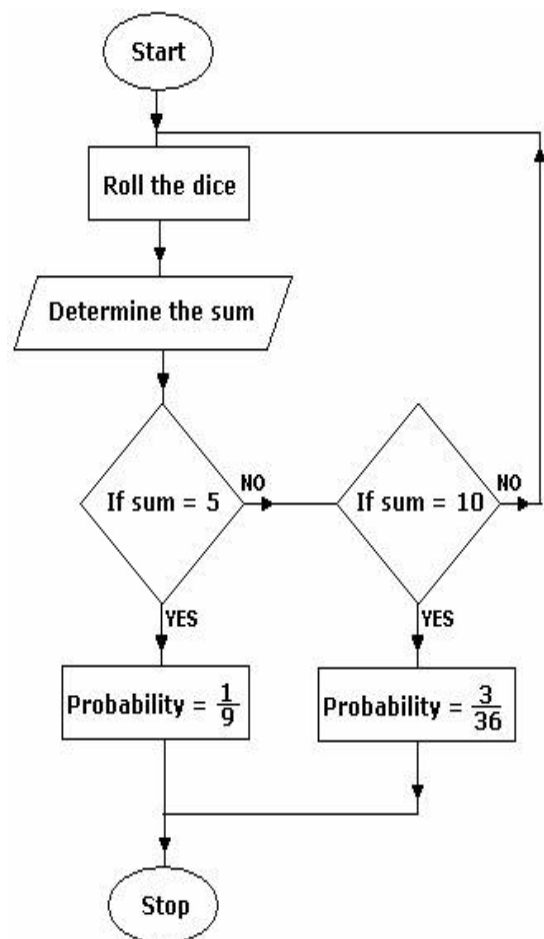


Figure 7: Flow chart

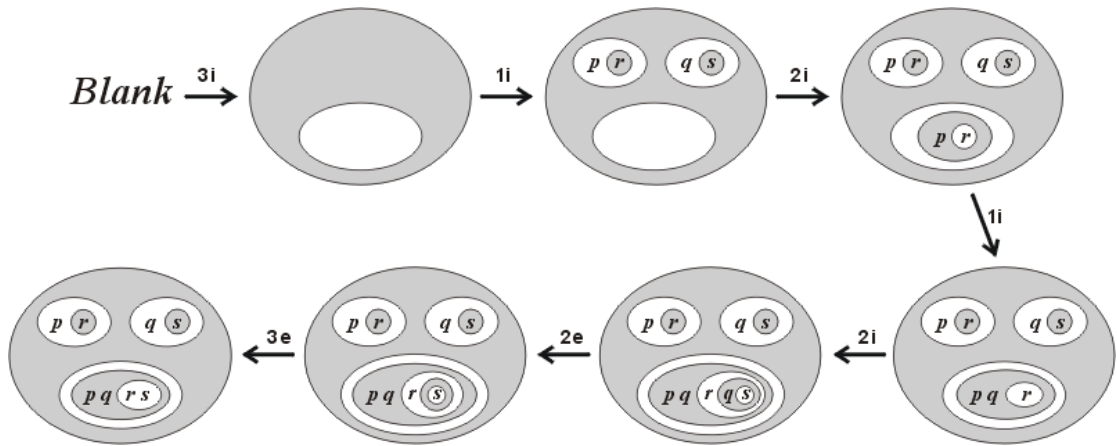


Figure 8: Existential graph

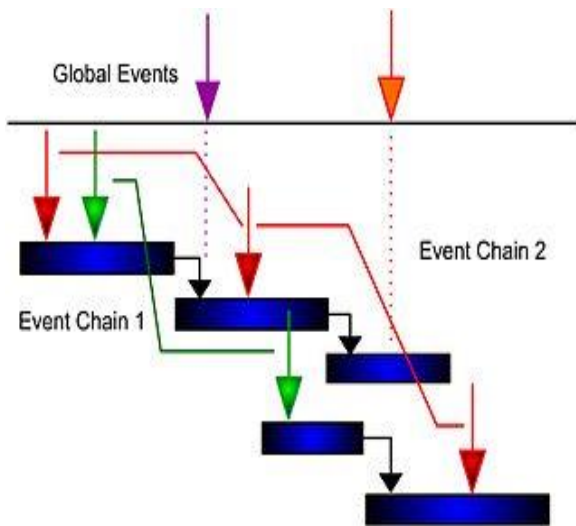


Figure 9: Event chain

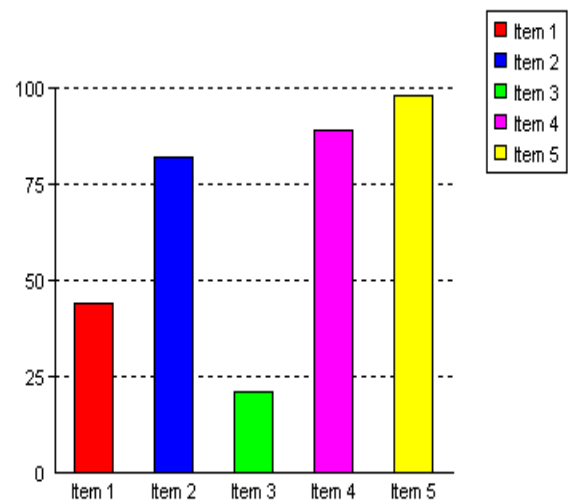


Figure 10: Bar chart



Figure 11: Pie chart

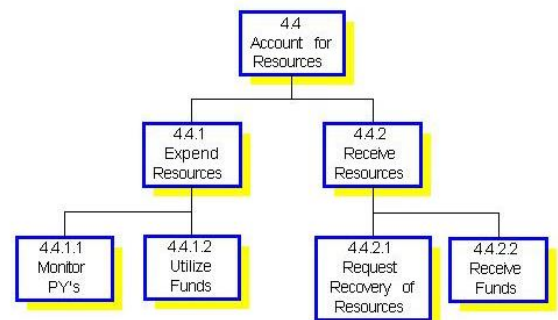


Figure 12: Function chart

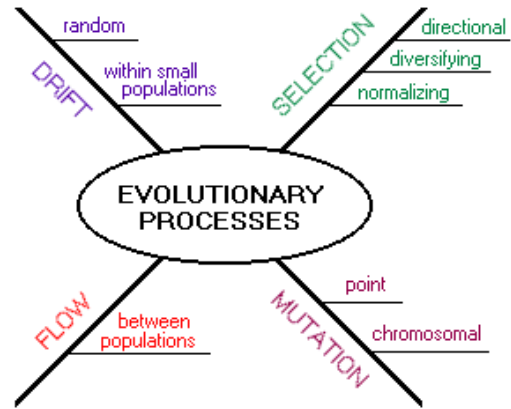
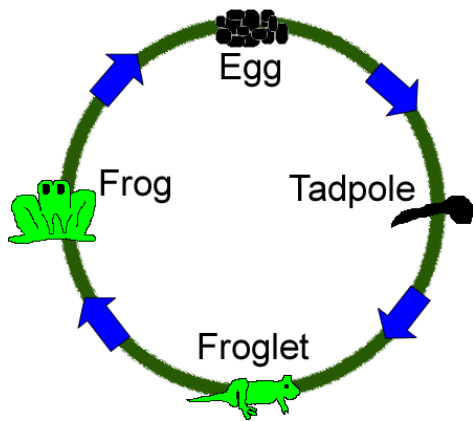


Figure 13: Cycle concept map

Figure 14: Spider concept map

Again, there are many types of diagrams. The choices of which to use and how to use need to be considered carefully by teachers. The choice of diagrams depends on the content of the language items to teach, the levels of the students' understandings and knowledge, the facility and preparation, etc.

Mind map, as stated above, is a type of diagram. However, unlike other types, mind map has its own striking features, including many criteria (as in Figure 4). Here are some examples of mind maps.

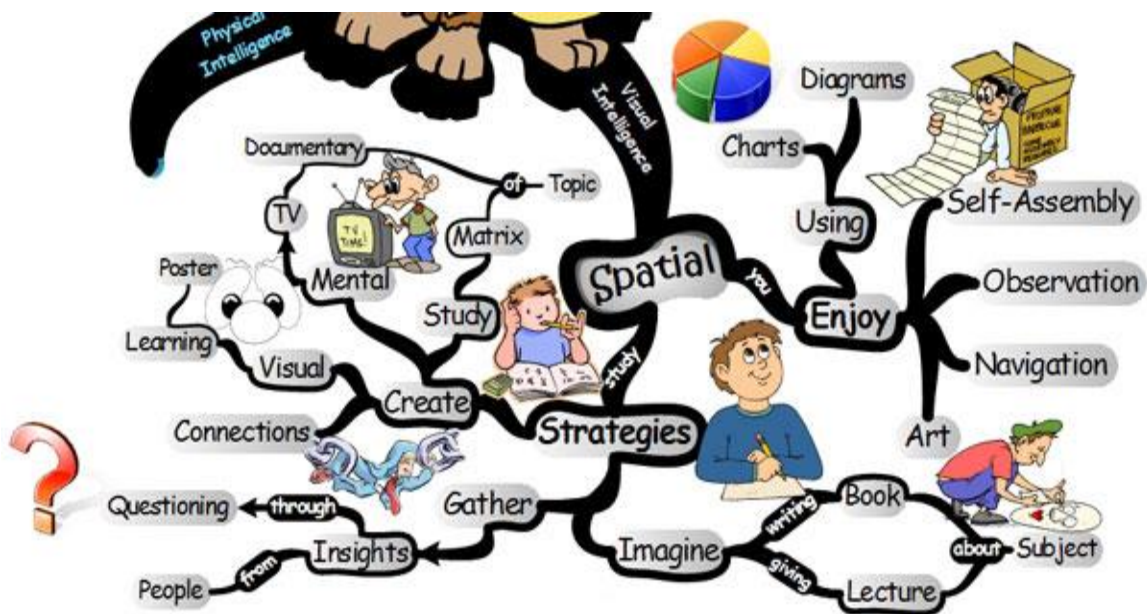


Figure 15: Mind map example 1 (Visual Intelligence)

2.3. Advantages of using mind mapping and diagrammatic techniques

Up till now, information is often recorded with letter, lines and numbers. With this way of noting down information, only a half of our brain, the left brain, is used. There has been no technique involving the right brain to process information while the right brain can help a lot when human process information with rhythm, color, space, and imagination.

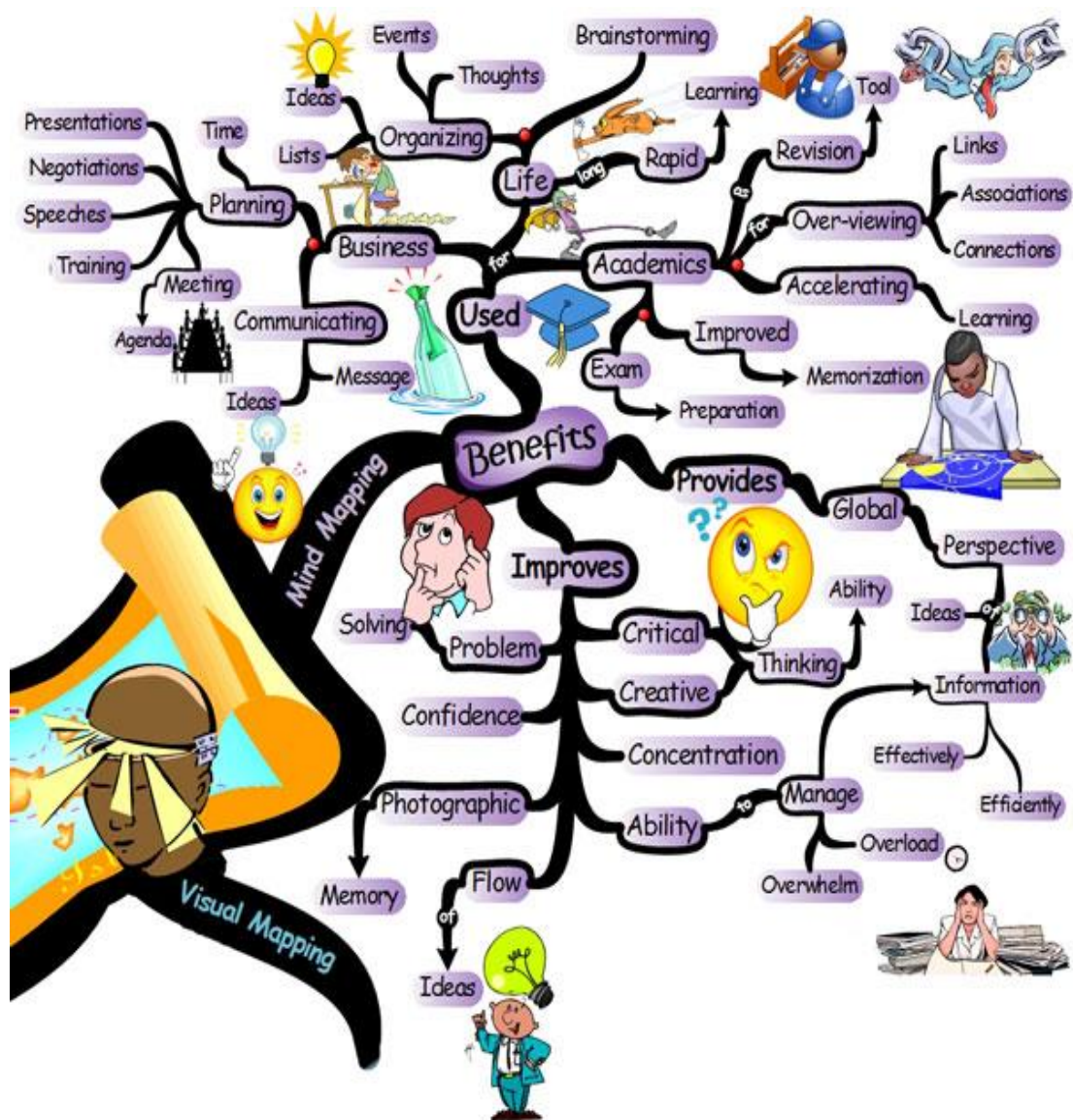


Figure 18: Benefits of Mind Mapping Technique

(Retrieved from <http://blog.iqmatrix.com/mind-map/7-intelligences-accelerated-learning-mind-map>)

Mind mapping is a creative note-taking method. With mind maps, it is easy to remember much information (De Porter, Readon and Nourie, 1999:175). This technique was introduced in the late 1960s by Tony Buzan as a way to help students note down the lecture. It was described to use only key words and pictures to make the ability of remembering better and the revision of knowledge much better. And Tony Buzan in his *Mind Map Book* (1993:1) states that mind mapping is a powerful graphic technique, which provides a universal key to unlock the potential of brain.

According to Windura (2008: 77-86 as cited in Effendi, 2004), each feature of mind mapping has its own benefits to the learners.

- ◇ **Central image:** A central image has to describe main idea of a mind map and put it on the central of the paper. It is for activating the students' right brain and strengthening the students' memory.
- ◇ **Key word:** A key word is a word that can lead a sentence or event. It is an urge to remember lots of words for students as they are only allowed to use one key word per line.
- ◇ **Basic ordering ideas:** Basic ordering ideas are the branches that collect information and they are all connected to the central topic. Making basic ordering ideas can direct your mind, encourage creativity and help students understand the material deeply.
- ◇ **Branches:** The branches should be curvy to encourage the activation of the right side of our brains.
- ◇ **Colors:** Color is a very good memory sign and it involves the right side of the brain as well. Colors encourage creativity and help in memorization in the long-term store. Colors bring life into the mind

map, which make it easier to comprehend and remember things presented on it.

- ◇ **Pictures:** In mind mapping, pictures can change and strengthen a key word that has been written before. On the other hand, pictures attract learners and help them remember things easily and vividly.

De Porter and Hernacki (2008:172) describe that there are some advantages using mind mapping technique. They are as follows.

- ◇ **Flexible:** Learners can put the label and category of something based on his own opinion anywhere in the mind maps.
- ◇ **Concentration on the topic:** All the subtopics focus on the main idea or key word, so learners can save time and stay focused.
- ◇ **Increasing comprehension:** Using mind map can make it easy to understand the material as learners can work out the connection or relation among parts of things.
- ◇ **Enjoyable:** Imagination and creativity are unlimited in using mind maps, so it can be more motivating to learn. By using pictures and colors, it makes the brain relaxed and excited to think.

From the above explanations, mind mapping is proved to bring a lot of benefits to the memorizing ability and brain development of learners.

Regarding diagrams, Mayoux (2003) stated that diagrams provide a universal language based on logical structures and relationships. Once the diagrams are learned and common symbols develop, they can communicate information across language barriers. Diagrams also contribute many advantages in teaching and learning vocabulary. First of all, diagrams can present concisely very complex information which

might take several pages to describe in words. Secondly, the simplicity and clarity of the diagram make it comprehensible to outsiders.

3. First year mainstream English majors, FELTE, ULIS, VNU

The target population of the current study is 485 first year mainstream English majors from Division I, FELTE, ULIS, divided into eighteen classes (eleven classes specialized in TESOL, six classes of Double Major degree and one class in English translation and interpretation). According the course outlines for these eighteen classes by Division I (for academic year 2010 – 2011), after their first year at university, their English proficiency should meet B1 level in the Global Common European Framework.

For ELT program (eleven classes of TESOL and one class of English translation and interpretation), students are expected to “get by with sufficient vocabulary to express him/ herself with some hesitation and circumlocutions on topics such as entertainment, media and communication, etc.” (English Division I) For Double Major program with six classes, beside language for daily communication, students do assumedly “have a sufficient range of language to describe unpredictable situations [...] on abstract or cultural topics as well as in business situation”.

The target students have ten credit hours in class (three for each of and Speaking or Writing, two for each of Reading and Listening). Furthermore, they also have to complete assignments, among all of which the most vocabulary-relating assignments are Vocabulary Sharing Activity for ELT program, Vocabulary Facilitation and Vocabulary Mini-tests for Double Major program.

In Vocabulary Sharing Activity, students in groups prepare to share with classmates no less than 10 important or interesting words or structures in their reading in Reading Focus. Their sharing includes providing the context, explaining the meaning and making sentences as example, designing several questions to check their peers' understanding and usage of the vocabulary items. Types and forms of questions are various and up to performers.

In Vocabulary Facilitation of fifteen to twenty minutes (for Double Major program), students check the Vocabulary Part for their friends. In addition, students have to design more exercises to help students in the class use that vocabulary effectively.

Vocabulary tests are designed to check students' self-study progress. Test items are in form of multiple choice questions (MCQs) and language items are taken from students' vocabulary exercises assigned in advance for each week.

So in fact, teachers have little time to 'really' teach vocabulary to students. And even vocabulary is stated as a goal in the course outlines, it is still integrated with skills.

4. Related studies

4.1. Review of related studies worldwide

Regarding the research matter of teaching vocabulary with mind maps and diagrams, the writer could only find one related study named "*Teaching vocabulary through mind mapping technique to the tenth grade students of SMA Negeri 15 Palembang*" by Yusuf Effendi (2004), a student of University PGRI, Indonesia. The research question of this thesis is "Is it effective to use mind mapping technique in teaching vocabulary to the tenth grade students of SMA Negeri 15 Palembang?"

There are some similarities and differences between this thesis and the writer's study. First of all, the similarity of these two is that they have the same independent variables and mind mapping techniques in Buzan's principles. Secondly, both used true-experimental research method. However, Yusuf's thesis based on Posttest Only Random Control Group Design, and this study based on the Pretest-Posttest Design. Therefore, the most distinctive difference is that in Yusuf's thesis, there was only one vocabulary test to test students before the treatment and after that. In this study, there were three vocabulary tests, including one pretest and two posttests. The reason for having three different tests is to ensure the reliability of the tests. The three tests had the same language items but different test items so that the vocabulary proficiency and learning progress of students were evaluated most exactly.

The writer also reviewed on some articles and writings on the World Wide Web about applying mind maps and diagrams in language teaching and learning, namely *Using mind maps to develop writing* by Vanessa Steele, British Council, Spain (retrieved on Monday, April 18th 2011 from

<http://www.englishonline.org.cn/en/teachers/workshops/teaching-writing/teaching-tips/mind-map>. The result was that mind maps and diagrams were used to teach Reading, Writing and Critical Thinking. However, there was no article or research on using mind maps and diagrams to teach vocabulary.

4.2. Review of related studies in Vietnam

The writer also did try to review on the literature of the research problem from the resources in the university library. There are a variety of studies on the matter of teaching and learning vocabulary, namely "*Using movies and videos to teach English vocabulary to the tenth form*

students” written by Do Thi Lan Anh (2010), “*Techniques in teaching vocabulary to young learners at ILA school*” submitted by Nguyen Thi Kim Chi (2010), “*Vocabulary level and vocabulary learning strategies of first year ULIS mainstream English majors*” conducted by Ngo Xuan Minh (2009), etc.

As conveyed from the titles of those studies, there are no closely-related studies to “*using mind maps and diagrams to teach vocabulary for first year mainstream students*”. However, those studies helped the writer a lot in building up the reviewed literature on Vocabulary and Vocabulary teaching and learning.

4.3. Literature gaps

From the look back on previous studies related to the research problems, the writer found that there are not many references on the topic of *using mind maps and diagrams to teach vocabulary*.

Also, vocabulary is one of the most important aims for first year mainstream students to obtain as stated in the Course Outlines (Division I, 2010 – 2011). However, there has been no research related to vocabulary teaching techniques. To address this gap, the writer carried out this study on the first year mainstream students as the target population.

Summary

This chapter has dealt with the theoretical background for the whole study with firstly the basic knowledge of English vocabulary, and secondly mind maps and diagrams in teaching vocabulary. Besides, this chapter also defines the target population of the study, who are the first year mainstream students at FELTE, ULIS. Last but not least, the related studies worldwide and in Vietnam are reviewed.

CHAPTER III: METHODOLOGY

The following chapter describes in details the methodology applied in conducting this paper, including (1) methods of the research, (2) population and sampling, (3) data collection instruments, (4) data collection procedures and (5) data analysis procedures.

1. Method of the research

To address the first research question, quantitative method (questionnaires for students at Division I) was used. For the second question, both qualitative (semi-structured interviews with students) and true-experimental methods were applied.

The experimental would be in the Pretest-posttest designs, which are widely used for the purpose of comparing groups and/or measuring changes resulting from experimental treatment (Dimiter and Rumrill, 2003). The basic pretest-posttest experimental designs are designed in which one or more experimental groups are exposed to a treatment or intervention and then compared to one or more control groups, who did not receive the treatment.

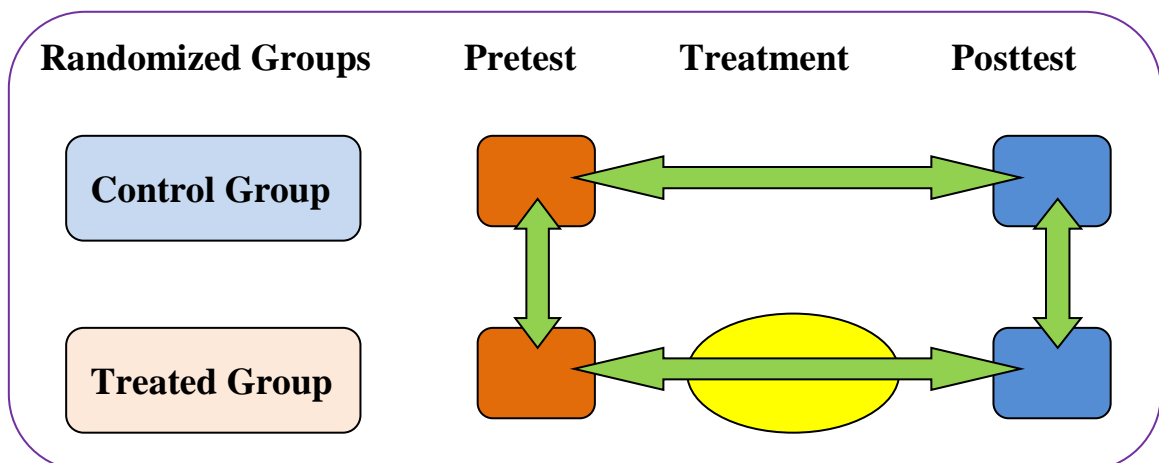


Figure 19: Illustration of Pretest-posttest Designs

(Adapted from <http://www.experiment-resources.com/pretest-posttest-designs.html>)

Statistic analysis can then determine if the intervention had a significant effect (Accessed on April 18, 201 on <http://www.experiment-resources.com/pretest-posttest-designs.html>).

The design is as follows:

Experimental group:	R	M	X₁	O₁	O₂
Control group:	R	M	X₂	O₁	O₂

In which,

R: Randomization

M: Matching process through a pretest

X₁: Teaching through mind maps and diagrams

X₂: Teaching without mind maps and diagrams

O₁: Posttest 1

O₂: Posttest 2

In order to conduct this research, the writer would randomly select students from Division I then place the chosen students into two groups (experimental group and control group).

After the try-out of the vocabulary tests, the writer would give the test to match students from these two groups. Then, a thirty minute vocabulary lesson with mind mapping and diagrammatic techniques would be given to the experimental group and a lesson without mind maps and diagrams would be given to the control group. Next, posttests would be given to both groups right after the lesson, and three weeks later. Data collection was processed through these tests.

In this research, there are two kinds of variables, independent variables and dependent variables. Independent variable is mind mapping and diagrammatic techniques that are provided to the students, and dependent variable is the students' scores in the vocabulary tests.

2. Population and Sampling

The participants of this study were first year mainstream students at Division I, FELTE of their second semester in the academic year 2010 – 2011. 100 students were involved in the survey questionnaires and 30 of them would take part in the trail lessons and tests.

According to Admed (2009), in cluster sampling, cluster – a group of population elements constitutes the sampling unit, instead of a single element of the population.

In the conduction of this study, two-stage random sampling was applied through the cluster random sampling and the individual random sampling. There would be two groups chosen through the cluster random sampling. After gathering students in two groups, the writer did the individual random sampling by giving a pretest to the students from the two groups as pretested and then matched them based on their similar scores. Here is the sampling of the study.

THE SAMPLE OF THE STUDY

No.	Group	Number of students	Number of matched pairs
1	X ₁ (Experimental)	15	15
2	X ₂ (Control)	15	
Total		30	

Table 2: The sample of the study

3. Data collection instruments

3.1. Questionnaires

Questionnaire is a useful tool in educational research since “individuals can complete them without any direct assistance or intervention from the researchers” (Salkind, 2003). As questionnaires save time and efforts for both researchers and participants, in this research, questionnaires for students and teachers were employed as one of the primary instruments for data collection.

By delivering the questionnaires for students of Division I, the writer focused on answering the first research questions: “*To what extent mind maps and diagrams are currently used to teach vocabulary for first year mainstream students at Division I?*” Questionnaires for students (see Appendix 1) were translated in Vietnamese so that students would easily follow and complete.

3.2. Vocabulary Tests

In collecting data, the writer used written tests to know the students’ ability in leaning and remembering vocabulary. There were three vocabulary tests in total, used as a pretest and two posttests to measure the students’ vocabulary when using mind maps and diagrams to teach. The tests were in the forms of multiple choice questions, matching and gap filling with 20 test items and the time allowance was 15 minutes for each test. The three tests were the same for the two groups.

Regarding the test, the writer did concern about the *validity and reliability* of the test. **Validity** is the ability of the test to measure what it is purposed to measure. In other words, validity refers to the accuracy of an assessment. In order to make the test have high validity, the writer only used concrete test items. The validity of the test material in this

study would be checked through the content validity. It is a type of validity which is concerned with a test's ability to include or represent all of the content of a particular construct (Research Methods, Allpsych online). The test was valid as the content could measure the students' ability in vocabulary.

TEST DESCRIPTION

Objectives	Test students' ability at using the words in the theme "Natural World" (Animals)
Materials	Words that involved in the theme "Natural World" (<i>Amphibian, bird, fish, reptile, mammal, insect, frog, toad, salamander, seagull, nightingale, swan, seahorse, whale shark, salmon, turtle, crocodile, snake, pig, tiger, dolphin, butterfly, grasshopper, bee, domain, kingdom, phylum, class, order, family, genus, species, Chordata, Mollusca, Arthropoda</i>)
Indicators	Students are able to distinguish different types of animals in Kingdom Animalia. Students are able to remember the biological classifications.
Test items	20
Test Types	Multiple choice questions (MCQs) Matching & Gap filling

Table 3: Vocabulary Test Description

Reliability is the consistency of your measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. In short, it is the repeatability of your measurement. In order to estimate the reliability of the test, the writer applied **Kuder-Richarson Formula 21** (Lenke, 1977) to provide a rough approximation of inter-item consistency. A higher Kuder-Richarson 21 value indicates a strong relationship between items on the test. A lower value indicates a weaker relationship between test items. A lower value indicates a weaker relationship between test items. This value is calculated using the following formula.

$$KR-21 = \frac{K}{K-1} \left[1 - \frac{M(K-M)}{K(SD)^2} \right]$$

In which:

- KR-21: Kuder-Richardson Reliability Coefficient
- K: Number of items in the test
- M: Mean of the set of the test scores
- SD: Standard Deviation of the set of the test scores

The formula of Standard Deviation is as follows:

$$SD = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

In which,

- X: The students' total scores
- N: The number of students

Assessment Handbook – A guide for developing assessment programs in Illinois Schools (1995) retrieved on Saturday, March 26, 2011 from http://www.gower.k12.il.us/Staff/ASSESS/1b_fwd.htm#Foreword

**THE STUDENTS' SCORES AND THE RELIABILITY
COEFFICIENT OF THE TEST ITEMS IN PRETEST**

Student	Number of items	Number of students' correct answers (X)	Mean (\bar{X})	(X - \bar{X})	(X - \bar{X})²
C1	20	4	9.1	-5.1	26.01
C2	20	10	9.1	0.9	0.81
C3	20	10	9.1	0.9	0.81
C4	20	11	9.1	1.9	3.61
C5	20	16	9.1	6.9	47.61
C6	20	6	9.1	-3.1	9.61
C7	20	9	9.1	-0.1	0.01
C8	20	11	9.1	1.9	3.61
C9	20	12	9.1	2.9	8.41
C10	20	4	9.1	-5.1	26.01
C11	20	7	9.1	-2.1	4.41
C12	20	5	9.1	-4.1	16.81
C13	20	8	9.1	-1.1	1.21
C14	20	5	9.1	-4.1	16.81
C15	20	18	9.1	8.9	79.21
E1	20	13	9.1	3.9	15.21
E2	20	9	9.1	-0.1	0.01
E3	20	6	9.1	-3.1	9.61
E4	20	10	9.1	0.9	0.81
E5	20	12	9.1	2.9	8.41
E6	20	18	9.1	8.9	79.21
E7	20	10	9.1	0.9	0.81
E8	20	5	9.1	-4.1	16.81

E9	20	16	9.1	6.9	47.61
E10	20	5	9.1	-4.1	16.81
E11	20	7	9.1	-2.1	4.41
E12	20	8	9.1	-1.1	1.21
E13	20	4	9.1	-5.1	26.01
E14	20	3	9.1	-6.1	37.21
E15	20	11	9.1	1.9	3.61
	Σ	273			521.7

Table 4: Students' scores and the reliability coefficient of the test items in Vocabulary Pretest

$$M = \frac{\sum X}{N} = \frac{273}{30} = 9.1$$

$$SD = \sqrt{\frac{\sum(X-\bar{X})^2}{N}} = \sqrt{\frac{521.7}{30}} = 4.134005$$

$$\begin{aligned} KR-21 &= \frac{K}{K-1} \left(1 - \frac{M(K-M)}{K.SD^2} \right) \\ &= \frac{20}{19} \left(1 - \frac{9.1(20-9.1)}{20(4.134005)^2} \right) = 0.747159 \end{aligned}$$

$$\rightarrow KR-21(\text{Pretest}) = \mathbf{0.747159}$$

In the table of *Students' scores and the reliability coefficient of the test items in the Pretest*, names of students are coded as C + number or E + number. C means Control, E means Experimental. That was the same with the table 5. That means student E1 in table 4 was exactly the same person to student E1 in table 15 and 16.

**THE STUDENTS' SCORES AND THE RELIABILITY
COEFFICIENT OF THE TEST ITEMS IN POSTTEST 2**

Student	Number of items	Number of students' correct answers (X)	Mean (\bar{X})	(X - \bar{X})	(X - \bar{X})²
C1	20	5	10.5	-5.5	30.25
C2	20	11	10.5	0.5	0.25
C3	20	7	10.5	-3.5	12.25
C4	20	6	10.5	-4.5	20.25
C5	20	4	10.5	-6.5	42.25
C6	20	13	10.5	2.5	6.25
C7	20	14	10.5	3.5	12.25
C8	20	6	10.5	-4.5	20.25
C9	20	11	10.5	0.5	0.25
C10	20	5	10.5	-5.5	30.25
C11	20	17	10.5	6.5	42.25
C12	20	5	10.5	-5.5	30.25
C13	20	8	10.5	-2.5	6.25
C14	20	13	10.5	2.5	6.25
C15	20	9	10.5	-1.5	2.25
E1	20	15	10.5	4.5	20.25
E2	20	14	10.5	3.5	12.25
E3	20	12	10.5	1.5	2.25
E4	20	5	10.5	-5.5	30.25
E5	20	11	10.5	0.5	0.25
E6	20	16	10.5	5.5	30.25
E7	20	15	10.5	4.5	20.25
E8	20	7	10.5	-3.5	12.25

E9	20	15	10.5	4.5	20.25
E10	20	13	10.5	2.5	6.25
E11	20	13	10.5	2.5	6.25
E12	20	12	10.5	1.5	2.25
E13	20	8	10.5	-2.5	6.25
E14	20	8	10.5	-2.5	6.25
E15	20	17	10.5	6.5	42.25
	Σ	315			479.5

Table 5: Students' scores and the reliability coefficient of the test items in Vocabulary Posttest 2

$$M = \frac{\Sigma X}{N} = \frac{315}{30} = 10.5$$

$$SD = \sqrt{\frac{\Sigma(X - \bar{X})^2}{N}} = \sqrt{\frac{479.5}{30}} = 3.9979161$$

$$\begin{aligned}
 KR-21 &= \frac{K}{K-1} \left(1 - \frac{M(K-M)}{K \cdot SD^2} \right) \\
 &= \frac{20}{19} \left(1 - \frac{10.5(20-10.5)}{20(3.9979161)^2} \right) = 0.7241664
 \end{aligned}$$

$$\rightarrow KR-21(\text{Posttest 2}) = \mathbf{0.7241664}$$

Fraenkel and Wallen (1990:36), as cited in Effendi (2004), wrote that for research purposes, a useful rule is that reliability should be at least 0.70 and preferably higher. From the calculation, KR-21(Prestest) was **0.747159**, which was higher than **0.70** and KR-21(Posttest) was **0.7241664** which was also higher than **0.70**. This means that that the pretest and the second posttest are valid and reliable.

The first posttest is taken right after the lessons when students have the best memory of what they have been taught so the reliability of posttest 1 cannot be as high as the pretest or the posttest.

3.3. Interviews

Interviews were conducted with the experimental group after their trial lesson (the one with mind maps and diagrams). Salkind (2003) also stated that interviews help researchers “get better response and more accurate data”. Therefore, to enhance the reliability of the study, informal interviews were planned to be taken between the research writer and the participants of the experimental group. Semi-structured interviews (see Appendix 3) aimed at students’ reflection on their studying with mind mapping including the difficulties, advantages, and suggestions. During the interviews, detailed notes were taken. The interviews were carried in both Vietnamese and English, depending on the convenience and interest of interviewees.

4. Data collection procedures

Data collections procedures of the study had three phases. This whole procedure of collecting data can be imagined as in Figure 20

4.1. Phase 1

At this phase, all the necessary materials were prepared, consisting of questionnaire, lesson plans for control and experimental groups, vocabulary tests, and semi-structured interview questions. Also, in the first phase, the try-outs of questionnaires and vocabulary tests were carried out.

Preparing lesson plans for each group was the most time-consuming task in this phase. There were two different lesson plans designed for the study.

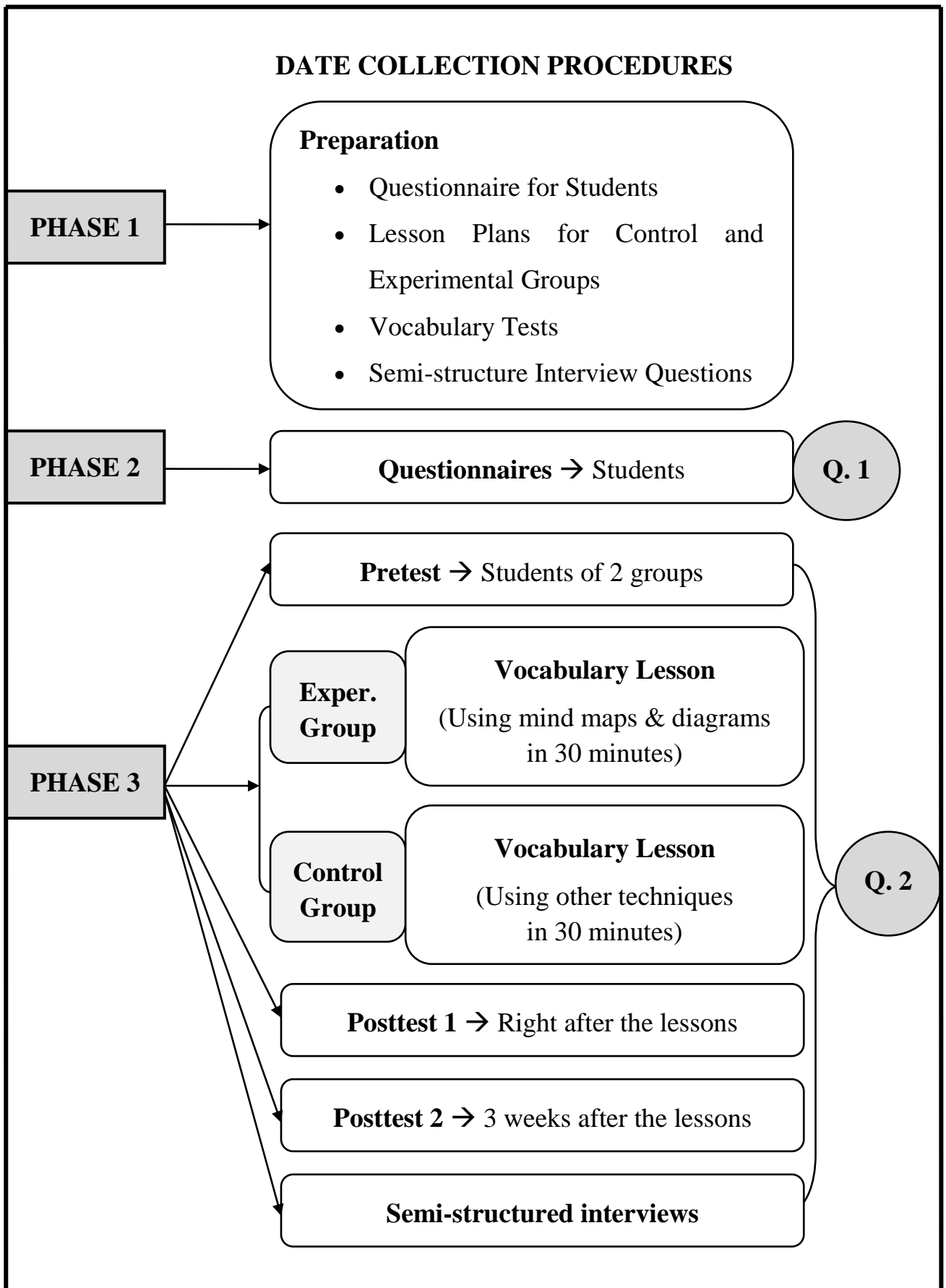


Figure 20: Data collection procedures

First of all, *class description, time allowance, objectives, assumed knowledge, anticipated problems* were the same between two lesson plans. (See appendix 3 and 4 for the full version of lesson plans). Among those components of a lesson plan, objectives were the most important one because they would be related to the aims of the tests later on.

After the lesson, students are able to know the meanings and use the words in the theme of **Natural World**. (Topic: **Animals**)

List of the words: *Amphibian, bird, fish, reptile, mammal, insect, frog, toad, salamander, seagull, nightingale, swan, seahorse, whale shark, salmon, turtle, crocodile, snake, pig, tiger, dolphin, butterfly, grasshopper, bee, domain, kingdom, phylum, class, order, family, genus, species, Chordata, Mollusca, Arthropoda.*

Lesson Plan's Objectives

The teaching procedures and the materials prepared for each group were also bound in the lesson plans.

4.2. Phase 2

The second phase of the study aims at answering the first research question. To achieve this goal, 100 survey questionnaires were delivered to mainstream students of Division I. The survey questionnaires were in Vietnamese and one-page long, which were convenient for the students to complete them.

4.3. Phase 3

This is the most important phase of the whole study as it aims to answer the second research question. Firstly, the writer chose randomly 30 students to form two groups, control group and experimental group.

These two groups took the pretest together. After that, each of them would experience different vocabulary lessons. The objectives of the two lessons were identical or in other words, the word items to be taught for each group were the same. However, the treatments for each group in terms of method were different. Experimental group would learn with the application of mind maps and diagrams, whereas control group would learn with other techniques, namely, pictures, game and word puzzle. Right after the lessons, students of both groups took the first posttest to evaluate their memory of the language items taught in the thirty minute lessons. Three weeks later, another posttest was delivered to students of the two groups. This second posttest was to check the memory of students after a period of time from the lessons.

Students of experimental group also took part in a semi-structured group interview. The writer did not interview student by student as it was quite difficult for to make the appointment with students and to have enough time to conduct many interviews like that. Instead, the whole group was interviewed with the same question and the students' freedom of speech. The interviews were recorded for the writer's later review with the approval of interviewees. When all the data were collected, data analysis would be processed in order to find solutions for the two research questions.

5. Data analysis procedures

5.1. Questionnaire analysis

This was the very first step in data analysis procedure. The response of students to the questions were counted, rated in percentage then synthesized and presented in form of charts and tables to illustrate more clearly the current situation of using mind maps and diagrams to teach vocabulary for first year mainstream students.

5.2. Test result analysis

Pretest was given to students of the two groups. Basing on the result of the test, the writer matched students from two groups in pairs. Basing on the results of the two posttests, the writer analyzed through three steps, namely (1) individual scores, (2) conversion of percentage range and (3) matched t-test.

5.2.1. Individual Scores

The formula is used to know the individual score:

$$X = \frac{R}{N} \times 100$$

Where

X: Result of English Vocabulary Scores

R: The total number of correct answers

N: The total number of test items

5.2.2. Conversion of Percentage Ranges

Percentage Ranges	Qualification
90 – 100	Excellent
70 – 89	Good
55 – 69	Enough
40 – 54	Poor
0 - 39	Very poor

Table 6: Conversion of Percentage Ranges

5.2.3. Matched t-test

Matched-pairs t-test is used to test whether there is a significant mean difference between two sets of paired data. Here is the formula of matched t-test (Hatch and Farhady, 1982:116)

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}}$$

$$S_{\bar{D}} = \frac{SD}{\sqrt{n}} \quad SD = \sqrt{\frac{\sum D^2 - \left(\frac{1}{n}\right)(\sum D)^2}{n-1}}$$

Also from **Hypothesis Testing: Continuous Variables** (Last viewed on March 26, 2011 on <http://www.uwsp.edu/psych/stat/11/hyptest2s.htm#IV2>)

In which,

t: Matched t-test

X_1 : The mean of Experimental group in the posttest

X_2 : The mean of Control group in the posttest

$S_{\bar{D}}$: Standard Error of difference between two means

SD: The standard deviation

n: The number of matched pairs

Decision Rules of Matched-pairs t-test is available on Psychological Statistics (<http://www.uwsp.edu>). The t-value will be possible if the first mean (X_1) is larger than the second and negative if it is smaller.

To test the significance, it is necessary to set a risk level (called the alpha level). In most social research, the “rule of thumb” is to set the alpha (α) level at **0.05**. This means that five times out of a hundred you would find a statistically significant difference between the means even there was none.

Degree of freedom (df) also needs to be determined. Degree of freedom is the sum of the person in both groups. In the type of Dependent Group Design, we have $df = n - 1$ (with n is the number of pairs). In this study, there were 15 matched pairs, so $df = 15 - 1 = 14$.

The standard table of significance with given alpha level and the degree of freedom (df) shows us the **t-table**. It is the critical value that helps us determine whether the matched t-test (or the **t-obtained**). According to the table of critical value, **t-table** of this study is **2.145**.

CRITICAL VALUES t-table

df	1	...	9	10	11	12	13	14	15
$\alpha = 0.05$	12.706	...	2.262	2.228	2.201	2.179	2.160	2.145	2.131

Table 7: Critical Values t-table

(According to *Psychological Statistics* accessed on April 21, 2011 from <http://www.uwsp.edu/psych/stat/t.htm>)

There are two hypotheses in this study. They are Null Hypothesis and Alternative Hypothesis. What each hypothesis means can be showed in this table.

Symbols	In words
Null Hypothesis (H_0)	Using mind maps and diagrams to teach vocabulary for first year mainstream student is not effective .
Alternative Hypothesis (H_A)	Using mind maps and diagrams to teach vocabulary for first year mainstream student is effective .

Table 8: Hypotheses

The two hypotheses above are for the second research question (*Do using mind maps and diagrams work to teach vocabulary for first year mainstream students at Division I?*) And here is the Decision Rule.

Conditions	Results
t-obtained > t-table (matched t-test > 2.145)	Reject H₀ → Using mind maps and diagrams to teach vocabulary for first year mainstream student is effective .
t-obtained < t-table (matched t-test < 2.145)	Do not reject H₀ → Using mind maps and diagrams to teach vocabulary for first year mainstream student is not effective .

Table 9: Decision Rules

5.3. Interview Analysis

In terms of semi-structured interviews, answers from interviewees were collected and analyzed. There are four questions in the interview. Answers should be in forms of short answers.

Beside the results of tests, interview result was a channel to know about students' opinions about mind mapping and diagrammatic techniques in teaching vocabulary. There could be tables or diagrams for the analyzing of the interview. Quotations and summaries were used to provide the exact interpretations of students' responses.

Summary

Throughout this chapter, the methodology of the paper, which is a combination of qualitative and quantitative methods, has been presented. Methodology Chapter includes the method of the study, population and sampling method (randomization). Succeeding the participant section is the description of data collection instruments and procedures as well as data analysis procedures.

CHAPTER IV: FINDINGS AND DISCUSSION

In this chapter, the writer presents the main findings of the study. All the collected data from the test papers, interviews and questionnaires will be analyzed and discussed to provide answers to the two research questions.

1. Research question 1: “To what extent, mind maps and diagrams are currently used to teach vocabulary for first year mainstream students at Division I?”

Of the three phases of data collection procedures, the second was to deal with the first research question, in which the survey questionnaire was designed, based on students’ perspectives with six questions.

1.1. Techniques applied to teach vocabulary by teachers at Division I

In the first question, students were asked “*Which techniques have your teachers often used to teach vocabulary?*”

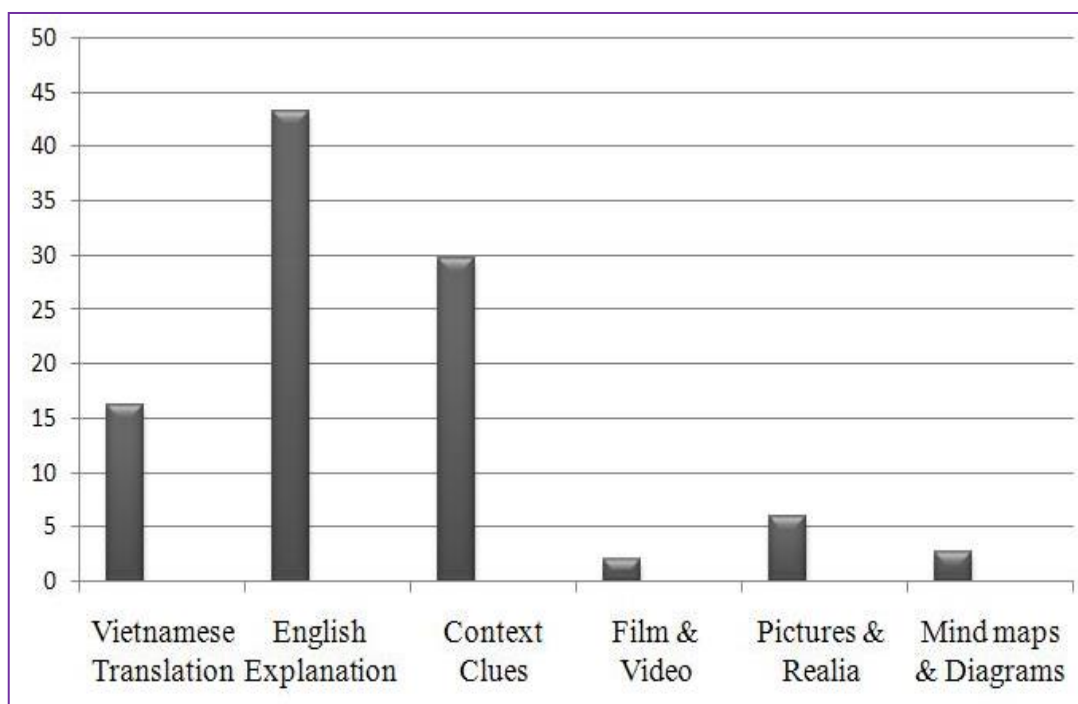


Figure 21: Techniques applied to teach vocabulary

As it can be seen from the chart, there are some techniques listed for suggestions when students review on the techniques their teachers have used to teach vocabulary. Among the six techniques here, English Explanation is the most favored. The next is Context Clues and the least used technique is using films and videos maybe due to the lack of facilities in the classroom. Regarding the focus of the study – mind mapping and diagrammatic techniques, from the students’ answer, it can be withdrawn that mind maps and diagrams have been used. It makes up for 2.7% of the total answers in the question. Mind mapping and diagrammatic technique ranks the second of the least used techniques, after Films and Videos. Despite their small portion of usage frequency, but at least, as the writer expected, mind maps and diagrams have been used to teach vocabulary at Division I. This result proved that teachers at Division I knew about mind maps and diagrams and applied them to teach vocabulary. And, some of the students (4 out of 100 questionnaire takers) could realize the technique.

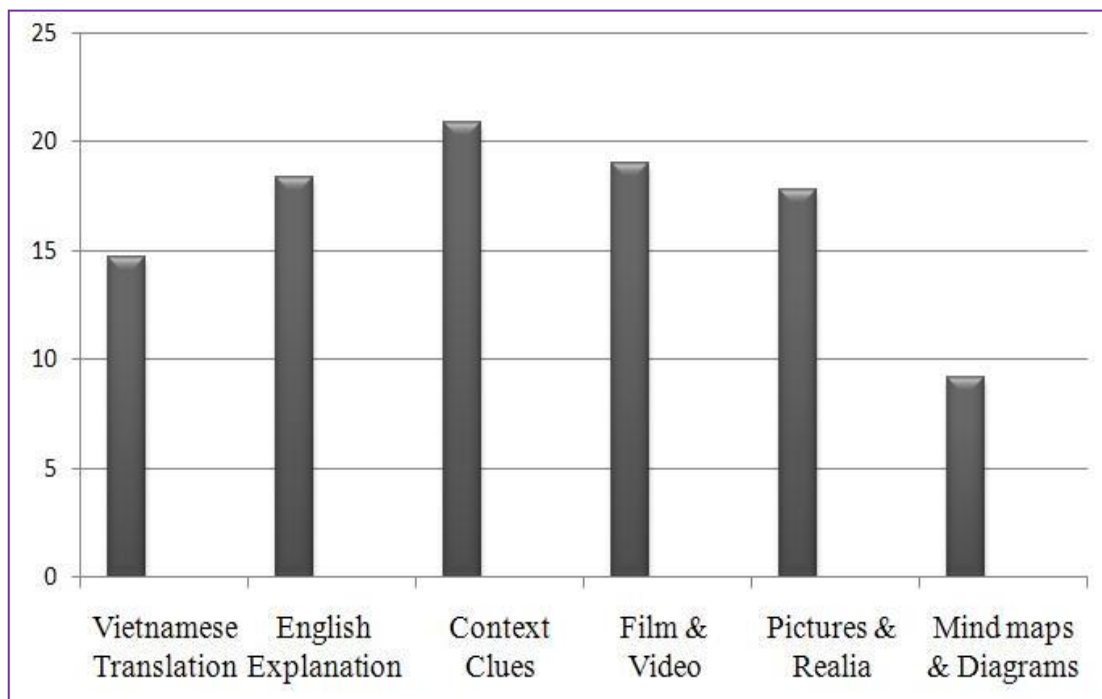


Figure 22: Vocabulary Teaching Techniques favored by students

In the second question, students had chance to express their favor to techniques of vocabulary teaching. Unlike writer's expectation, using mind maps and diagrams gains only 9.2% of students' preference. That did not discourage the writer from conducting the study. As from the first question, using mind maps and diagrams was quite rare in teaching vocabulary. And the writer' subjective reason for the result is that because students have not had lots of chance to work with mind mapping and diagrammatic techniques, therefore they might not recognize the advantages of the techniques.

After analyzing this question, the writer thought of a question in the semi-structured interview to know whether after learning with mind maps and diagrams, students' attitude towards the techniques would change or not. The question is "*Do you want to learn vocabulary with mind maps and diagrams?*" The answer from all students of experimental group was a "big" YES. They reasoned that they remembered words better and longer with the illustration of mind maps and diagrams in the lesson. Moreover, they found the learning more exciting and interesting.

1.2. The knowledge about mind mapping and diagrammatic techniques

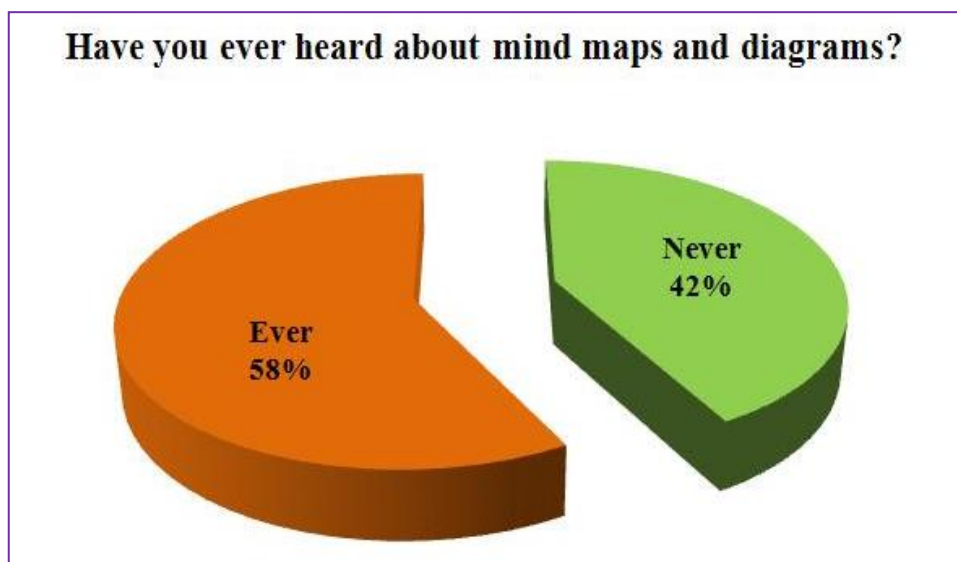


Figure 23: Students' knowing of mind maps and diagrams

In the two next questions in the questionnaire, 100 participants were checked about their knowing of mind mapping and diagrammatic techniques. Question 3 was “*Have you ever heard about mind maps and diagrams?*” and 58% of the answer was EVER (See Figure 23).

The fourth question of the questionnaire survey was for those whose answer was EVER. They were expected to give details about the sources from which they have known about mind maps and diagrams. And the most common resources were from friends’ introduction, books and magazines, the Internet, a scientific conference, a film, and teachers. For many students, they just knew about mind maps and diagrams quite accidentally without any intentions of digging deeper in the use of the methods or applying in their learning sometimes. For example, very coincidentally, when watching an American film (Students did not remember the exact name of the film at the time of answering the questionnaire), the answerer remembered the scene in the film when a character, a teacher used mind maps to teach her students. Their knowing from many sources may not be systematic and without educational purposes.

The most interesting source was “teachers”. Participants were required to make it clear in which lessons or skills their teachers did apply mind maps and diagrams. The students listed Study Skills lessons, Reading, Writing and Speaking Skills as examples. Therefore, to some extent, mind maps and diagrams have existed in lessons for first year mainstream students. The application would be varied from teacher to teacher and from lesson to lesson. The writer really wanted to have a more detailed investigation on the application in those subjects and skills. However, as the time was not advantageous and the study just focused on using mind maps and diagrams to teach vocabulary.

1.3. Using mind maps and diagrams to teach vocabulary

Questions 5 and 6 related to vocabulary teaching with mind maps and diagrams. Question 5 was “*Have you ever been taught vocabulary through mind maps and diagrams?*” Here was the result.

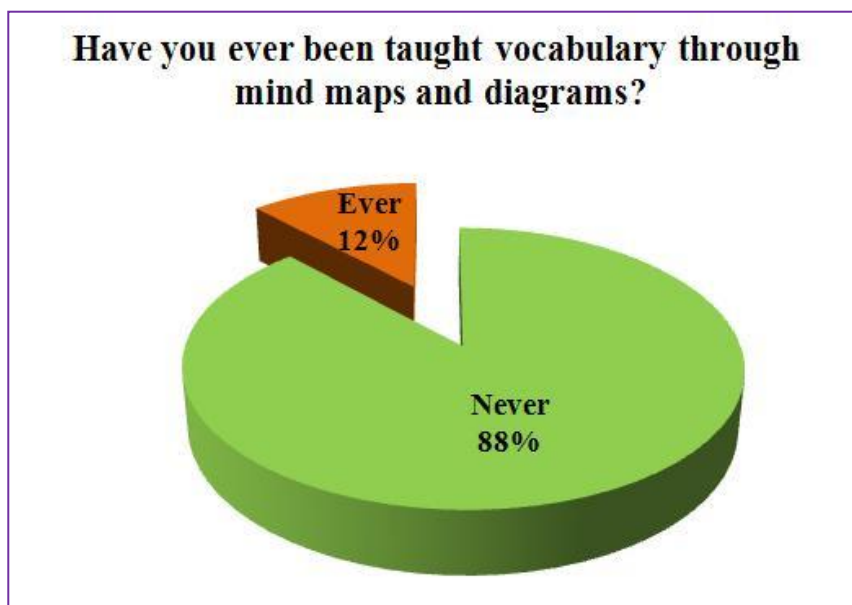


Figure 24: Vocabulary teaching through mind maps and diagrams

Actually, this question was to reinforce the two first questions. When asked about techniques to teach vocabulary together with many other techniques, students pointed out that mind mapping and diagrammatic techniques were hardly used. 12% indicated that they have been applied but not popularly.

Question 5 was also the premise for question 6. Those who answered EVER in question 5 continued to respond to question 6 about their opinions about advantages of learning with mind maps and diagrams in vocabulary sessions. From their answers, there are some benefits for learners which resulted from the teaching with mind maps and diagrams. For instance, mind maps and diagrams help learner remember words better and longer and bring more joy to the learning atmosphere.

2. Research question 2: “Do using mind maps and diagrams work to teach vocabulary for first year mainstream students at Division I?”

The findings of the study or the answers for this question were based on the four channels as follow.

(1) The students’ pretest scores in the experimental and control group

(2) The students’ posttest 1 scores in the Experimental group (X_1)

The students’ posttest 1 scores in the Control group (X_2)

(3) The students’ posttest 2 scores in the Experimental group ($X_{1'}$)

The students’ posttest 2 scores in the Control group ($X_{2'}$)

(4) The calculation of the matched t-test after posttest 1 (t-obtained)

The calculation of the matched t-test after posttest 2 (t'-obtained)

Besides, the semi-structured interview was the reflection from the students who experienced the lesson with mind maps and diagrams. As the voice of students was the most important, they themselves should evaluate a teaching technique. Their answers were even more powerful than any numbers or statistics.

2.1. The students’ pretest scores in the experimental and control group

As stated in the methodology chapter, the pretest was carried out to serve the following purposes. Firstly, it was to check students’ knowledge of the language item which was going to be taught in the trail lessons. Secondly, the test was the foundation to form the 15 matched pairs. The pair matching would be based on the results of students in this test. Pair matching was vital for later analysis of the study to find out the significant difference between the two groups. And already, all the pretest results were presented in Table 4 about *Students’ scores and the reliability coefficient of the test items in Vocabulary Pretest.*

However, the results in table 4 are the correct answers of students not their final scores. Now, the scores would be evaluated with the formula of Individual Scores (Methodology Chapter) as follows.

$$X = \frac{R}{N} \times 100$$

STUDENTS' SCORES IN THE PRETEST

Students' scores (X)	Frequencies (f)	Percentage (%)	Qualification
15	1	40.0	Very poor
20	3		
25	4		
30	2		
35	2		
40	2	26.66	Poor
45	2		
50	4		
55	3	20.0	Enough
60	2		
65	1		
80	2	6.67	Good
90	2	6.67	Excellent
$\sum X = 1365$ $\bar{X} = 45.5$	30	100	

Table 10: Students' scores in the pretest

2.2. The students' scores in posttest 1

Students from two groups took the same test after their lessons. The average posttest 1 score of the students in the experimental group was 94 – an **excellent** result. The highest score was 100 and was reached by only one student. And the lowest score was 75 and was of one student was well. Data distribution of the students' scores in the posttest 1 in experimental group can be seen in the table below.

**STUDENTS' SCORES OF THE EXPERIMENTAL GROUP
IN POSTTEST 1**

Students' scores (X_1)	Frequencies (f)	Percentage (%)	Qualification
75	1	46.67	Good
80	1		
85	5		
90	5	53.33	Excellent
95	2		
100	1		
$\sum X_1 = 1320$ $\bar{X}_1 = 88$	15	100	

Table 11: Students' scores of the Experimental Group in posttest 1

In the control group, the average score was 79.33, much lower than that of experimental group. It was found out that the highest score was 95 and there was no student who had the score of 100. The lowest score was 50, which belonged to the results group of poor qualification.

**STUDENTS' SCORES OF THE CONTROL GROUP
IN POSTTEST 1**

Students' scores (X_2)	Frequencies (f)	Percentage (%)	Qualification
50	1	6.7	Poor
70	3	66.66	Good
75	1		
80	4		
85	2	26.67	Excellent
90	3		
95	1		
$\sum X_2 = 1190$ $\bar{X}_2 = 79.33$	15	100	

Table 12: Students' scores of the Control Group in posttest 1

And here is the comparison between the mean scores of students from two groups.

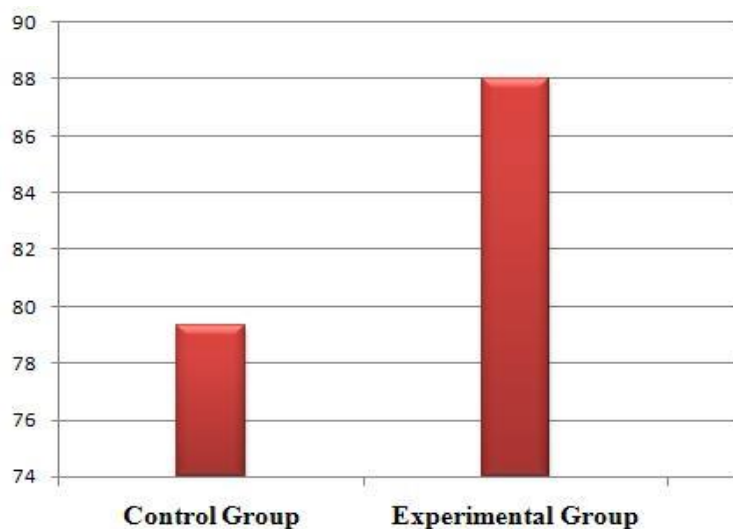


Figure 25: The comparison between average scores in posttest 1 of control and experimental groups

2.3. The students' scores in posttest 2

STUDENTS' SCORES OF THE EXPERIMENTAL GROUP IN POSTTEST 2

Students' scores ($X_{1'}$)	Frequencies (f)	Percentage (%)	Qualification
25	1	13.33	Very poor
35	1		
40	2	13.33	Poor
55	1	33.34	Enough
60	2		
65	2		
70	1	40.0	Good
75	3		
80	1		
85	1		
$\sum X_{1'} = 905$ $\bar{X}_{1'} = 60.33$	15		

Table 13: Students' scores of the Experimental Group in posttest 2

Three weeks after the lessons, students from two groups took another vocabulary test – posttest 2. The same language items were tested to check the memory of students of both groups. After three weeks, students' average score dropped into 60.33 and the scores ranged from 25 to 85. There was no excellent score and there were poor and very poor scores. This result could be understandable because there were no recycling during the period of three weeks.

**STUDENTS' SCORES OF THE CONTROL GROUP
IN POSTTEST 2**

Students' scores (X_2)	Frequencies (f)	Percentage (%)	Qualification
20	1	46.67	Very poor
25	3		
30	2		
35	1		
40	1	13.33	Poor
45	1		
55	2	26.67	Enough
60	1		
65	1		
70	1	13.33	Good
85	1		
$\sum X_2 = 665$ $\bar{X}_2 = 44.33$	15	100	

Table 14: Students' scores of the Control Group in posttest 2

Scores of students from Control Group ranged from 20 to 85. The highest score of this group was 85, which was higher than that of Experimental group. However, there were 8 poor and very poor scores and the average score was only 44.33, which was lower than that of Experimental group (60.33). Moreover, there were only 13.33% good scores in this group, whereas there were 40% in Experimental group.

Hence, it can be concluded that students who learnt with mind maps and diagrams had better memory of language items taught than those who learnt without other techniques.

2.4. The calculations of matched t-test

As presented in the Methodology Chapter, matched t-test calculation is a reliable and important statistic to find out the significant differences between the two groups. Because there were two posttests, then there would be two calculations. Here is the first calculation.

RESULT OF MATCHED T-TEST CALCULATION 1

No	Pretest scores	Posttest 1 scores in Experimental group (X₁)	Posttest 1 scores in Control group (X₂)	D (X₁ - X₂)	D² (X₁ - X₂)²
1	17.5 (C10, E14)	95	85	10	100
2	20 (C1, E13)	85	75	10	100
3	25 (C12, E8)	85	90	-5	25
4	25 (C14, E10)	95	80	15	225
5	30 (C6, E3)	90	70	20	400
6	35 (C11, E11)	90	80	10	100
7	40 (C13, E12)	75	80	-5	25
8	45 (C7, E2)	80	95	-15	225
9	50 (C2, E4)	100	90	10	100
10	50 (C3, E7)	90	90	0	0
11	55 (C4, E15)	85	80	5	25
12	57.5 (C8, E5)	90	50	40	1600
13	62.5 (C9, E1)	85	85	0	0
14	80 (C5, E9)	90	70	20	400
15	90 (C15, E6)	85	70	15	225
	$\Sigma = 682.5$ $\bar{X} = 45.5$	$\Sigma = 1320$ $\bar{X}_1 = 88$	$\Sigma = 1190$ $\bar{X}_2 = 79.33$	$\Sigma = 130$	$\Sigma = 3550$

Table 15: The result of matched t-test calculation 1

According to the formula to calculate t-test (t-obtained) as follows.

$$SD = \sqrt{\frac{\sum D^2 - \frac{1}{n} \sum D^2}{n-1}} = \sqrt{\frac{3550 - \frac{1}{15} 3550}{14}} = 15.38397$$

$$S_{\bar{D}} = \frac{SD}{\sqrt{n}} = 3.972125 \quad t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}} = \frac{88 - 79.33333}{3.972125} = 2.181872$$

→ t-obtained = 2.181872

RESULT OF MATCHED T-TEST CALCULATION 2

No	Pre-test scores	Posttest scores in Experimental group (X ₁)	Posttest scores in Control group (X ₂)	D (X ₁ - X ₂)	D ² (X ₁ - X ₂) ²
1	17.5 (C10, E14)	40	25	15	225
2	20 (C1, E13)	40	25	15	225
3	25 (C12, E8)	35	25	10	100
4	25 (C14, E10)	65	60	5	25
5	30 (C6, E3)	60	65	-5	25
6	35 (C11, E11)	65	85	-20	400
7	40 (C13, E12)	60	40	20	400
8	45 (C7, E2)	70	70	0	0
9	50 (C2, E4)	25	55	-30	900
10	50 (C3, E7)	75	35	40	1600
11	55 (C4, E15)	85	30	55	3025
12	57.5 (C8, E5)	55	30	25	225
13	62.5 (C9, E1)	75	55	20	400
14	80 (C5, E9)	75	20	55	3025
15	90 (C15, E6)	80	45	35	1225
	$\sum = 682$ $\bar{X} = 45.5$	$\sum = 905$ $\bar{X}_{1'} = 60.33$	$\sum = 665$ $\bar{X}_{2'} = 44.33$	$\sum = 240$	$\sum = 1225$

Table 16: The result of matched t-test calculation 2

According to the formula to calculate t-test (t-obtained) as follows

$$SD = \sqrt{\frac{\sum D^2 - \frac{1}{n} \sum D^2}{n-1}} = \sqrt{\frac{12200 - \frac{1}{15}12200}{14}} = 28.519$$

$$S_{\bar{D}} = \frac{SD}{\sqrt{n}} = 7.363574$$

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}} = \frac{60.33333 - 40.33333}{7.363574} = 2.172858$$

→ **t'-obtained = 2.172858**

Based on the Decision Rules, we have the result like this.

Conditions	Results
<p>2.181872 > 2.145 → t-obtained > t-table</p>	<p>Reject Ho → Using mind maps and diagrams to teach vocabulary for first year mainstream students is effective.</p>
<p>2.172858 > 2.145 → t'-obtained > t-table</p>	

Table 17: Decision Results

From the results above, the Alternative Hypothesis was accepted. Or in other words, *using mind maps and diagrams to teach vocabulary for first year mainstream students is proved EFFECTIVE.*

MEAN SCORES OF TWO GROUPS IN VOCABULARY TESTS

	Pretest	Posttest 1	Posttest 2
Experimental Group	45.6	88	60.33
Control Group	45.3	79.33	44.33
Differences	0.3	8.67	16

Table 18: Mean scores of two groups in vocabulary tests

From the calculation of mean scores, it can be seen that after three weeks, the difference was more significant when the distance between the two mean scores of Experimental and Control groups was larger from 8.67 to 16.

2.5. Students' opinions about using mind maps and diagrams to teach vocabulary at Division I

The short semi-structured interview was conducted to find out the attitude and opinions of students towards the use of mind maps and diagrams to teach vocabulary at Division I. The interview was carried out with Experimental group after students finished their second posttest. The reason for the choice of time was that they would have a better review of the techniques' effects on their learning and remembering words after some weeks from the lessons. Name of students would be coded as A, B, C, D, etc to protect their identification when the writer quoted or summarized their responses to four questions below.

- 1) Do you know what mind maps and diagrams are after the lesson?*
- 2) What effects do using mind maps and diagrams have on your vocabulary learning in the lesson?*
- 3) What are the difficulties in learning with mind maps and diagrams?*
- 4) Do you want to learn vocabulary with mind maps and diagrams?*

Question 1

All of students' answers were YES. Some students added that mind maps and diagrams were quite the same to what they thought of them before. At least, after the lesson, students knew some main features of mind maps, which are colors, pictures, central images, key words, branches with basic ordering ideas. However, they did not know how to apply mind mapping and diagrammatic techniques in their learning vocabulary.

Question 2

When asking the second question, the writer also made it clear that “effects” could be both negative and positive. Student 1 said that she could remember the words easily with the image of mind maps in her mind after the lesson. Student 2 added that when she did the test, she imagined the mind maps and tried to locate the words with their positions in the mind maps then she remembered them better. In short, students agreed that mind maps and diagrams helped them remember words better and longer. Student 3 explained after three weeks she could still kept in mind the mind maps that she worked with in the lessons. Moreover, there was one student noting that he felt more enjoyable to learn with mind maps and diagrams because it was new, funny and creative. He loved the feeling of creating and decorating a mind map by himself.

Question 3

For the next questions, the writer wanted students to share their difficulties when learning with mind maps and diagrams. Student 4 thought that she was not good at imagination and drawing. It took her more time to understand the map than her friends. Besides, she couldn't draw well so creating a map herself was impossible. Other students had no idea regarding the difficulties of learning with mind maps and diagrams. Most of them shared the same opinion that mind maps and diagrams brought them more advantages than disadvantages in learning.

Question 4

The last question was to check students' wants to learn with mind maps and diagrams. 14 out of 15 students wanted to be taught with mind maps and diagrams more. They even asked the writer to conduct more trial lessons and they would be willing to take part in those.

However, one student thought that it wasn't necessary to apply such complicated techniques (according to her) to teach vocabulary because students mostly learnt vocabulary by themselves. Others also shared that they would want a combination of mind maps and diagrams with other techniques, for example using pictures or videos.

From the interview, the writer knew that most students were advocates of the techniques of using mind maps and diagrams to teach vocabulary. It was contradictory to the result of the questionnaire when only 10% of the students – the smallest portion preferred the techniques. Students realized the advantages and disadvantages of the techniques, which are unavoidable to any techniques. They also suggested the way to enhance the effectiveness of the techniques.

Summary

From the analysis of the data collected, the writer has discovered that students' ability to remember words was better if they have been taught with mind maps and diagrams. In this chapter, the results of pretest, posttests were presented and compared between two groups. The matched t-test calculations were also done to decide whether accept or reject the Alternative Hypothesis.

CHAPTER V: CONCLUSION

This chapter will review the research findings that have been elaborated in Chapter IV. Afterwards, the pedagogical implication and suggestions will be presented. Next, this last Chapter will pinpoint some limitations of the study and also the suggestions for further studies will be offered.

1. Major findings of the study

Firstly, the study has found out the current situation of using mind maps and diagrams to teach vocabulary for first year English majors at Division I. Mind mapping and diagrammatic techniques have been applied to teach vocabulary; however, they were not very popularly used. Students did know about the techniques from many sources, including in classes of some subjects and skills, but among which vocabulary was not mentioned. Hence, the writer concluded that mind maps and diagrams were not fully exploited in teaching vocabulary at Division I.

Secondly, the vocabulary test results of posttest number 1 and posttest number 2 showed that there was a different achievement on the Experimental Group and Control Group.

In addition, the matched t-test calculation results proved that the treatment given to the students of the Experimental Group had influence on the students' ability in vocabulary memorizing. In other words, using mind maps and diagrams to teach vocabulary can help students have better and longer memory of word items taught.

Thirdly, students after attending a lesson with mind maps and diagrams really wanted to have chance to learn with those techniques. They shared the benefits that mind maps and diagrams did bring to their learning and remembering words through the trial lessons.

Finally, from all the findings of the study, there are two major conclusions which can be withdrawn. Actually, they are answers for two thesis questions. They are as follows.

- 1) *Mind maps and diagrams have ever been applied to teach vocabulary at Division I but they were not popularly used.*
- 2) *Mind mapping and diagrammatic techniques can be used to teach vocabulary at Division I as they have had a positive influence on students' learning and remembering words.*

2. Pedagogical implications and suggestions

The suggestion of the whole study was that using mind maps and diagrams should be used **more popularly** to teach vocabulary for first year mainstream students at Division I. The very first reason was the beneficial effects of the techniques to the learning and remembering vocabulary of students, which were proved through the findings of the study. Another reason was the enjoyment that the techniques can bring to the classroom atmosphere. That was not only the suggestion but also the primary purpose of the study.

3. Limitations of the study

Despite the writer's efforts, the research still bears a number of shortcomings. First of all, the main problem with the method of the study is that it improves internal validity but sacrifices external validity to do so (<http://www.experiment-resources.com/pretest-posttest-designs.html>).

The writer is confident about internal validity of the research as we can place in the cause and effect relationship in a study. External validity is violated when the writer tried to prove that the findings represent the wider population in real world situations. In other words, that was the process of generalization of whether results collected from just a small

sample group can be extended to make predictions about the entire population. Because of the writer's difficulties in time and schedule to work with the target population, only 30 students were actually involved in the research.

The time limitation due to the inconvenience of academic schedule did not allow writers to conduct more trail lessons or enlarge the number of the participants. Actually, this fact was a threat to the external validity of the study as pointed above.

4. Suggestions for further studies

As vocabulary teaching and learning are a potential research interest as in Vietnam there have been not many studies on them. Moreover, mind mapping and diagrammatic techniques are also a new land to explore. Specially, the application of these techniques to teach vocabulary has not had any references in Vietnamese.

At Division I, teaching vocabulary is integrated with teaching skills. Besides with the classification of ELT Program and Double Major Program, studies on teaching vocabulary with mind mapping and diagrammatic techniques for each program can also be a choice of researchers.

5. Contributions of the study

As expected, the study did bring a review on the application of using mind maps and diagrams to teach vocabulary for first year English majors at Division I. In addition, with the findings of it, the study also proved that these techniques can work in the context of teaching vocabulary for the population. It is certain that the study is also a reference for those who want to research on vocabulary or mind mapping and diagrammatic techniques in teaching a language.

Summary

The two research questions of the study have been summarized and highlighted in this chapter. Pedagogical implications and suggestions were also offered in this last chapter of the study. Also, limitations of the study were pointed frankly. Afterwards were the suggestions for further studies as well as the contributions of the study.

REFERENCES

- All, A.C; Huycke, L.I. and Fisher, M.J. (2003). Instructional Tools for Nursing Education: Concept Maps. *Nursing Education Perspectives*. 24(6), 311 – 317.
- AllPsych Online. *Research Methods*. Retrieved on March 25th 2011 from <http://allpsych.com/researchmethods/validityreliability.html>
- Anderson, M. (1997). Introduction to Diagrammatic Reasoning. Retrieved on April 18th 2011 from <http://zeus.cs.hartford.edu/~anderson/intro.html>
- Buzan, T. (1993). *The Mind Map Book*
- Canas, A.J., Novak, J.D and Gonzalez, F.M. (eds) (2004). *What are the major curriculum issues?: The use of mind mapping as a brainstorming exercise*. The first Int. Conference on Concept Mapping (Spain).
- Carter, R. and McCarthy, M.(eds) (1988) *Vocabulary and Language Teaching*. London: Longman
- DePorter, B. and Hernacki, M. (2008). *Quantum Learning: Unleashing the Genius in you*.
- Dimitrov, D.M. and Rumrill, P.D. Jr. (2003). *Pretest-Posttest designs and measurement of change*. Kent State University, College of Education, USA
- Do, T.L.A. (2010). *Using movies and videos to teach English vocabulary to the tenth form students*
- Do, X.M. (2009). *Vocabulary level and vocabulary learning strategies of first year ULIS mainstream English majors*.

- Duppenthaler, P. (2008)0. *Vocabulary Acquisition*. The research and its pedagogical implications.
- Effendi, Y. (2004) *Teaching vocabulary through mind mapping technique to the tenth grade students of SMA Negeri 15 Palembang*. Unpublished undergraduate thesis. Palembang: Faculty of Teacher Training and Education University of PGRI Palembang.
- Fraenkel, Jack R. and Norman E. Wallen (1990). *How to design and Evaluate Research*. New York: MC, Gray-Hill, Inc.
- Gerard, E. D. (Ph.D.) The analysis of Pretest-Posttest Experiments. Accessed on April 22, 2011 from <http://www.jerrydallal.com/LHSP/prepost.htm>
- Ghazel, L. (2007). *Learning vocabulary in EFL contexts through vocabulary learning strategies*. *Novitas-ROYAL* 1(2), 84 – 91.
- Hall, Bert S. (1996). “*The didactic and the Elegant: Some thoughts on Scientific and Technological Illustrations in the Middle Ages and Renaissance*” in B. Braigie (ed.). *Picturing knowledge: historical and philosophical problems concerning the use of art in science*. Toronto: University of Toronto Press. p.9
- Hatch, E. and Farhady, H. (1982). *Research design and statistics for applied linguistics*. Cambridge: Newbury House Publisher, Inc.
- Hedge, T. (2000). *Teaching and Learning in the Language Classroom*. Oxford Handbooks for Language Teacher. Oxford University Press
- Human Memory System. Retrieved on Monday, November 29th from <http://www.nos.org/psy12/p2h7.1.htm>
- Jonassen, D. (2003). *Using Cognitive Tools to Represent Problems*. *Journal of Research on Technology in Education*. 35(3), 326 – 381.

- Lenke, J. M. (April 1977). *Differences between Kuder-Richarson Formula 20 and Formula 21 Reliability Coefficients for short tests with different item variabilities*. New York
- Lowe, R. K. (1993). *Diagrammatic information: techniques for exploring its mental representation and processing*. *Information Design Journal* 7 (1): 3 – 18.
- Mayoux, L.(2003). Thinking it through: Using diagram in impact assessment. Retrieved from <http://homepage.ntlworld.com/mayoux>
- McAleese, R.A (1998). *The knowledge Arena as an Extension to the concept map: Reflection in Action*. *Interactive Learning Environment*. 6(3), 251 – 272.
- McCathy, M. (1990). *Vocabulary*. Oxford: OUP
- Moras, S. (July 2001). *Teaching vocabulary to advanced students: A lexical Approach*.
- Nguyen, T.K.C (2010). *Techniques in teaching vocabulary to young learners at ILA school*
- Rojas, M.M. (October 2008). *Exploring vocabulary acquisition strategies for EFL advanced learner*.
- The Human Memory System. Retrieved on Monday, November 29th from <http://www.uni.edu/walsh/applebymc.html>
- Schmitt, N. (1993). Identifying and assessing vocabulary learning strategies. *Thai TESOL Bulletin Vol.4*.
- Schmitt, N. (1997). Vocabulary learning strategies. In Schmitt, N. & McCarthy, M. (Eds). *Vocabulary: Description, Acquisition and Pedagogy*, Cambridge: Cambridge University Press.

Shin, S.J. and Oliver, L. (2008). "Diagrams", *The Stanford Encyclopedia of Philosophy (Winter 2008 Edition)*, Edward N. Zalta (ed.), from <http://plato.stanford.edu/archives/win2008/entries/diagrams/>

Thornbury, S. (2002). How to teach vocabulary.

White, Jan V. (1984). *Using charts and graphs: 1000 ideas for visual persuasion*. New York: Bowker. Retrieved on April 18th 2011 from <http://medlibrary.org/medwiki/SpecialBookSources/0-8352-1894-5>

Websites

Statistics Calculator (Last viewed on Saturday, March 26, 2011 on <http://www.statpac.com/statistics-calculator/means.htm>)

Statistics and Probability Glossary (Last viewed on March 26th, 2011 from <http://stattrek.com/Help/Glossary.aspx?Target= Matched - pairs%20t-test>

http://www.cc.gatech.edu/classes/cs6751_97_winter/Topics/human-cap/memory.html

<http://www.mind-mapping.co.uk/mind-mapping-benefits.htm>

<http://www.bestpricecomputers.co.uk/glossary/mind-mapping-software.htm>

<http://plato.stanford.edu/entries/diagrams/>

<http://diagrams.org/index1.html>

<http://www.englishonline.org.cn/en/teachers/workshops/teaching-writing/teaching-tips/mind-map>

<http://www.projectsmart.co.uk/cause-and-effect-diagrams.html>

<http://www.csulb.edu/~msaintg/ppa696/696exper.htm>

APPENDIXES

List of appendixes	Page
Appendix 1: Questionnaire for students (English)	70
Appendix 2: Questionnaire for students (Vietnamese)	72
Appendix 3: Semi-structured interview questions	74
Appendix 4: Lesson Plan for Control Group	75
Appendix 5: Lesson Plan for Experimental Group	89
Appendix 6: Vocabulary Test 1 (Pretest Paper)	96
Appendix 7: Key for Vocabulary Test 1	98
Appendix 8: Vocabulary Test 2 (Posttest Paper 1)	99
Appendix 9: Key for Vocabulary Test 2	101
Appendix 10: Vocabulary Test 3 (Posttest Paper 2)	103
Appendix 11: Key for Vocabulary Test 3	104

APPENDIX 1: QUESTIONNAIRE FOR STUDENTS (ENGLISH)

Hi there,

I am Dang Thanh Diem from 07E1. I am conducting a research on the topic “Using mind maps and diagrams to teach vocabulary for first year mainstream students at the Faculty of English Language Teacher Education, ULIS”.

Your assistance in responding to the following questions is highly appreciated. The contents of your answers in this questionnaire are absolutely confidential and information identifying the respondents will not be disclosed under any circumstances.

Thank you very much for your kind cooperation!

Your full name (Optional): Class (Compulsory):

Please put a tick before the statements which are true for you or fill in the blank with your information. For some questions, you can choose more than one option.

1. Which techniques your teachers have used to teach vocabulary?

- | | |
|---|---|
| <input type="checkbox"/> Vietnamese Translation | <input type="checkbox"/> Films and videos |
| <input type="checkbox"/> English Explanation | <input type="checkbox"/> Real objects |
| <input type="checkbox"/> Context Clues | <input type="checkbox"/> Mind maps and diagrams |
| <input type="checkbox"/> Others | |
-
-

2. With which techniques do you like to learn vocabulary?

- | | |
|---|---|
| <input type="checkbox"/> Vietnamese Translation | <input type="checkbox"/> Films and videos |
| <input type="checkbox"/> English Explanation | <input type="checkbox"/> Real objects |
| <input type="checkbox"/> Context Clues | <input type="checkbox"/> Mind maps and diagrams |
| <input type="checkbox"/> Others | |
-
-
-

3. Have you ever heard of Mind mapping and Diagrammatic Techniques?

- Ever Never

*If you choose **Ever** for question 3, please continue with question 4.*

*If you choose **Never** for question 3, please skip question 4 and continue with question 5.*

4. From which ways have you known about mind maps and diagrams?

- From friends
 From books and magazines
 From the Internet
 From teachers (Skills:; Subjects:)
 Other sources

.....
.....
.....

5. Have you ever been taught vocabulary through mind maps and diagrams?

- Ever Never

*If you choose **Ever** for question 5, please continue with question 6.*

6. Which advantages can mind maps and diagrams bring to the learners?

- It will easier and quicker for learners to remember vocabulary items.
 Learners will remember vocabulary items for a long time.
 Learners will be motivated in learning vocabulary.
 Other opinions

.....
.....
.....

Thank you for your respond to this questionnaire!

APPENDIX 2: QUESTIONNAIRE FOR STUDENTS (VIETNAMESE)

Chào bạn,

Mình là **Đặng Thanh Điềm**, là sinh viên lớp K41E1, khoa Sư phạm tiếng Anh, ĐHNH – ĐHQGHN. Mình đang nghiên cứu một đề tài về “**Sử dụng lược đồ tư duy và sơ đồ trong việc dạy từ vựng cho sinh viên năm thứ nhất khoa Sư phạm tiếng Anh**” (*Using mind maps and diagrams to teach vocabulary for first year mainstream students at Division I, the Faculty of English Language Teacher Education, ULIS, VNU*).

Các câu trả lời của bạn trong phiếu khảo sát này là một phần không thể thiếu trong quá trình nghiên cứu của mình nhằm tìm hiểu thực trạng của vấn đề được nghiên cứu đồng thời góp phần tìm ra những kết quả có giá trị cho việc dạy và học từ vựng với đối tượng sinh viên năm thứ nhất khoa Sư phạm tiếng Anh. Thông tin cá nhân, cũng như mọi câu trả lời của bạn sẽ được giữ bí mật tuyệt đối và chỉ được dùng cho mục đích nghiên cứu.

Cám ơn bạn rất nhiều vì đã tham gia nghiên cứu này!

Họ và tên: Khóa/ Lớp

Đánh dấu ✓ vào sự lựa chọn của bạn hoặc điền thông tin vào ô trống.

1. Thầy cô giáo bạn thường dạy từ vựng bằng những cách nào?

- Dịch từ mới sang tiếng Việt
- Giải thích từ bằng tiếng Anh
- Giới thiệu từ thông qua văn cảnh
- Sử dụng phim ảnh hoặc video minh họa
- Sử dụng những giáo cụ trực quan (vật cụ thể, tranh ảnh ...)
- Sử dụng lược đồ tư duy và sơ đồ
- Các hình thức khác:

.....

2. Bạn thích học từ vựng theo cách nào?

- Dịch từ mới sang tiếng Việt
- Giải thích từ bằng tiếng Anh
- Giới thiệu từ thông qua văn cảnh

- Sử dụng phim ảnh hoặc video minh họa
- Sử dụng những giáo cụ trực quan (vật cụ thể, tranh ảnh ...)
- Sử dụng lược đồ tư duy và sơ đồ
- Các hình thức khác:

.....

3. Bạn đã bao giờ biết đến lược đồ tư duy và sơ đồ hay chưa?

- Đã từng
- Chưa từng

*Nếu bạn chọn **đã từng** cho câu 3, xin làm tiếp từ câu 4*

*Nếu bạn chọn **chưa từng** cho câu 3, xin làm tiếp từ câu 5*

4. Bạn biết đến lược đồ tư duy và sơ đồ qua kênh thông tin nào?

- Qua bạn bè chỉ cho biết
- Qua sách, báo
- Qua mạng Internet
- Qua thầy cô (Trong môn:; Trong kỹ năng:)
- Các kênh thông tin khác

.....

.....

5. Bạn đã bao giờ học từ vựng qua lược đồ tư duy và sơ đồ hay chưa?

- Đã từng
- Chưa từng

*Nếu bạn chọn **đã từng** cho câu 5, xin làm tiếp từ câu 6*

6. Theo bạn, học từ vựng thông qua lược đồ tư duy và sơ đồ sẽ mang lại lợi ích gì cho người học?

- Nhớ từ dễ dàng và nhanh hơn
- Nhớ từ trong thời gian dài
- Có hứng thú khi học từ vựng
- Ý kiến khác:

.....

.....

Cám ơn bạn đã trả lời phiếu này!

APPENDIX 3: SEMI-STRUCTURED INTERVIEW QUESTIONS FOR EXPERIMENTAL GROUP

I am **Dang Thanh Diem** from K41E1. I am conducting my graduation paper on *“Using mind maps and diagrams to teach vocabulary for first year mainstream students at the Faculty of English Language Teacher Education, ULIS”*.

Thank you very much for your participating in my research. After the lesson with the use of mind maps and diagrams, I would like to know your opinions towards the lesson.

Thank you again for your kind cooperation!

This interview is conducted to find out the opinions of 15 students from the Experimental Group towards the using of mind maps and diagrams to teach vocabulary. The interview is right after their lesson with mind maps and diagrams to have the most vivid reflection on the technique applied.

QUESTIONS

- 1. Do you know what mind maps and diagrams are after the lesson?*
- 2. What effects do using mind maps and diagrams have on your vocabulary learning in the lesson?*
- 3. What are the difficulties in learning with mind maps and diagrams?*
- 4. Do you want to learn vocabulary with mind maps and diagrams?*

APPENDIX 4: LESSON PLAN FOR CONTROL GROUP

Class description	15 first year mainstream students from Division 1, FELTE, ULIS
Time allowance	20 - 25 minutes
Objectives	<p>After the lesson, students are able to know the meanings and use the words in the theme of Natural World. (Topic: Animals)</p> <p>List of the words: <i>Amphibian, bird, fish, reptile, mammal, insect, frog, toad, salamander, seagull, nightingale, swan, seahorse, whale shark, salmon, turtle, crocodile, snake, pig, tiger, dolphin, butterfly, grasshopper, bee, domain, kingdom, phylum, class, order, family, genus, species, Chordata, Mollusca, Arthropoda.</i></p>
Assumed knowledge	Students have already learnt about the language items.
Anticipated problem(s)	Time is limited
Teaching aids	Blackboard, handouts, color pens
Source	<p>http://www.bio200.buffalo.edu/labs/nomenclature.html</p> <p>http://www.physicalgeography.net/fundamentals/9b.html</p> <p>http://www.indianchild.com/animal_kingdom.htm</p>

TEACHING PROCEDURES

Time	Activities	Notes	Materials
10m	Activity 1		
	<ul style="list-style-type: none"> ✧ Group students in 3 groups ✧ Take turn to choose a cross or a down words → Look at the clue → Give answer ✧ More correct answers → Winner ✧ Introduce 6 types of animals 	<p>Introduce</p> <ol style="list-style-type: none"> 1. Nightingale → Birds 2. Crocodile, Snake → Reptiles 3. Frog → Amphibians 4. Seahorse → Fish 5. Pig, tiger → Mammals 6. Grasshopper → Insects 	Worksheet C1
	<ul style="list-style-type: none"> ✧ Still in groups ✧ Put the name of animals into correct categories 	<p><u>Key</u></p> <p>Amphibians: frog, toad, salamander;</p> <p>Birds: seagull, nightingale, swan;</p> <p>Fish: seahorse, whale shark, salmon;</p> <p>Mammals: pig, tiger, dolphin;</p> <p>Insects: butterfly, grasshopper, bee;</p> <p>Reptiles: turtle, crocodile, snake</p>	Worksheet C2
	<ul style="list-style-type: none"> ✧ Still in groups ✧ Match descriptions with types of animals 	<p><u>Key</u></p> <p>Amphibian: A</p> <p>Birds: C</p> <p>Fish: B</p> <p>Insects: F</p> <p>Mammals: D</p> <p>Reptiles: E</p>	Worksheet C3

15m	Activity 2		
10m	<ul style="list-style-type: none"> ☒ Game: Whispering <ul style="list-style-type: none"> • Two groups • One representative → Receive the sentence: King Phillip came over for good soup • The last person of each group → come to the board → write the sentence down ☒ Lead to Biological Classification ☒ Introduce the currently used classification ☒ Introduce way to remember: King Phillip came over for good soup. 	<p><u>Biological Classification</u> (a method by which biologists group and categorize organism by biological types): Kingdom → Phylum → Class → Order → Family → Genus → Species</p> <p><u>Remember</u></p> <ul style="list-style-type: none"> ☒ King: Kingdom ☒ Phillip: Phylum ☒ Came: Class ☒ Over: Order ☒ For: Family ☒ Good: Genus ☒ Soup: Species 	Worksheet C4
5m	<ul style="list-style-type: none"> ☒ Give worksheet C5 ☒ Read and complete the table individually ☒ Then discuss in groups ☒ Check answers 	<p><u>Key</u></p> <p>Chordata: frog, toad, salamander, seagull, nightingale, swan, seahorse, whale shark, salmon, turtle, crocodile, snake, pig, tiger, dolphin</p> <p>Arthropoda: butterfly, grasshopper, bee</p>	Worksheet C5

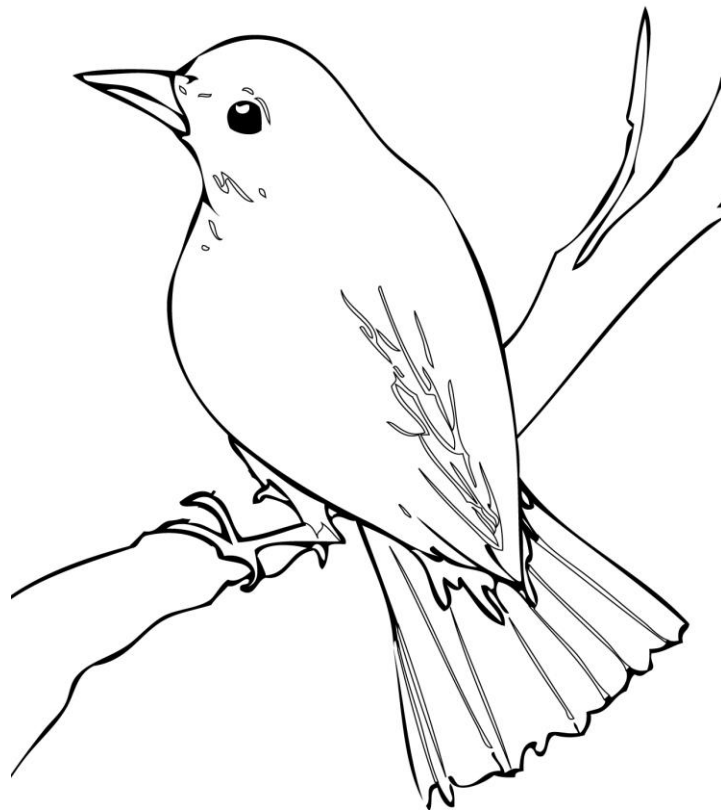
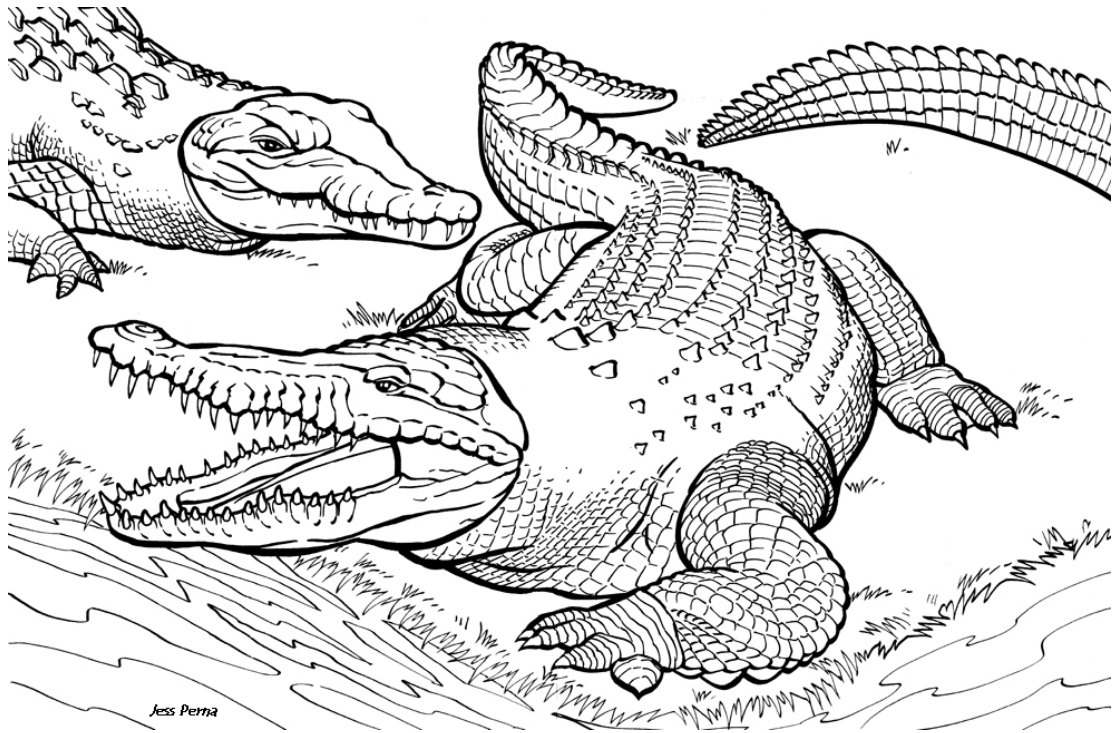
WORKSHEET C1.1
ANIMAL CROSSWORD

		2									5
	1	I		H	3				A		E
					D		4				
	2	R		C			I				O
	1				P						S
3		A			H				E		
	O										
				4		A	K				

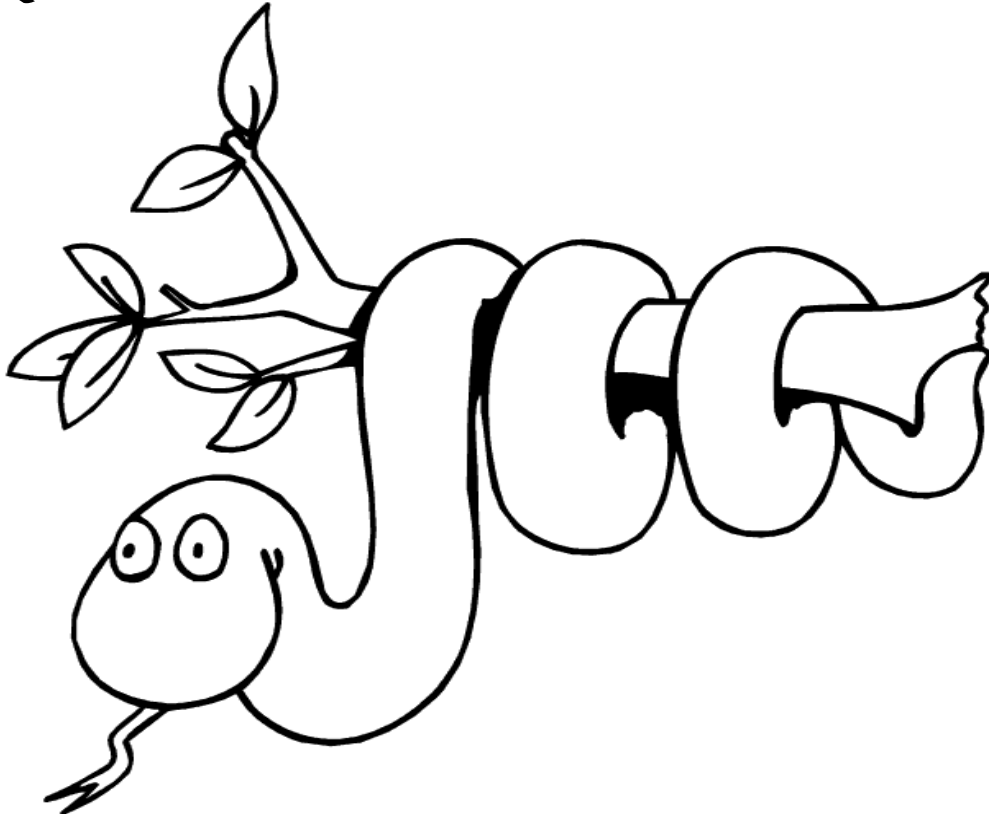
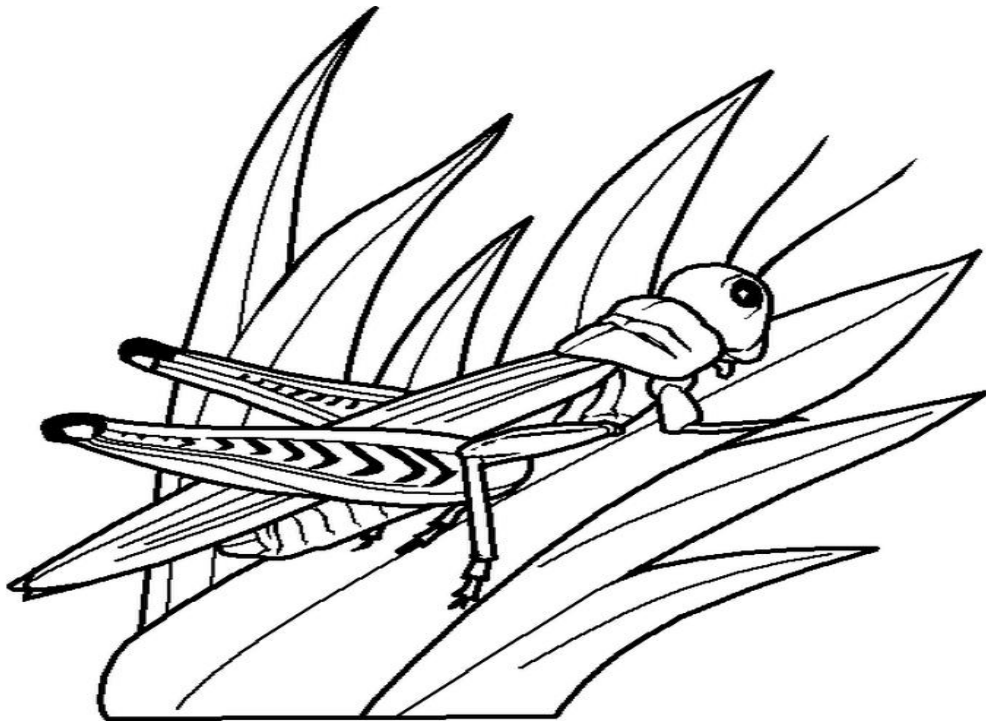
WORKSHEET C1.2
ANIMAL CROSSWORD (KEY)

		T									S
	N	I	G	H	T	I	N	G	A	L	E
		G									A
		E			D		P				H
	C	R	O	C	O	D	I	L	E		O
					L		G				R
	F				P						S
G	R	A	S	S	H	O	P	P	E	R	E
	O				I						
	G			S	N	A	K	E			

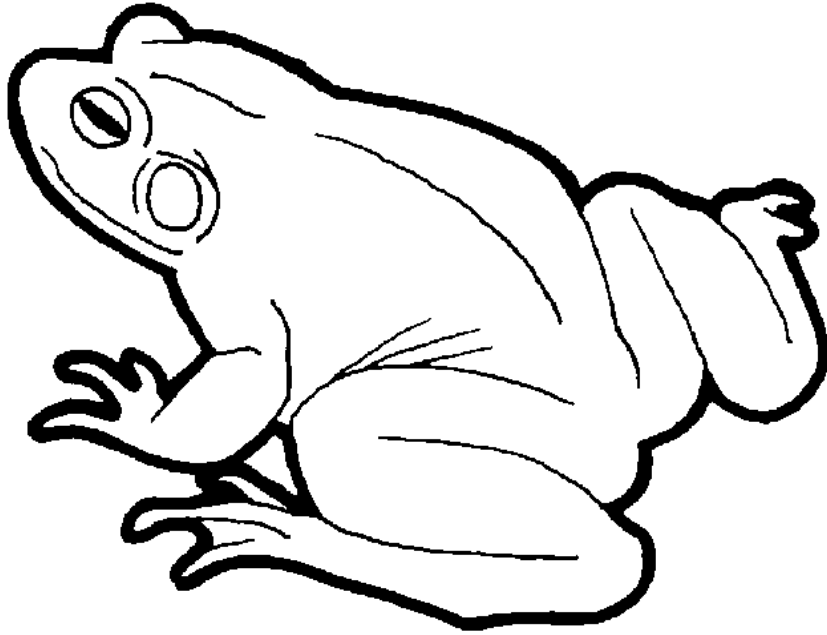
WORKSHEET C1.3
ANIMAL CROSSWORD (CLUES)



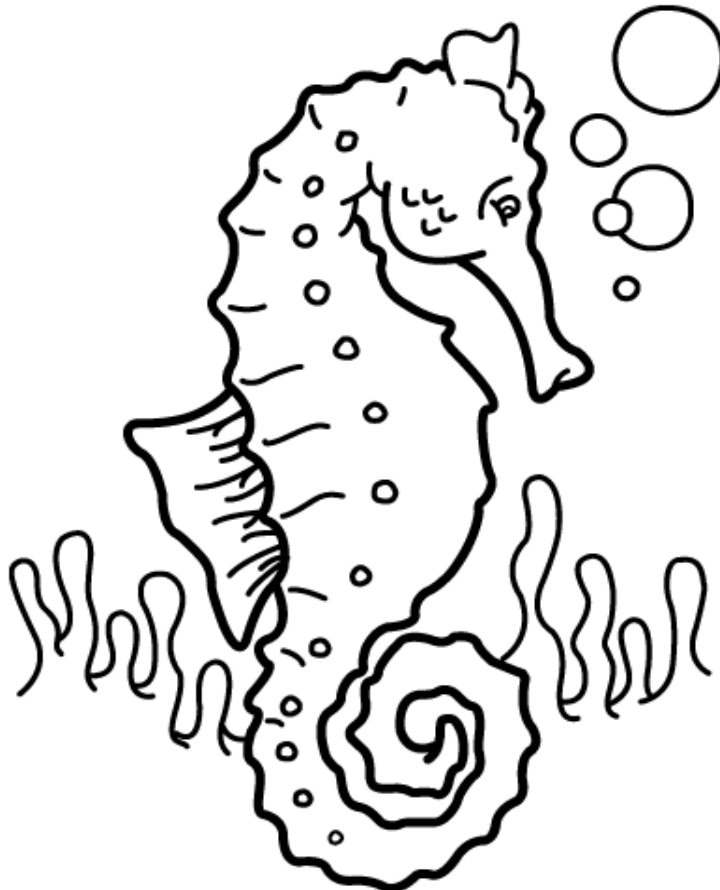
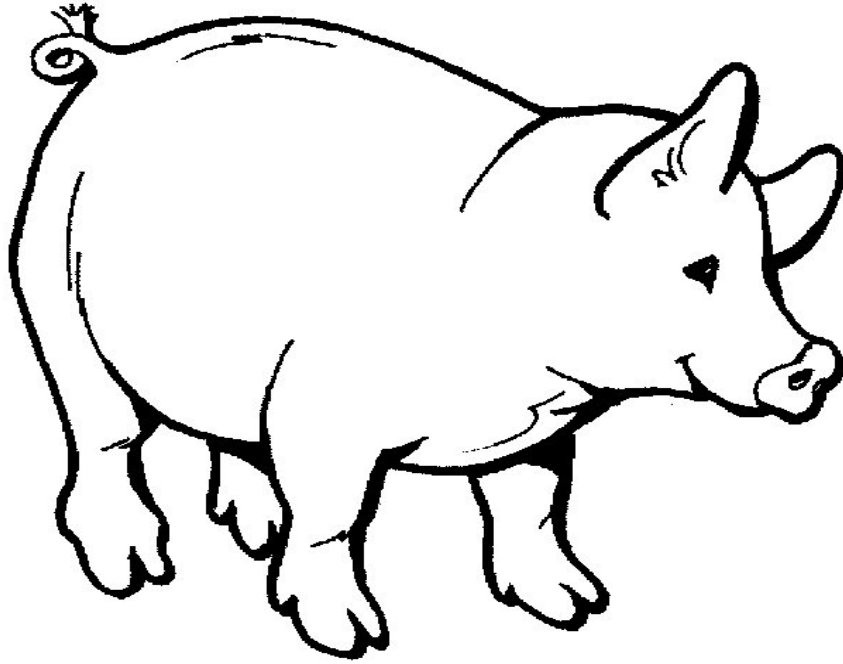
WORKSHEET C1.4
ANIMAL CROSSWORD (CLUES)



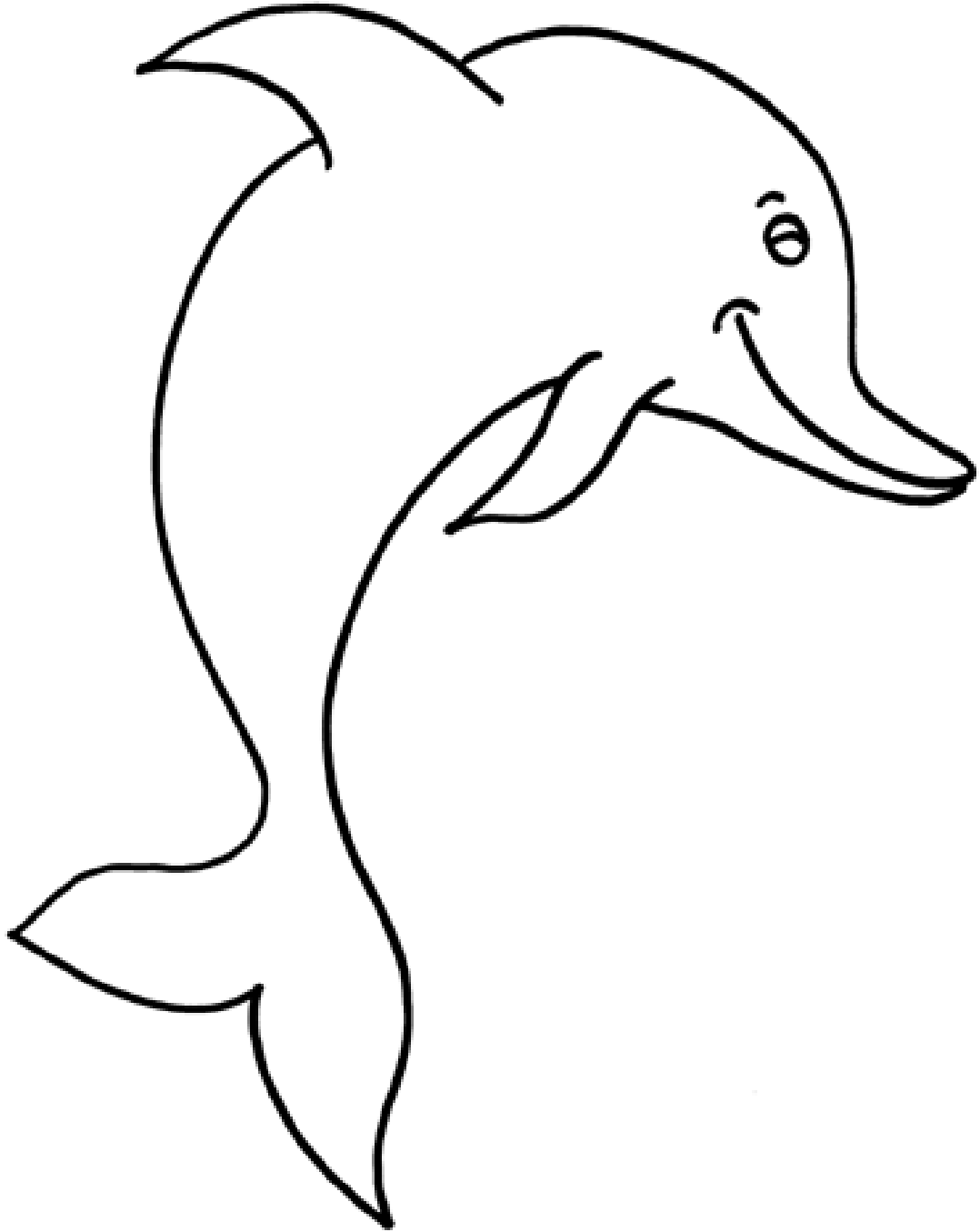
WORKSHEET C1.5
ANIMAL CROSSWORD (CLUES)



WORKSHEET C1.6
ANIMAL CROSSWORD (CLUES)



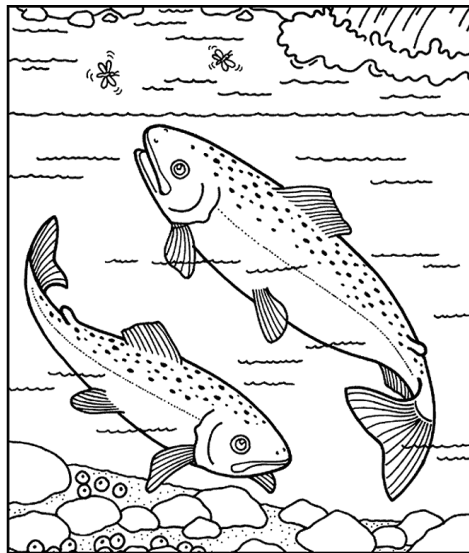
WORKSHEET C1.7
ANIMAL CROSSWORD (CLUES)



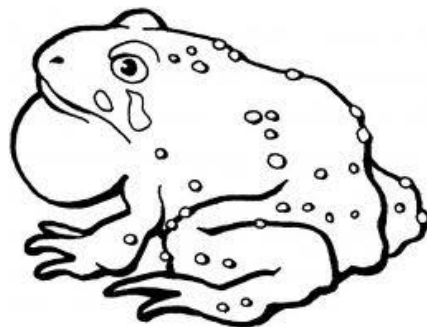
WORKSHEET C2

PUT THE ANIMALS IN THEIR CORRECT CATEGORIES

Types of animals	Examples
Amphibians	Frog,
Birds	Nightingale,
Fish	Seahorse,
Mammals	Tiger, pig,
Reptiles	Crocodile, snake
Insects	Grasshopper,



Some fish, like these salmon, live in the ocean but lay their eggs in streams or rivers. Where are the salmon eggs?



LIST OF ANIMALS

1. butterfly
2. dolphin
3. whale shark
4. ~~snake~~
5. seagull
6. toad
7. ~~crocodile~~
8. ~~pig~~
9. ~~nightingale~~
10. ~~grasshopper~~
11. ~~frog~~
12. bee
13. salmon
14. ~~tiger~~
15. ~~seahorse~~
16. turtle
17. swan

WORKSHEET C3

Match the descriptions with 6 types of animals

Amphibians	Fish	Reptiles
Birds	Insects	Mammals

A	B
are cold-blooded can live on land & in water do not have scales lay eggs in water have moist skin	are cold-blooded & lay eggs are covered with scales have fins not legs live in water breathe through gills
C	D
are animals with feathers are warm-blooded have two legs & two wings have a break & lay eggs	have fur or hair are warm-blooded babies drink milk from their mothers' bodies breathe air through their lungs
E	F
have dry, scaly skin lay many eggs have short legs or no legs at all are cold-blooded breathe air through their lung	have many legs have one or two pair of wings are cold-blooded lay many eggs have one pair of antennae

WORKSHEET C4
BIOLOGICAL CLASSIFICATION

Whisper this sentence to your friends

King Phillip came over for good soup.



Whisper this sentence to your friends

King Phillip came over for good soup.



Whisper this sentence to your friends

King Phillip came over for good soup.

WORKSHEET C5

KINGDOM ANIMALIA

Kingdom Animalia can be split up into many, many phyla. The best known Phylum is Chordata, which contains all animals with backbones (fish, bird, mammals, reptiles, and amphibians). There is also Arthropoda, including insects, crustaceans and spider, Mollusca with snails as a representative and many others.

The next category after Phyla is the Class. The class breaks up animals into even more familiar groups. For example, the Phylum Chordata is broken down into several classes, including birds, reptiles, amphibians, mammals and several others.

Now put the animals from the list to their correct categories.

Kingdom Animalia			
Phylum Mollusca	Phylum Chordata	Phylum Arthropoda	...
Snails		Spider Lobster	

LIST OF ANIMALS

1. butterfly
2. dolphin
3. whale shark
4. snake
5. seagull
6. toad
7. crocodile
8. pig
9. nightingale
10. grasshopper
11. frog
12. bee
13. salmon
14. tiger
15. seahorse
16. turtle
17. swan
18. salamander

APPENDIX 5: LESSON PLAN FOR EXPERIMENTAL GROUP

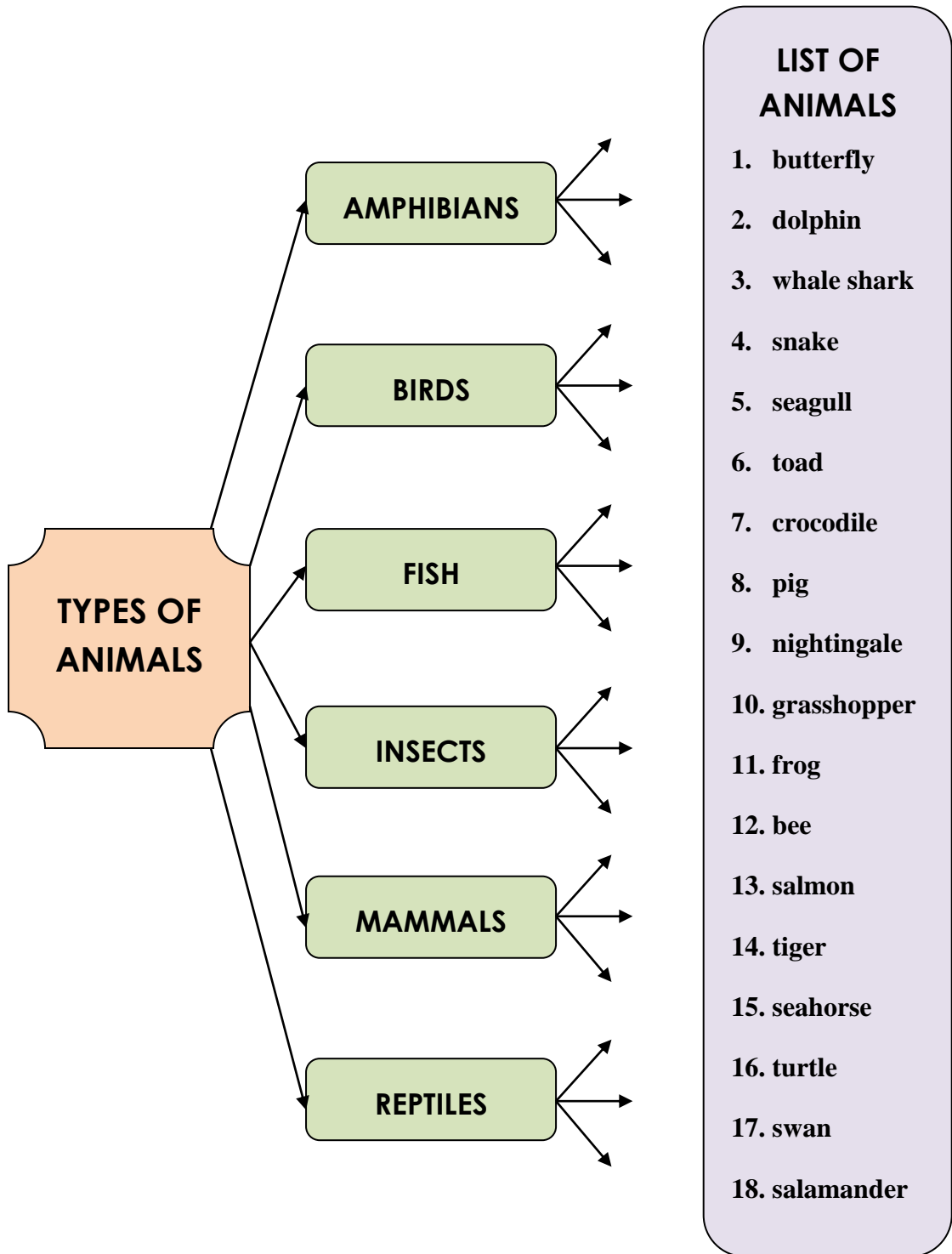
Class description	15 first year mainstream students from Division 1, FELTE, ULIS
Time allowance	20 – 25 minutes
Objectives	<p>After the lesson, students are able to know the meanings and use the words in the theme of Natural World. (Topic: Animals)</p> <p>List of the words: <i>Amphibian, bird, fish, reptile, mammal, insect, frog, toad, salamander, seagull, nightingale, swan, seahorse, whale shark, salmon, turtle, crocodile, snake, pig, tiger, dolphin, butterfly, grasshopper, bee, domain, kingdom, phylum, class, order, family, genus, species, Chordata, Mollusca, Arthropoda.</i></p>
Assumed knowledge	Students have already learnt about the language items.
Anticipated problem(s)	Time is limited
Teaching aids	Blackboard, handouts, color pens
Source	http://www.proprofs.com/games/crossword/wildlife-vocabulary/

TEACHING PROCEDURES

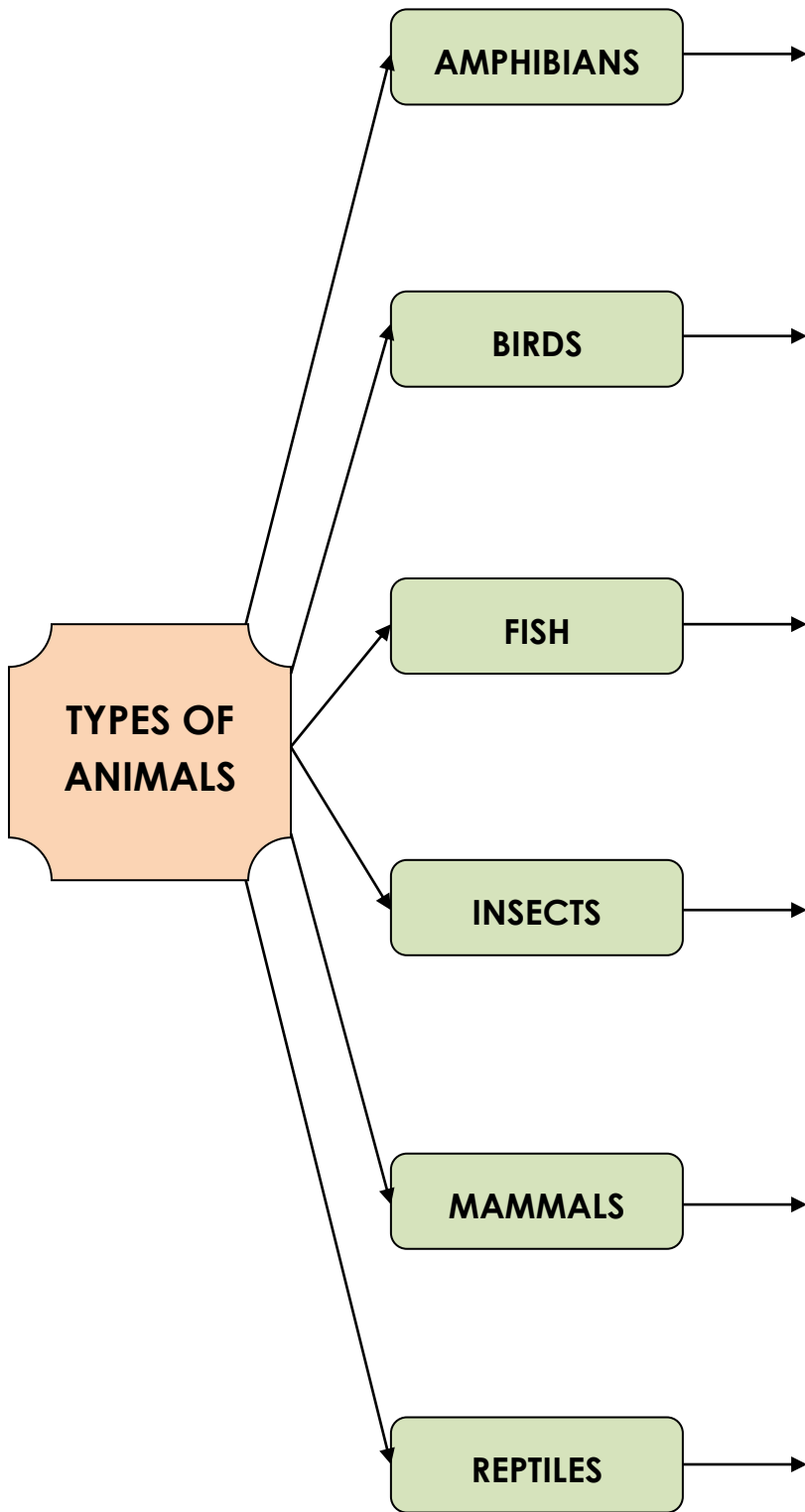
Time	Activities	Notes	Materials
10m	Activity 1		
	<ul style="list-style-type: none"> ✧ Group Ss in 3 groups ✧ Instruct: Put the animals in their correct categories ✧ Cross-check 	<p>Key</p> <p>Amphibians: frog, toad, salamander</p> <p>Birds: seagull, nightingale, swan</p> <p>Fish: seahorse, whale shark, salmon</p> <p>Mammals: pig, tiger, dolphin</p> <p>Insects: butterfly, grasshopper, bee</p> <p>Reptiles: turtle, crocodile, snake</p>	Worksheet E1
	<ul style="list-style-type: none"> ✧ Still in 3 groups ✧ Match the types of animals with their descriptions (Stick the cards of definitions on worksheet E2) 	<p>Key</p> <p>A – C – B – F – D – E</p>	Worksheet E2
10m	Activity 2		
	<ul style="list-style-type: none"> ✧ Group Ss in 3 groups ✧ Put the cards of words in order (Biological Classification) ✧ Cross-check ✧ Explain new words 	<p>Key</p> <p>Domain → Kingdom → Phylum → Class → Order → Family → Genus → Species (Lĩnh thổ → Giới → Ngành → Lớp → Bộ → Họ → Giống/ Chi → Loài)</p>	Worksheet E3
	<ul style="list-style-type: none"> ✧ Still in 3 groups ✧ Fill in the Kingdom Animalia Map with words (1st activity) ✧ Quickest group → winner 	Student work in group	Worksheet E4 Color pens

WORKSHEET E1

PUT THE ANIMALS IN THEIR CORRECT CATEGORIES



WORKSHEET E2.1



WORKSHEET E2.2

LIST OF DESCRIPTIONS

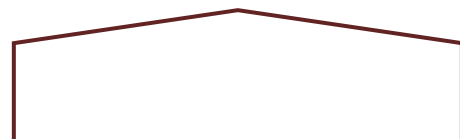
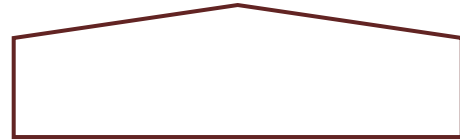
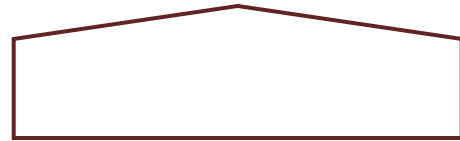
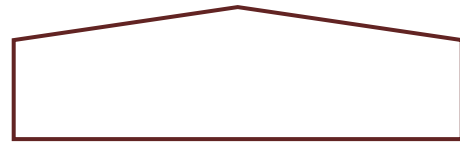
A	B
are cold-blooded can live on land & in water & do not have scales lay eggs in water & have moist skin	are cold-blooded & lay eggs are covered with scales & have fins not legs live in water & breathe through gills

C	D
are animals with feathers & are warm-blooded have two legs & two wings have a beak & lay eggs	have fur or hair & are warm-blooded babies drink milk from their mothers' bodies breathe air through their lungs

E	F
have dry, scaly skin & lay many eggs have short legs or no legs at all are cold-blooded & breathe air through their lung	have many legs & have one or two pair of wings are cold-blooded & lay many eggs have one pair of antennae

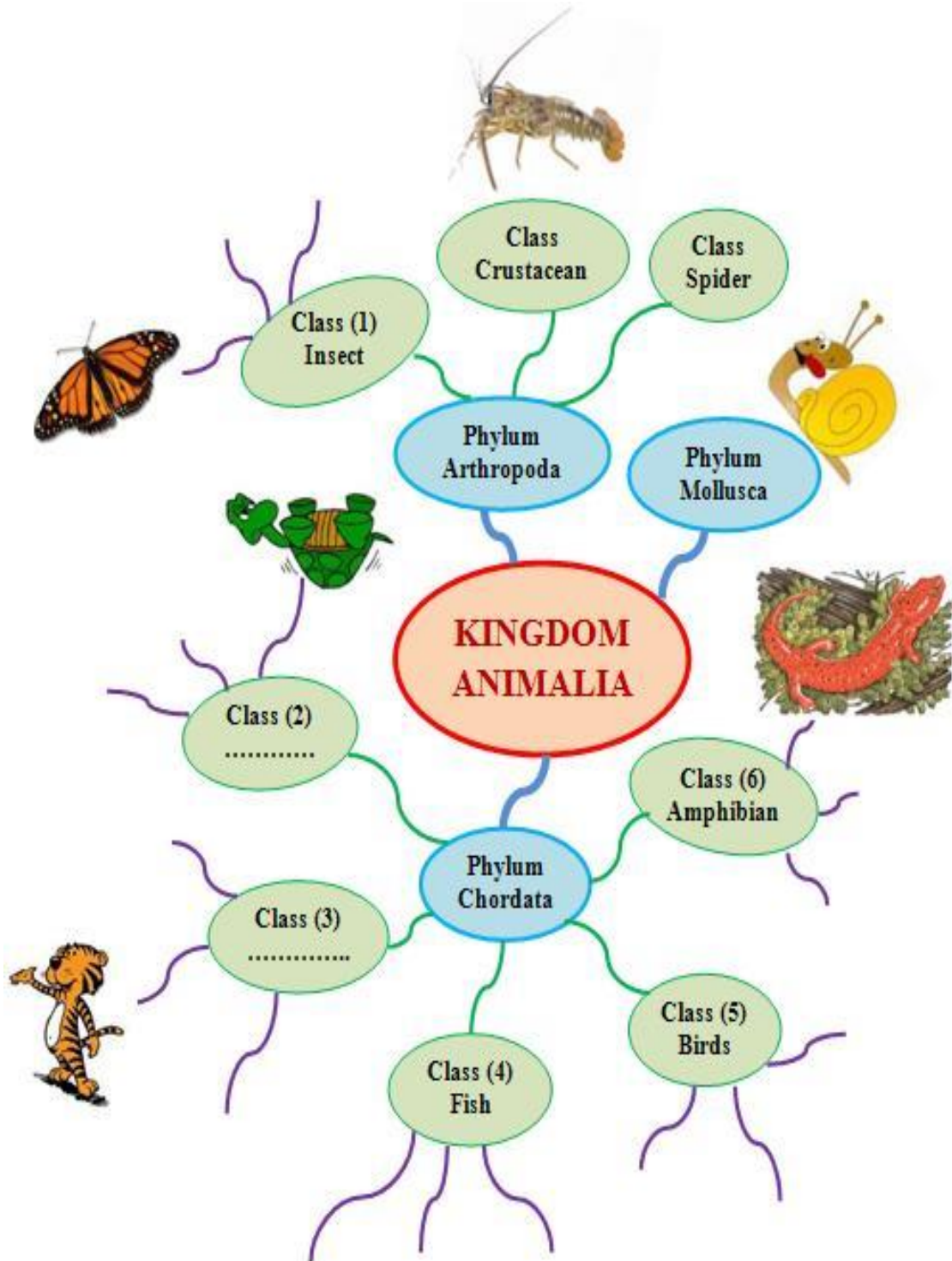
WORKSHEET E3
BIOLOGICAL CLASSIFICATION

Kingdom	Order	Class	Family
Genus	Species	Phylum	Domain



WORKSHEET E4

KINGDOM ANIMALIA



APPENDIX 6: VOCABULARY TEST 1 (PRETEST)

Time allowance: 15 minutes

Date: March 30, 2011

Name of student: Class:

I. Odd one out

Which animal is more different from the other two animals?

1. A. whale shark B. dolphin C. seahorse
2. A. grasshopper B. butterfly C. frog
3. A. spider B. crocodile C. turtle
4. A. snake B. salmon C. whale shark
5. A. toad B. salamander C. pig

II. Choose the best answers A, B or C

6. Seagull, nightingale and swan all belong to?
A. birds B. mammals C. insects
7. Which of the following animals **doesn't** belong to amphibians?
A. frog B. salamander C. tiger
8. Which of the following Biological Classification is correct?
A. Kingdom → Phylum → Class → Order → Family → Genus → Species
B. Kingdom → Class → Phylum → Family → Species → Order → Genus
C. Kingdom → Phylum → Order → Class → Family → Genus → Species
9. Which of the following classes **doesn't** belong to Phylum Chordata?
A. Fish B. Insects C. Birds
10. Amphibian, Reptiles and Mammals all belong to Phylum?
A. Arthropoda B. Mollusca C. Chordata

III. Match the animals in A with their correct categories in B

A
1. dolphin
2. salamander
3. grasshopper
4. seahorse
5. crocodile
6. swan

B
A. Amphibians
B. Birds
C. Fish
D. Mammals
E. Insects
F. Reptiles

IV. Fill in each blank with one suitable word from the box to complete the sentences

A. Chordata	C. Arthropoda
B. phyla	D. Whale shark

1. In the Kingdom Animalia, there are many (17) _____.
2. (18) _____ belongs to Class Fish, which is under the Phylum (19) _____.
3. Insects such as fly, bee or mosquito are under the Phylum (20) _____.

Thank for your kind cooperation!

APPENDIX 7: KEY FOR VOCABULARY TEST 1 (PRETEST)

Time allowance: 15 minutes

ANSWER KEY

I. Odd one out

1. B
2. C
3. A
4. A
5. C

II. Choose the best answers

6. A
7. C
8. A
9. B
10. C

III. Match the animals in A with their correct categories in B

11. D
12. A
13. E
14. C
15. F
16. B

IV. Fill in each blank with one suitable word from the box

17. B
18. D
19. A
20. C

APPENDIX 8: VOCABULARY TEST 2 (POSTTEST 1)

Time allowance: 15 minutes

Date: March 30, 2011

Name of student: Class:

I. Odd one out

Which animal is more different from the other two animals?

1. A. butterfly B. frog C. snake
2. A. whale shark B. dolphin C. spider
3. A. grasshopper B. salamander C. bee
4. A. toad B. salmon C. seahorse
5. A. snake B. crocodile C. swan

II. Choose the best answers A, B, or C

6. Fish, Amphibians and Birds belong to Phylum
- A. Arthropoda B. Mollusca C. Chordata
7. Insects, Reptiles and Mammals are
- A. Kingdoms B. Classes C. Orders
8. **doesn't** belong to Phylum Arthropoda.
- A. Insects B. Crustacean C. Reptiles
9. Which of the following Biological Classification is correct?
- A. Genus → Order → Species → Family → Class → Phylum → Kingdom
- B. Species → Genus → Family → Order → Class → Phylum → Kingdom
- C. Species → Genus → Order → Family → Phylum → Class → Kingdom

10. Which animal belongs to Reptiles?
 A. crocodile B. butterfly C. grasshopper
11. Both crocodile and seagull belong to
 A. Reptiles B. Arthropoda C. Chordata
12. Seagull belongs to
 A. Fish B. Birds C. Amphibians
13. Salamander belongs to
 A. Insects B. Arthropoda C. Amphibians
14. Dolphin belongs to
 A. Fish B. Chordata C. Both A & B

III. Match the animals in A with their correct categories in B

A
15. nightingale
16. frog
17. salmon
18. tiger
19. butterfly
20. turtle

B
G. Amphibians
H. Birds
I. Fish
J. Mammals
K. Insects
L. Reptiles

Thank for your kind cooperation!

APPENDIX 9: KEY FOR VOCABULARY TEST 2 (POSTTEST 1)

Time allowance: 15 minutes

ANSWER KEY

I. Odd one out

1. A
2. C
3. B
4. A
5. C

II. Choose the best answers

6. C
7. B
8. C
9. B
10. A
11. C
12. B
13. C
14. C

III. Fill in each blank with one suitable word from the box

15. B
16. A
17. C
18. D
19. E
20. F

APPENDIX 10: VOCABULARY TEST 3 (POSTTEST 2)

Time allowance: 15 minutes

Date: April 19th, 2011

Name of student: **Class:**

I. Odd one out

Which animal is more different from the other two animals?

- | | | | |
|----|---------------|----------------|---------------|
| 1. | A. Arthropoda | B. Chordata | C. Crustacean |
| 2. | A. spider | B. salamander | C. tiger |
| 3. | A. butterfly | B. grasshopper | C. turtle |
| 4. | A. Bird | B. Fish | C. Insects |
| 5. | A. dolphin | B. snake | C. crocodile |

II. Choose the best answers A, B, or C

6. belong to Phylum Chordata
- | | | |
|-------------|---------------|---------------|
| A. Reptiles | B. Amphibians | C. Both A & C |
|-------------|---------------|---------------|
7. Which animal belongs to Phylum Chordata?
- | | | |
|-----------|----------------|----------------|
| A. spider | B. whale shark | C. grasshopper |
|-----------|----------------|----------------|
8. Pig and dolphin belong to
- | | | |
|------------|-------------|---------------|
| A. Mammals | B. Chordata | C. Arthropoda |
|------------|-------------|---------------|
9. Which animal belongs to Amphibians?
- | | | |
|--------------|--------------|---------|
| A. Butterfly | B. Crocodile | C. Toad |
|--------------|--------------|---------|
10. Which animal belongs to Reptiles?
- | | | |
|----------|--------------|----------------|
| A. Snake | B. butterfly | C. grasshopper |
|----------|--------------|----------------|

III. Fill in the blank with ONE suitable word to complete the sentence

11. Insect belongs to Phylum
12. Seagull belongs to Class
13. Salamander belongs to Class
14. Snail belongs to Phylum
15. Turtle and Snake belong to Class

IV. Put the name of units in B with their correct order in A

A	B
Kingdom	Kingdom
21.	M. Genus
22.	N. Family
23.	O. Class
24.	P. Phylum
25.	Q. Order
Species	Species

Thank for your kind cooperation!

APPENDIX 11: KEY FOR VOCABULARY TEST 3 (POSTTEST 2)

Time allowance: 15 minutes

ANSWER KEY

I. Odd one out

1. C
2. A
3. C
4. C
5. B

II. Choose the best answers

6. C
7. B
8. B
9. C
10. A

III. Fill in each blank with ONE suitable word to complete the sentence

11. Anthropoda
12. Fish
13. Amphibian(s)
14. Mollusca
15. Reptile(s)

IV. Put the name of units in B with their correct order in A

16. D
17. C
18. E
19. B
20. A