THE IMPACT OF SENTENCE WRITING STRATEGY ON DEVELOPING EFL LEARNERS’ VOCABULARY MEMORIZATION

The Case of First Year Students at Mobarek El- Mili Secondary School

-Ain Babouche -

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Master in Language Sciences and Teaching English as a Foreign Language

By: Sara BOUAKAZ

Supervisor: Mrs. Samira ARROUF

 Examiner: Mrs. SNOUSSI

2014-2015
In the name of ALLAH, Most Gracious, Most Merciful

All the praise is due to God alone, the Sustainer of the entire world.

This thesis is dedicated:

To my wonderful parents (Abd El- Razzek and Chahinez), who have raised me to be the person I am today. You have been with me every step of the way. Thank you for all the unconditional love, guidance and support that you have always given to me to succeed.

To my dear ‘Ben Saada- allah Bilal’ because of his constant support, unconditional help and continuous encouragement.

To my grandmother: Zamar Fatima.

To my lovely sisters: Zakia-souhila and Ayet-el rahman.

To my brothers: Soufien and Hichem.

To my best friend: Ounes Houria.

To all my family.

To all my teachers.
Before all, I thank ALLAH for giving me strength and capacity to complete this work.

My deepest appreciation goes to my supervisor Mrs. Samira ARROUF for her understanding, encouragement, valuable references and precious advice.

I am also thankful and greatly indebted to Mrs. Soumia KRAZZA and Mrs. Khalida MAAMRI who have generously given me their time as well as I am very grateful to first year students at Mobarek el-Mili Secondary school for being cooperative and working seriously because it would not have been possible without their help.

Finally, I am also thankful to my parents who have always prayed for me and besought God to help me.

Thank you all.
ABSTRACT

The present study has been conducted in order to investigate the effect of using sentence writing strategy on developing vocabulary memorization of first year secondary school students. For the sake of achieving the research purpose, an experimental method with a quasi-experimental design has been conducted where two pre-existing groups were randomly assigned as experimental and control groups. The target sample comprised seventy-three students studying first year (scientific stream) at Mobarek El- Mili Secondary School in Ain Babouche - Oum El Bouaghi-for the academic year 2014- 2015. Additionally, participants of both experimental and control groups were pre-tested using a vocabulary matching task. After administering the pre-test, the treatment has been conducted for both groups for four sessions. The experimental group was taught vocabulary using sentence writing strategy and the control group was taught vocabulary through word list, the ordinary method used by their teacher. Then, both groups were post-tested through the same vocabulary matching task used in the pre-test. After analyzing the obtained results, the alternative hypothesis was proved. That is to say, sentence writing strategy has a positive effect on developing students’ ability to memorize the target vocabulary.
LIST OF ABBREVIATIONS

**COG**: Cognitive Strategies.

**DET**: Determination Strategies.

**E.F.L**: English as a Foreign Language.

*i.e.* It means.

**L1**: First Language.

**L2**: Second Language.

**LTM**: Long-Term Memory.

**MEM**: Memory Strategies.

**MET**: Metacognitive Strategies.

**n.d**: no date.

**SLA**: Second Language Acquisition.

**SOC**: Social Strategies.

**STM**: Short-Term Memory.

**VLSs**: Vocabulary Learning Strategies.
## List of Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Table’s Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1.1</td>
<td>Schmitt’s Classification of Vocabulary Learning Strategies</td>
<td>13</td>
</tr>
<tr>
<td>Table 2.1</td>
<td>The Interpretation of the Research Design’s Schematic Representation</td>
<td>35</td>
</tr>
<tr>
<td>Table 2.2</td>
<td>The Frequency of the Experimental and Control Groups’ Scores on the Vocabulary Matching Task</td>
<td>39</td>
</tr>
<tr>
<td>Table 2.3</td>
<td>Square Pre-test Scores of Both Groups on the Matching Task</td>
<td>42</td>
</tr>
<tr>
<td>Table 2.4</td>
<td>The Control Group’s Square Difference Scores on the Vocabulary Matching Task</td>
<td>46</td>
</tr>
<tr>
<td>Table 2.5</td>
<td>The Experimental Group’s Square Difference Scores on the Vocabulary Matching Task</td>
<td>49</td>
</tr>
<tr>
<td>Table 2.6</td>
<td>Square Post-test Scores of Both Groups on the Matching Task</td>
<td>53</td>
</tr>
</tbody>
</table>
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Figure’s Title</th>
<th>page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure1.1</td>
<td>The Types of Knowledge Involved in Knowing a Word</td>
<td>8</td>
</tr>
<tr>
<td>Figure1.2</td>
<td>A Diagrammatic Representation of Information Processing</td>
<td>17</td>
</tr>
</tbody>
</table>
CONTENTS

INTRODUCTION ................................................................................................................................. 2
Statement of the Problem ...................................................................................................................... 2
Aim of the Study .................................................................................................................................... 3
Research Question and Hypothesis ....................................................................................................... 3
Means of Research ................................................................................................................................ 4
Structure of the Dissertation ................................................................................................................ 4

Chapter One: Theoretical Background
Section One: Vocabulary and the Process of Memorization

Introduction ........................................................................................................................................... 7

1.1.1 What Is Meant by the Concept of Vocabulary? .......................................................................... 7
1.1.2 What Is Involved in Knowing a Word? ...................................................................................... 8
1.1.3 Types of Vocabulary .................................................................................................................. 9

1.1.3.1 Productive and Receptive Vocabulary ................................................................................ 9

1.1.4 Vocabulary Learning Strategies (VLSs) .................................................................................. 9

1.1.4.1 Definition of Vocabulary Learning Strategies ..................................................................... 10
1.1.4.2 Schmitt’s Classification of Vocabulary Learning Strategies .............................................. 11

1.1.4.2.1 Discovery Strategies ..................................................................................................... 11

1.1.4.2.1.1 Determination Strategies (DET) .............................................................................. 11
1.1.4.2.1.2 Social Strategies (SOC) ......................................................................................... 11

1.1.4.2.2 Consolidation Strategies ................................................................................................. 12

1.1.4.2.2.1 Memory Strategies (MEM) .................................................................................... 12
1.1.4.2.2.2 Cognitive Strategies (COG) .................................................................................... 12
1.1.4.2.2.3 Metacognitive Strategies (MET) .............................................................................. 12
Section Two: Sentence Writing Strategy

Introduction ............................................................................................................. 22

1.2.1 The Nature of Sentence Writing Strategy ...................................................... 22

1.2.2 The Task of Sentence Writing ..................................................................... 23

1.2.2.1 Sentence Writing as a Deep Processing Activity .................................. 23

1.2.2.2 Sentence Writing as a Generative Activity ........................................... 24

1.2.2.3 Sentence Writing as an Output Activity ................................................ 24

1.2.3 The Effectiveness of Using Sentence Writing Strategy on Developing
Vocabulary memorization ...................................................................................... 25

1.2.3.1 Positive Effect of Sentence Writing Strategy ....................................... 26

1.2.3.2 Negative Effect of Sentence Writing Strategy ....................................... 28

Conclusion ............................................................................................................. 29

CHAPTER TWO: PRACTICAL FRAMEWORK (ANALYSIS AND
DISCUSSION OF THE RESULTS)

Introduction ............................................................................................................. 33

2.1 The Choice of the Method ............................................................................. 33

2.2 The Sample ................................................................................................... 33
2.3 The Research Design

2.4 Procedures

2.4.1 Pre-testing

2.4.2 Treatment

2.4.2.1 Experimental Group Instruction

2.4.2.2 Control Group Instruction

2.4.3 Post-testing

2.5 Instruments

2.5.1 Test Used in Pre-test and Post-test (Matching task)

2.6 Scoring

2.7 Statistical Analysis

2.8 Results

2.8.1 Results of the Vocabulary Matching Task

2.8.2 Control Group versus Experimental Group Scores on the Pre-test

2.8.2.1 The Independent-Samples t-test

2.8.3 Control Group Post-test versus Control Group Pre-test

2.8.3.1 The Paired-Samples t-test of the Control Group

2.8.3.2 Procedures for Carrying out a Paired-Samples t-test
2.8.4 Experimental Group Post-test versus Experimental Group Pre-test.............48

2.8.4.1. The Paired-Samples t-test of the Experimental Group.........................48

2.8.5 Control Group versus Experimental Group on the Post-test.......................51

2.8.5.1 The Independent-Samples t-test............................................................52

General Discussion..............................................................................................55

GENERAL CONCLUSION ....................................................................................57

REFERENCES.......................................................................................................58

APPENDICES

RESUME

المتخص
Introduction

Learning occupies a very significant place in our daily life. It is considered as the basis for the development and progress of human society. One of the most exciting and attractive aspects of human development is language learning. When learning a language, a very important aspect that should be mastered is vocabulary. Learning vocabulary would be unsuccessful and the learning efforts would go in vain if the vocabulary that is learned cannot be remembered. For this reason, whatever is learned needs to be stored in the mind so that it can be remembered whenever is needed in the future. In other words, when we learn, we are supposed to memorize what we have learned in order to bring them back when it is necessary.

The faculty of mind that enables learners to store and remember the stimuli they have exposed to during the learning process is known as ‘Memory’ and its process is called ‘Memorization’. Among these stimuli, there are ‘words’ which are considered as the basic unit of language since without sufficient vocabulary learners cannot learn a foreign language.

Thus, vocabulary memorization plays an important role in second language acquisition because vocabulary helps us to express our thoughts, ideas and feelings even when we use them in grammatically incorrect sentences. For this reason, teachers are required to adopt strategies that facilitate the task of vocabulary memorization.

Statement of the Problem

The memorization of vocabulary is a fundamental component for second language learners. That’s why they devote large amount of time and efforts to the task of mastering a new vocabulary in order to be able to comprehend the written or oral
documents that have been presented to them as well as to communicate effectively. Despite its importance, vocabulary memorization is considered as a difficult task because it is not easy for learners to memorize all the words that have been exposed to during the learning process.

The difficulty of memorizing the vocabulary that is learned can be reduced by adopting the strategy of sentence writing which is considered as a helpful tool used to facilitate memorizing the new vocabulary.

Aim of the Study

The major aim of this research is to investigate the effectiveness of sentence writing strategy on developing students’ vocabulary memorization. In other words, it attempts to find out whether students who write the new target words in their own sentences would memorize them better than those who do not.

Research Question and Hypothesis

The following question is addressed in this study:

Does sentence writing strategy have any effect on developing students’ vocabulary memorization?

In order to answer this question, it is hypothesized that:

Students who learn vocabulary through sentence writing strategy would show better memorization of vocabulary than those who do not.
Means of the Research

To collect the data required, an experimental method with a quasi-experimental design was adopted in which two pre-existing groups were assigned to experimental and control groups. The target sample comprised seventy-three students. For the sake of answering the research question, the same test was administered to both groups before and after the treatment period. The pre-test was conducted to check whether the participants have the same level of vocabulary learning. Then, the post-test, which was similar to the pre-test, was administered to compare vocabulary memorization performance of both groups after the treatment phase. The test was made up of one vocabulary matching task which contained twelve different words in order to be matched with their appropriate definitions.

Structure of the Dissertation

This research is basically divided into two main chapters. The first chapter is devoted to the theoretical part and the second chapter is devoted to the analytical part.

The first chapter is divided into two sections. The first section presents aspects of vocabulary, the process of memorization and vocabulary memorization. The second section tackles the nature and the task of sentence writing strategy as well as the positive and negative effects of sentence writing strategy on vocabulary memorization.

The second chapter is devoted to the description of the experimental study. It presents the choice of the method, the sample, the research design, data collection procedures i.e. pre-test, treatment and post-test, instruments, scoring as well as the analysis and interpretation of the data gathered from pre and post-tests.
CHAPTER ONE

THEORITICAL BACKGROUND
Chapter One: Theoretical Background

Section One: Vocabulary and the Process of Memorization

Introduction

1.1.1 What Is Meant by the Concept of Vocabulary?

1.1.2 What Is Involved in Knowing a Word?

1.1.3 Types of Vocabulary

1.1.3.1 Productive and Receptive Vocabulary

1.1.4 Vocabulary Learning Strategies (VLSs)

1.1.4.1 Definition of Vocabulary Learning Strategies

1.1.4.2 Schmitt’s Classification of Vocabulary Learning Strategies

1.1.4.2.1 Discovery Strategies

1.1.4.2.1.1 Determination Strategies (DET)

1.1.4.2.1.2 Social Strategies (SOC)

1.1.4.2.2 Consolidation Strategies

1.1.4.2.2.1 Memory Strategies (MEM)

1.1.4.2.2.2 Cognitive Strategies (COG)

1.1.4.2.2.3 Metacognitive Strategies (MET)

1.1.5 The Importance of Vocabulary in EFL Classrooms

1.1.6 The Process of Memorization

1.1.7 Vocabulary Memorization

Conclusion
Introduction

Due to the development of new approaches to language teaching, incorporating vocabulary in educational programs and curricula becomes essential. This interest in vocabulary teaching and learning raises because vocabulary knowledge helps students to understand what has been presented to them whether in written or oral forms and to communicate effectively. Furthermore, vocabulary is considered as a helpful element that develops the four skills, namely: speaking, listening, reading and writing because it improves one’s ability to speak, listen, read and write.

This section tackles the concept of vocabulary, the process of memorization and vocabulary memorization.

1.1.1 What Is Meant by the Concept of Vocabulary?

The concept of vocabulary has been defined by Cambridge International Dictionary of English (1995) as “all the words used by a particular person or all the words which exist in a particular language” (p.1628).

Gardener (2009, as cited in Adger, 2002) argued that vocabulary is not only concerned with the word meaning, but it is also about how these words are structured in a language, how they are used, memorized and learned by learners. Furthermore, Miller (1999, as cited in Zimmerman, 2007) believed that vocabulary is a set of words that are the basic building blocks used in the generation and understanding of sentences. Finally, Nash and Snowling (2006, as cited in Hansen, 2009) stated that vocabulary is “the knowledge of words and their meaning” (p.336). To sum up, most of the scholars supported the idea that vocabulary is about the word’ meanings.
1.1.2 What Is Involved in Knowing a Word?

In order to be able to use a word effectively in a foreign language, you need to know clearly what is meant by knowing a word. Most people think that knowing a word means knowing its meaning and form. i.e. these two facets are what comprise word knowledge (Cook, 2008). However, the potential knowledge that can be known about a word is rich and complex. In this respect, different researchers give different ideas about the properties of word knowledge.

Randall (2007) said that knowing a word means that the learner knows:

- How to pronounce it,
- How to use it in a sentence,
- How to add and subtract parts of it to form new words,
- Its meaning.

According to him, knowing these four aspects reflects knowing four types of knowledge which are: phonological, syntactic, morphological and semantic knowledge.

![Diagram showing the types of knowledge involved in knowing a word](image)

**Figure 1.1:** The Types of Knowledge Involved in Knowing a Word (Randall, 2007, p.102)
1.1.3 Types of Vocabulary

There are two types of vocabulary, namely: productive and receptive vocabulary.

1.1.3.1 Productive and Receptive Vocabulary

Productive vocabulary indicates that the student can correctly understand, pronounce and use the word while writing or speaking. However, receptive vocabulary indicates that s/he can recognize its spoken or written form while listening or reading. Hiebert and Kamil (2005) stated that:

*Productive vocabulary* is the set of words that an individual can use when writing or speaking. They are words that are well-known, familiar, and used frequently. Conversely, *receptive, or recognition, vocabulary* is that set of words for which an individual can assign meanings when listening or reading. (p.3)

Another distinction between this dichotomy has been made by Palmer (1921) who pointed out that productive vocabulary carries the idea that we produce language forms by speaking and writing to convey messages to others and receptive vocabulary carries the idea that we receive language from others through listening or reading and try to comprehend it. Finally, productive vocabulary and receptive vocabulary are respectively labeled by Aebersold and Field (1977) as active vocabulary and passive vocabulary.

1.1.4 Vocabulary Learning Strategies (VLSs)

Under this heading, definition and classification of vocabulary learning strategies are going to be tackled:
1.1.4.1 Definition of Vocabulary Learning Strategies

Nation (2001) argued that learning strategies include vocabulary learning strategies by stating that “vocabulary learning strategies are a part of language learning strategies which in turn are a part of general learning strategies” (p. 217). Moreover, O’malley and Chamot (1990) believed that vocabulary learning strategies are “the special thoughts or behaviors that individuals use to help them comprehend, learn, or retain new information” (p.1). That is to say, they are considered as helpful tools used by learners during the learning process in order to facilitate and improve vocabulary learning. Another definition concerning VLSs has been proposed by Cohen (1990) who stated that they are “Processes which are consciously selected by learners and which may result in action taken to enhance the learning or use of a second or foreign language through the storage, retention, recall and application of information about that language” (p.4). In other words, VLSs are techniques, devices or tools which are intentionally employed by learners to facilitate their vocabulary learning. Finally, Takac (2008) defined vocabulary learning strategies as “specific strategies utilized in the isolated task of learning vocabulary in the target language” (p.52). That is to say, there are different strategies for different tasks of learning the different aspects of the target language.

Importantly, this study tackles the classification suggested by Schmitt (2000). The reason behind choosing the taxonomy proposed by Schmitt is that: his taxonomy is more specific and related to vocabulary.
1.1.4.2 Schmitt’s Classification of Vocabulary Learning Strategies

VLSs that learners employ while learning vocabulary have received recognition from educators and researchers since the 1970’s. Consequently, these strategies have been categorized differently by various researchers (Bialystok, 1981; Ellis, 1994; Gu, 1995; Nation, 2001; O’Malley et al., 1985; Oxford, 1990; Stern, 1992; Stoffer, 2003; Willing, 1988).


1.1.4.2.1 Discovery Strategies

They are strategies learners use to determine the meaning of the words they meet for the first time. This category is subdivided into two groups, namely: determination and social strategies

1.1.4.2.1.1 Determination Strategies (DET)

They are defined by Schmitt (2000) as “strategies used by an individual when faced with discovering a new word’s meaning without recourse to another person’s expertise” (p.135) i.e. they allow learners to determine and discover the word’s meaning when encountered for the first time, independently. Hence, learners try to discover the meaning of new words by guessing them from context, using dictionary and guessing from L1 cognate.

1.1.4.2.1.2 Social Strategies (SOC)

Schmitt (2000) includes these strategies in both categories (discovery and consolidating strategies) because they can be used for both purposes. They involve
asking teachers or classmates in order to get the meaning of unfamiliar words. In other words, they involve learning new words through interaction.

1.1.4.2.2 Consolidation Strategies

They are strategies learners use to memorize and remember the word once it has been taught or encountered. This category is also subdivided into social, memory, cognitive and metacognitive strategies.

1.1.4.2.2.1 Memory Strategies (MEM)

According to Schmitt (2000), they are strategies which involve making connection between the new word and some previously personal experiences or learned knowledge. This connection is helpful for the process of memorization since it allows learners to remember some forms of imagery via studying new words with pictures of meanings or grouping words according to their categories: synonyms and antonyms or writing new words in sentences.

1.1.4.2.2.2 Cognitive Strategies (COG)

They primarily refer to written and verbal repetition as well as using mechanical means to study vocabulary.

1.1.4.2.2.3 Metacognitive Strategies (MET)

They are defined by Schmitt (2000) as strategies that:

Involve a conscious overview of the learning process and making decisions about planning, monitoring, or evaluating the best ways to study. This includes improving access to input, deciding on the most efficient methods of study, review,
and testing one-self to language improvement. It also includes deciding which words are worth one chooses to learn. (p.136)

That is to say, they are strategies which involve planning for learning, thinking about the learning process as it is taking place, correcting your own mistakes and self-evaluation of both learning and strategies that have been used. Thus, learners will take more responsibility to improve their learning once they test themselves. According to Schmitt (1997) testing oneself is an instance of metacognitive strategies, and it provides “input to the effectiveness of one’s choice of learning strategies, providing positive reinforcement if progress is being made or a signal to switch strategies if it is not” (p.216). The following table illustrates the complete classification scheme proposed by Schmitt (2000):

Table 1.1: Schmitt’s Classification of Vocabulary Learning Strategies (Schmitt, 2000, p.134)

<table>
<thead>
<tr>
<th>Strategies for the discovery of a new word’s meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>DET Analyze part of speech</td>
</tr>
<tr>
<td>DET Analyze affixes and roots</td>
</tr>
<tr>
<td>DET Check for L1 cognate</td>
</tr>
<tr>
<td>DET Analyze any available pictures or gestures</td>
</tr>
<tr>
<td>DET Guess meaning from textual context</td>
</tr>
<tr>
<td>DET Use a dictionary (bilingual or monolingual)</td>
</tr>
<tr>
<td>SOC Ask teacher for a synonym, paraphrase, or L1 translation of new word</td>
</tr>
<tr>
<td>SOC Ask classmates for meaning</td>
</tr>
</tbody>
</table>

Strategies for consolidating a word once it has been encountered

| SOC Study and practice meaning in a group |

13
### The Importance of Vocabulary in EFL Classrooms

Vocabulary learning is an essential component that needs a careful attention on the part of both teachers and students because it is considered as a key for success while
mastering the target language and without it learning will not occur. This idea was supported by Krashen and Terrell (n.d, as cited in Aksunger, 2000) who stated that “acquisition will not take place without comprehension of vocabulary” (p.170). Swan and Walter (1984, as cited in Thornbury, 2002) argued that “vocabulary acquisition is the largest and most important task facing the language learner” (p.14). Besides, it was believed that the one who has a rich repertoire of vocabulary can express his / her thoughts and ideas more effectively because knowing grammar alone cannot serve this function. Harmer (1991, as cited in Mirkamali, Maghsoudiand & Azizmohammadi, 2013) supported this idea by saying “if language structures make up the skeleton of language, then it is vocabulary that provides the vital organs and the flesh. An ability to manipulate grammatical structures does not have any potential for expressing meanings unless words are used” (p. 53). Moreover, it is believed that successful communication can be achieved when students know a lot of words. In this respect, McCarthy (1991) stated that:

No matter how well the student learns grammar, no matter how successfully the sounds of L2 are mastered, without words to express a wide range of meanings, communication in L2 cannot happen in any meaningful way. And yet vocabulary often seems to be the least systematized and the least well catered for all aspects of leaning a foreign language. (p. 1)

Tabatabaei and Houssainzadeh (2011) emphasized the same idea by saying that to be able to communicate well in any foreign language, students are obliged to know a sufficient number of words and be familiar with how to use them correctly. Furthermore, Rubin and Thompson (1994) argued that “one cannot speak, understand, read or write a foreign language without knowing a lot of words; therefore,
vocabulary learning is at the heart of mastering a foreign language” (p.79). Finally, Edger (1999) pointed out that “developing students’ vocabulary skills correlates with success in all areas of curriculum” (p. 9).

To sum up, knowing the vocabulary of the target language serves as the platform that enables EFL learners to develop the four skills of language, namely: speaking, listening, writing and reading.

1.1.6 The Process of Memorization

According to Takac (2008), “The role of memory is crucial in any kind of learning and vocabulary is no exception” (p.10). That is to say, memory is an essential component in learning foreign language in general and in learning vocabulary in particular. The importance of memory has been highlighted because it is considered as “the mental processes of acquiring and retaining information for later retrieval” (Ashcraft, 1994, as cited in Mendonça, 2003, p.15). In other words, it is a process that enables learners to store what have been exposed to during the learning phase in order to be remembered and used whenever is needed.

Atkinson and Shiffrin (1968, as cited in Randall, 2007) argued that the knowledge that learners are exposed to while learning is stored in the memory and it is transferred and processed through three stages, namely: Sensory Memory, Short-Term Memory (STM) and Long- Term Memory (LTM).
Randall (2007) argued that at the first stage a limited amount of information can be stored. This information is perceived from the outside world through our senses, such as: auditory information (sounds) or visual information (images). These stimuli can be transferred to the next stage via the help of attention. The second stage is considered as a mediator between sensory memory and long-term memory (Baddeley, 2006). This kind of memory can treat only a limited amount of information for a limited amount of time. This idea has been supported by Schmitt (2002) who stated that “Short-term memory is used to store or hold information while it is being processed. It normally can hold information for only a matter of seconds” (p.131). The length of time in which information remains in short-term memory depends on whether it undergoes rehearsal or not. That is to say, the more an item is rehearsed, the more it is transferred to long-term memory.

Craik and Lokhart (1972) pointed out that there are two types of rehearsal which are: ‘Elaborative Rehearsal’ and ‘Maintenance Rehearsal’. The former involves deep processing which will lead to long-term memory. However, maintenance rehearsal involves rote repetition. Moreover, the last stage has a large information capacity and it is capable for storing information for a very long period of time. It involves **Encoding** (i.e. putting items into the store) as well as **Decoding** (i.e. retrieving items...
from the store). Furthermore, when the knowledge enters to long-term memory, it can be stored in the declarative memory or procedural one. The former is composed of two types, namely: semantic memory which contains all what we have learned throughout our lives and episodic memory which stores information about our personal experiences (Tulving & Thomson, 1973). Whereas, the procedural memory stores the automatic procedures involved in skilled behaviours.

Each stage is believed to have four characteristics which are: capacity, trace duration, the code in which information is stored and at last the control process supposed for each store. It is believed that information is processed in the same manner and through the same steps in the three kinds of memory i.e. at each level there is encoding, storage and retrieval. The first one refers to the operation of transforming a perceived physical or sensory input into a kind of simple representation that can be inserted into memory. The second step (storage) refers to the process of retention of the encoded information in memory. The third step (retrieval) refers to how stored information is retrieved to be re-used (Atkinson & Shiffrin, 1971).

1.1.7 Vocabulary Memorization

Since vocabulary is a matter of remembering, it is important to understand how memory works, how words are stored and how words are remembered. This understanding helps EFL students to follow effective ways to memorize English vocabulary so that it can be easily remembered. In order to ensure that new words enter to long-term memory, students have to follow such principles as described by Thornbury (2002):
• Repetition: when repeating the word several times, students will have the opportunity to remember it for a long time.

• Retrieval: it means to make students engage in activities that involve using the new words in written tasks. This step will help students recall the words whenever is needed in the future.

• Spacing: it is about presenting new items over period of time rather than presenting them all together in a single time.

• Use: it is considered as the best way that ensures entering new words to long-term memory. It is also called ‘use it or lose it’.

• Cognitive depth: it involves students to make decisions about the word. The more cognitively decisions are made the better the word is remembered.

• Personal organizing: it can be achieved through role-playing activities and conversation.

• Imaging: presenting new words using pictures will help learners remember them better than those presented without pictures.

• Mnemonics: when using visuals and keyword techniques, this will help students to retrieve items and rules that are stored in the memory.

• Motivation and attention: they also ensure that words will be remembered (p.24-25).

Conclusion

Having a limited repertoire of vocabulary is considered as a barrier that prevents students from learning a foreign language. For this reason, both teachers and students should be aware of its importance by devoting a careful attention to the task of vocabulary learning as well as by adopting helpful strategies that enable students to
learn and memorize the vocabulary that is presented in their textbooks so that it can be easily remembered whenever is needed.

One of the strategies adopted to develop EFL learner’s vocabulary memorization is ‘sentence writing strategy’ which will be tackled in the next section of this chapter.
Chapter One: Theoretical Background

Section Two: Sentence Writing Strategy

Introduction

1.2.1 The Nature of Sentence Writing Strategy

1.2.2 The Task of Sentence Writing

   1.2.2.1 Sentence Writing as a Deep Processing Activity

   1.2.2.2 Sentence Writing as a Generative Activity

   1.2.2.3 Sentence Writing as an Output Activity

1.2.3 The Effectiveness of Using Sentence Writing Strategy on Developing Vocabulary Memorization

   1.2.3.1 Positive Effect of Sentence Writing Strategy

   1.2.3.2 Negative Effect of Sentence Writing Strategy

Conclusion
Introduction

Being aware of the importance of vocabulary in learning a foreign or second language makes teachers carefully adopt and use effective memorization strategies. In fact, there are many strategies through which vocabulary can be taught and learned. One strategy that can be implemented for teaching vocabulary is sentence writing strategy.

Interestingly, this section tackles the nature of sentence writing strategy, the task of sentence writing as well as it presents the positive and negative effects of sentence writing strategy on vocabulary memorization.

1.2.1 The Nature of Sentence Writing Strategy

Sentence writing strategy is considered as a vocabulary teaching strategy which refers to everything teachers do or should do in order to help learners learn the target vocabulary (Hatch & Brown, 2000). More specifically, it is used by the teacher after s/he presents both the meaning and form of the new words in order to get learners to review the vocabulary items and to consolidate them in long-term memory. According to Takac (2008), “the teacher’s task is to provide learners with opportunities for practising and connecting words in various ways and to stimulate them to retrieve words from memory and use them for all language skills” (p.21). In addition, this strategy belongs to the category of activities known as ‘productive use of words’. These activities are proposed by teachers to engage their students to use the target words in a meaningful context. By doing this, students will create mental links which are helpful for the process of memorization.
This strategy is also considered as a vocabulary learning strategy used to enhance the role of the individual learner in vocabulary learning as well as it refers to “the effort invested by learners in vocabulary learning” (Takac, 2008, p. 24). In other words, this strategy is extremely important because it enables learners to control their own learning by being responsible of expanding their vocabulary repertoire whether inside or outside classrooms. Furthermore, Schmitt (1997) argued that using new words in sentences is a memory strategy used by learners to consolidate the words once it has been encountered in order to guarantee long-term vocabulary retention.

1.2.2 The Task of Sentence Writing

In order to understand the relationship between sentence writing and tasks that involve deep processing, generation or output, the following points are introduced:

1.2.2.1 Sentence Writing as a Deep Processing Activity

Sentence writing is a kind of tasks that involve deep processing because it encourages learners to engage in deeper levels of processing. Besides, sentence writing, as a deep processing activity, refers to “any elaborative semantic and syntactic focus deployed to assist learners in understanding, recalling, and reconceptualizing words for use in new contexts” (Borer, 2007, p.276). That is to say, when the learner writes the sentence, s/he will think about whether the target word s/he has used in a sentence is correct both semantically and grammatically. By doing this, it is worth to mention that the learner is making a cognitive effort and “the more cognitive effort is required when one learns a new word, the better the word is remembered” (Thornbury, 2002, p.25). Furthermore, Craik and Lockhart (1972) believed that tasks as sentence writing which involve deeper processing or deeper
cognitive processing will bring deeper memory trace. In other words, knowledge can be memorized only if it goes through deeper cognitive processing.

1.2.2.2 Sentence Writing as a Generative Activity

Sentence writing is considered as a generative task because it requires learners to generate original sentences containing the new vocabulary items (Swain, 1996). Besides, when the learner uses the target word to compose a sentence, the semantic connection between the target word and the whole sentence will be generated. That is to say, while using the target word to write a sentence, the learner will think about how to use the word in the sentence as well as how to combine the target word with the other words in the sentence.

According to Wittrock (1974, as cited in Yu, 2011), generative tasks as sentence writing can promote vocabulary memorization by integrating the new words with the old ones. This integration involves relating the new word to be memorized with some previously learned or existing knowledge as: previous experiences or known words because when new information is connected to information that already exists, it is enriched and makes more robust memory trace (Craik & Tulving, 1975). In other words, the more new words are related to pre-existing words, the more it will be memorized. For this purpose, generative tasks are important for the memorization of new words.

1.2.2.3 Sentence Writing as an Output Activity

Sentence writing is an output practice which requires production on the part of the learner; this production can help learners to learn second language vocabulary. This idea was defended by Kitajima (2001) who pointed out that vocabulary learned by an output as sentence writing will get longer retention. Besides, sentence writing, as an output task, can promote acquisition of the form (spelling) and meaning of the target
words because when the learner creates sentences, s/he must pay attention to the form and meaning of the target words. Moreover, there are two types of output: output with access and output without access to meaning (Barcroft, 2006). Output with access to meaning refers to “activating the lexical items and grammatical forms necessary to express particular meanings” (Vanpatten, 2003, p.63). Output without access to meaning involves language production which does not require this type of activation, such as: the task of repeating words without intending to convey messages.

According to Swain (1985), output may help learners by requiring them to move away from relying on top-down processing strategies and contextual clues used during comprehension towards relying on specific means of expressions and syntax needed to produce language. In other words, production provides the opportunity for both noticing the linguistic forms and meaningful practice. Finally, Barcroft (2006) believed that it is better to encourage learners to write their own sentences rather than forcing them.

### 1.2.3 The Effectiveness of Using Sentence Writing Strategy on Developing Vocabulary Memorization

Previous researches have led to different conclusions concerning the effectiveness of sentence writing as a vocabulary memorization strategy. Some researchers found that sentence writing is an effective strategy for facilitating memorization of words. Whereas, others found that this strategy has a negative effect on memorizing the target vocabulary.
1.2.3.1 Positive Effect of Sentence Writing Strategy

Researchers as (Coomber, Ramstad, & Sheets, 1986; Talebzadeh & Bagheri, 2012; Yu, 2011) argued that using sentence writing strategy as a teaching strategy to develop students’ vocabulary memorization was effective.

Firstly, Coomber, Ramstad and Sheets (1986) examined the effects of three types of semantic rehearsal methods (definitions, examples and sentence composing) on short-term vocabulary learning. They hypothesized that the more successfully students would retrieve those definitions on a memory test is based on the more deeply words and their definitions were processed. Besides, they argued that definitions would require the least processing and using examples would require more processing. While, sentence-composing, as a generative activity, would require the most processing. The results showed positive effects for sentence composing. Coomber et al. (1986) found writing target words in sentences to be highly effective in developing the memorization of the target words and their definitions, and they attributed this effectiveness to three factors. The first factor is the use of the words in meaningful contexts. The second factor is the students’ utilization of their higher level cognitive functions. The third factor has to do with the nature of the writing process which is characterized as being slow, and this will allow students to have more time to elaborate the lexical items.

Secondly, Yu (2011) investigated which of the two vocabulary learning methods (word list or sentence writing) best promote long-term vocabulary memorization. Sixteen primary school ESL learners took part in his experiment, and they were randomly assigned to two groups in which each group comprised eight pupils. The first group was required to learn words written in the list without writing sentences. The second group was required to write sentences using the target words. After
analyzing the data gathered, results showed that learning by word lists is effective in the short-term memory, and for specific purposes such as passing a test and sentence writing has greater benefits in the long-term memory. According to Yu (2011), the reason behind this efficacy is that deep processing and elaborative rehearsal involved when writing sentences are more likely to lead to long-term memory. Thus, memorizing the meaning and spelling of the target words by sentence writing strategy is highly effective.

Finally, Talebzadeh and Bagheri (2012) conducted an experiment in order to investigate the effect of sentence making on the vocabulary learning of pre-intermediate EFL students in Shiraz, Iran. Thirty-four participants were taught 60 new words for 6 sessions i.e. 10 new vocabulary items per-session and they were asked in the next session to write the previously learned vocabulary items in sentences. The analysis of data showed that sentence making has a positive effect on vocabulary learning. In order to support the statistical results of the study, the researcher conducted an interview with the participants in order to show the degree of agreement or disagreement of the participants with the effectiveness of the assignment (sentence writing). 87% of the participants agreed that the sentence making assignment helped them improve their vocabulary learning. So, most of them believed that it was an effective assignment. For Talebzadeh and Bagheri, the reason of this effectiveness is that writing anything to be learned helps students practice the material and store it in a long-term memory.
1.2.3.2 Negative Effect of Sentence Writing Strategy

Some previous studies (Barcroft, 2004; Folse, 2006) revealed that using sentence writing strategy as a teaching strategy to develop students’ vocabulary memorization was not effective.

Barcroft (2004) conducted two experiments through which he compared the effect of writing new words in sentences with word-picture repetition on L2 Spanish students’ vocabulary learning. Participants were studying in four different course sections at the University of Illinois at Urbana-Champaign. In the first experiment, 22 participants in the no sentence writing condition (i.e. word-picture repetition) attempted to learn 12 concrete Spanish nouns in which they viewed 4 repetitions of each word for 6 seconds but in the sentence writing condition, 22 participants attempted to learn 12 concrete Spanish nouns in which they viewed 1 repetition of each word for 48 seconds and after that they were asked to write the word in a Spanish sentence. Besides, in the second experiment, the same participants were shown one repetition of each word for 24 seconds (i.e. the same representation format) in both the sentence writing and no sentence writing conditions. In doing so, experiment 2 tested whether the results obtained in experiment 1 could have been due to differences in number of repetitions. From both experiments, results indicated strong negative effects for the sentence writing conditions, suggesting that sentence writing can inhibit word form learning during the initial stages of L2 vocabulary acquisition.

Folse (2006) compared the effect of written exercises on L2 vocabulary retention. For this purpose, 154 ESL learners of four U.S universities practised 18 unknown words following three different types of conditions: one fill-in-the-blank exercises...
(recognition exercises), three fill-in-the-blank exercises (recognition exercises), and one original-sentence writing exercises (production exercises). Based on the performance of students, it was argued that sentence writing was not effective for L2 vocabulary memorization. Folse (2006) indicated that how frequently students retrieved unfamiliar words influenced their retention more than how deeply they were involved in processing them. This demonstrated that students could improve their retention of new target words more while engaging in multiple fill-in-the blank exercises than while writing one original sentence with each target word.

**Conclusion**

Foreign language students and teachers can overcome the challenging task of vocabulary memorization by adopting sentence writing strategy. Importantly, for the sake of investigating the impact of sentence writing strategy on EFL learners’ vocabulary memorization in the Algerian context, a quasi-experimental study was conducted; this is what will be tackled in the next chapter.
CHAPTER TWO

PRACTICAL FRAMEWORK

(ANALYSIS AND DISCUSSION OF THE RESULTS)
CHAPTER TWO:  
PRACTICAL FRAMEWORK (ANALYSIS AND  
DISCUSSION OF THE RESULTS)  

Introduction  

2.1 The Choice of the Method  

2.2 The Sample  

2.3 The Research Design  

2.4 Procedures  

2.4.1 Pre- testing  

2.4.2 Treatment  

2.4.2.1 Experimental Group Instruction  

2.4.2.2 Control Group Instruction  

2.4.3 Post- testing  

2.5 Instruments  

2.5.1 Test Used in Pre and Post- tests (Matching task)  

2.6 Scoring  

2.7 Statistical Analysis  

2.8 Results  

2.8.1 Results of the Vocabulary Matching Task
2.8.2 Control Group versus Experimental Group Scores on the Pre-test

2.8.2.1 The Independent-Samples t-test

2.8.3 Control Group Post-test versus Control Group Pre-test

2.8.3.1 The Paired-Samples t-test of the Control Group

2.8.3.2 Procedures for Carrying out a Paired-Samples t-test

2.8.4 Experimental Group Post-test versus Experimental Group Pre-test

2.8.4.1 The Paired-Samples t-test of the Experimental Group

2.8.5 Control Group versus Experimental Group on the Post-test

2.8.5.1 The Independent-Samples t-test

**General Discussion**

**GENERAL CONCLUSION**
Introduction

Vocabulary learning is considered as the student’s main package to master the foreign language. Due to its importance, many strategies have been suggested in order to facilitate the task of vocabulary memorization. Among these strategies, there is what is known as ‘sentence writing’ strategy. More specifically, this research has been conducted in order to find out whether this strategy has a positive effect on developing the vocabulary memorization of first year students of Mobarek El- Mili Secondary School in Ain Babouche, Oum El-Bouaghi.

This chapter is devoted to the description of the experimental study. That is to say, it presents the choice of the method, the sample, the research design, data collection procedures that include: pre-test, treatment and post-test, instruments, scoring and the statistical analysis of the data.

2.1 The Choice of the Method

In order to achieve the research purpose, an experimental method with a quasi-experimental design is adopted. This choice is based on the nature of the topic which is investigating the cause-effect relationship between the independent and dependent variables.

2.2 The Sample

The target population of the present study comprised 163 students studying first year (scientific stream) at Mobarek El- Mili Secondary School in Ain Babouche for the academic year 2014-2015. The sample of the present study consisted of 73 students (28 females and 45 males). Two pre-existing groups have been randomly
selected to represent the experimental and control groups. The former included 37 students and the latter included 36 students. They were of different age, gender, cultural background and intellectual abilities.

This grade has been selected because it is the only one available for conducting the experiment on. Despite this, it is worth to mention that they are assumed to be motivated to learn new vocabulary since they are moving from middle to secondary level.

2.3 The Research Design

The current study addresses the following question:

Does sentence writing strategy have any effect on developing students’ vocabulary memorization?

Statistically speaking, this study attempts to answer the following question:

Is there a significant difference in vocabulary memorization between students who learn vocabulary through sentence writing strategy and those who do not?

To answer this question, the following hypothesis is formulated:

\( H_1 \): There would be a significant difference in vocabulary memorization between students who learn vocabulary through sentence writing strategy and those who do not.
The null hypothesis is formulated as following:

\( H_0 \): There would be no significant difference in vocabulary memorization between students who learn vocabulary through sentence writing strategy and those who do not.

Furthermore, this research is composed of two variables: the independent variable (sentence writing strategy) and the dependent variable (vocabulary memorization).

The design of this study includes three phases: pre-test, treatment and post-test. The schematic representation of the quasi-experimental design is as follow:

<table>
<thead>
<tr>
<th>Experimental Group</th>
<th>Pre-test</th>
<th>Treatment 1</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>Pre-test</td>
<td>Treatment 2</td>
<td>Post-test</td>
</tr>
</tbody>
</table>

Table 2.1: The Interpretation of the Research Design’s Schematic Representation

<table>
<thead>
<tr>
<th>Element</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>It consisted of 26 students.</td>
</tr>
<tr>
<td>Control group</td>
<td>It consisted of 21 students.</td>
</tr>
<tr>
<td>Pre-test</td>
<td>It included just one vocabulary matching task which contained twelve new words in order to be matched to their definitions.</td>
</tr>
<tr>
<td>Treatment 1</td>
<td>It was in the form of teaching vocabulary through sentence writing strategy.</td>
</tr>
<tr>
<td>Treatment 2</td>
<td>It was about teaching vocabulary through presenting the target words and their definitions in a form of word lists (traditional method).</td>
</tr>
<tr>
<td>Post-test</td>
<td>It was the same task used in the pre-test.</td>
</tr>
</tbody>
</table>

2.4 Procedures

What has been done during the experiment, in order to accomplish the target aim, is to be mentioned in this section.
2.4.1 Pre-testing

Before carrying the treatment, students received a pre-test. This test included just one vocabulary matching task which contained twelve new words in order to be matched to their appropriate definitions. The target words were related to the unit of ‘Back to nature’. The test took 20 minutes and before giving it to students, they were informed that their scores on the test would not affect their scores on the examination; therefore, they had to work individually and give answers which they believed were correct (Appendix A).

2.4.2 Treatment

The treatment started from the second session and it extended over four sessions. During these sessions, the two groups received the same content but using different methods. They received nineteen new words (11 nouns, 6 verbs, and 2 adjectives) which were related to the unit of ‘Back to nature’. The experimental group was taught by the researcher for 45 minutes and the control group was taught by the teacher for 15 minutes.

2.4.2.1 Experimental Group Instruction

Students in this group were taught vocabulary with the integration of sentence writing strategy throughout four sessions. During each session, students received five definition sheets except in the fourth session they received just four sheets. Each sheet contained one new word accompanied with its dictionary definition. The new words were explained separately by the researcher and after each explanation, students were asked to write their own sentences. Because they were given five words per session,
they were asked to write five sentences containing the five learned words (See appendix B1, B2, B3, B4).

2.4.2.2 Control Group Instruction

Students of this group were taught vocabulary through word list; the ordinary method applied by their teacher. They were taught five words per session, except in the fourth session they were taught four words. These words were presented in the form of list which contained the new words on the left and their definitions on the right. The new words were explained by the teacher (See appendix B1, B2, B3, B4).

2.4.2.3 Post-testing

After a week from finishing the treatment period, the same test was given to both experimental and control groups. It was administered under the same conditions surrounding the pre-test in order to see whether there was a significant improvement in the experimental group performance after the adaption of sentence writing strategy.

2.5 Instruments

In the present study, just one tool was used. This tool, which was a vocabulary matching task, was used because it was considered as the best way to assess the vocabulary memorization of first year students.

2.5.1 Test used in Pre-test and Post-test

To collect the data required, the same test was administered to both groups before the beginning of treatment as well as at the end of treatment period i.e. after four sessions (Appendices A and D). The test was made up of one vocabulary matching task. This task contained twelve different words in order to be matched to their
definitions. These words have been selected from the unit to be taught. Participants were asked to work individually to ensure the efficacy of sentence writing strategy.

2.6 Scoring

The total score of the test was twelve (12) points. Each answer was scored on 0 up to 1 point. In the sense that, no point was given to the wrong matching and one point was given to the correct matching.

2.7 Statistical Analysis

In order to compare the results of the experimental and control groups on the pre and post-tests, two parametric tests were used. The first test is known as t-test for independent samples and the second one is called the paired-samples t-test. The former is used to find out any significant differences between the pre-test scores of the experimental and control groups before the treatment phase and it is also used to find out any significant differences between the post-test scores of both groups after the treatment period (Park, 2009). Whereas, the paired-samples t-test is about comparing the results of the same group before and after the treatment period in order to see whether there is a significant improvement from pre to post-test scores or not (Bower, 2000).

The analysis of the data gathered will be presented in details in the following section.

2.8 Results

The statistical analysis of the current study is presented in this section. It begins with revealing the scores of the vocabulary matching task used in both pre and post-tests and it ends with research findings’ discussion.
2.8.1 Results of the Vocabulary Matching Task

What is obtained from both pre and post-tests is going to be presented.

**Table 2.2:** The Frequency of the Experimental and Control Groups’ Scores on the Vocabulary Matching Task

<table>
<thead>
<tr>
<th>Scores</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test</td>
<td>Post-test</td>
</tr>
<tr>
<td></td>
<td>Frequency</td>
<td>Frequency</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

2.8.2 Control Group versus Experimental Group Scores on the Pre-test

In order to compare the results, the means of the pre-test for both groups should be calculated:

**Experimental group:**

\[
\bar{X} = \frac{\sum x}{N} = \frac{96}{26} = 3.69
\]

**Control group:**

\[
\bar{X} = \frac{\sum x}{N} = \frac{83}{21} = 3.95
\]

When comparing the means (\(\bar{X}\)), it was noticeable that the control group with a mean \(\bar{X} = 3.95\) outscored the experimental group with a mean \(\bar{X} = 3.69\)
For the total 47 scores, we have:

**Control Group:**
\[ 4 \geq 6 \rightarrow 19.05 \% \geq 6 \]
\[ 17 < 6 \rightarrow 80.95 \% < 6 \]

**Experimental Group:**
\[ 4 \geq 6 \rightarrow 15.38 \% \geq 6 \]
\[ 22 < 6 \rightarrow 84.62 \% < 6 \]

*Frequency polygon 1*: The Frequency of Experimental and Control Group Scores on the Pre-test

Table 3 and frequency polygon 1 show that both control and experimental groups’ polygon starts at 1 (the lowest score) and ends at 9 (the highest score). Besides, the most frequent score in the control group is 3. However, the experimental group most frequent score is 2. Moreover, both control and experimental groups’ most frequent scores are bounded by 2 and 3.

In order to examine whether the control and experimental groups are similar i.e. whether they have the same level or not, t-test for independent groups is conducted.
2.8.2.1 The Independent-Samples t-test

According to Dress (2007), when calculating the t-test for independent groups, the following steps should be followed:

1. Arranging students of both experimental and control groups pre-test scores in a statistical table.
2. Calculating the mean of the control and the experimental groups.
3. Calculating the sample variance of each group.
4. Calculating the t-test value for independent groups.
5. Checking if t is statistically significant on the probability table with degree of freedom (df=$N_1 + N_2 - 2$) and probability p = 0.01.
6. Comparing the observed t-value ($t_{observed}$) with the critical t-value ($t_{critical}$).

6.1. If $t_{observed} > t_{critical}$; the null hypothesis is rejected, i.e. there is a significant difference between the experimental and control groups

6.2. If $t_{observed} < t_{critical}$; the null hypothesis is accepted i.e. there is no a significant difference between the two groups.
Table 2.3: Square Pre-test Scores of Both Groups on the Matching Task

<table>
<thead>
<tr>
<th>Students</th>
<th>Experimental group’s scores $X_1$</th>
<th>Square scores $X_1^2$</th>
<th>Control group’s scores $X_2$</th>
<th>Square Scores $X_2^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>03</td>
<td>09</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>02</td>
<td>03</td>
<td>09</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>03</td>
<td>03</td>
<td>09</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>04</td>
<td>02</td>
<td>04</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>05</td>
<td>01</td>
<td>01</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>06</td>
<td>06</td>
<td>36</td>
<td>08</td>
<td>64</td>
</tr>
<tr>
<td>07</td>
<td>04</td>
<td>16</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>08</td>
<td>05</td>
<td>25</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>09</td>
<td>09</td>
<td>81</td>
<td>09</td>
<td>81</td>
</tr>
<tr>
<td>10</td>
<td>02</td>
<td>04</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>11</td>
<td>05</td>
<td>25</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>12</td>
<td>05</td>
<td>25</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>13</td>
<td>09</td>
<td>81</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>14</td>
<td>02</td>
<td>04</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>02</td>
<td>04</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>16</td>
<td>06</td>
<td>36</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>02</td>
<td>04</td>
<td>06</td>
<td>36</td>
</tr>
<tr>
<td>18</td>
<td>03</td>
<td>09</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>19</td>
<td>02</td>
<td>04</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>20</td>
<td>03</td>
<td>09</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>21</td>
<td>03</td>
<td>09</td>
<td>06</td>
<td>36</td>
</tr>
<tr>
<td>22</td>
<td>04</td>
<td>16</td>
<td>$\sum X_2 = 83$</td>
<td>$\sum X_2^2 = 411$</td>
</tr>
<tr>
<td>23</td>
<td>02</td>
<td>04</td>
<td>$\bar{X} = 3.95$</td>
<td>---</td>
</tr>
<tr>
<td>24</td>
<td>03</td>
<td>09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>05</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>02</td>
<td>04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\sum X_1 = 96$</td>
<td>$\sum X_1^2 = 462$</td>
<td>$\sum X_2 = 83$</td>
<td>$\sum X_2^2 = 411$</td>
<td></td>
</tr>
<tr>
<td>$\bar{X}_1 = \frac{\sum X_1}{N_1} = \frac{96}{26} = 3.69$</td>
<td>$\bar{X}_2 = \frac{\sum X_2}{N_2} = \frac{83}{21} = 3.95$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Mean

Experimental Group

Control Group

$\sum X_1 = 96$  

$\sum X_2 = 83$

$\sum X_1^2 = 462$  

$\sum X_2^2 = 411$

$\bar{X}_1 = \frac{\sum X_1}{N_1} = \frac{96}{26} = 3.69$  

$\bar{X}_2 = \frac{\sum X_2}{N_2} = \frac{83}{21} = 3.95$
The Sample Variance

\[ S_1^2 = \frac{\sum X_i^2}{N_1} - \overline{X}_1^2 \]
\[ S_2^2 = \frac{\sum X_i^2}{N_2} - \overline{X}_2^2 \]
\[ = \frac{462}{26} - (3.69 \times 3.69) \]
\[ = \frac{411}{21} - (3.95 \times 3.95) \]
\[ = 17.77 - 13.62 = 4.15 \]
\[ = 19.57 - 15.60 = 3.97 \]

The t-test

The following formula is used for calculating the t-test:

\[ t_{N_1+N_2-2} = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{(N_1 + N_2 - 2)N_1N_2}} \]
\[ \sqrt{(N_1S_1^2 + N_2S_2^2)(N_1 + N_2)} \]

- \( X_{x} \) = individual score
- \( \overline{X}_n \) = group mean
- \( X_{x}^2 \) = square score
- \( N_{x} \) = number of subjects
- \( \Sigma X_{x} \) = sum of the individual scores
- \( \Sigma X_{x}^2 \) = sum of square scores
- \( S_{x} \) = sample variance

\[ t_{26+21-2} = \frac{3.69 - 3.95}{\sqrt{(26+21-2)(26+21)}} \]
\[ = 0.26 \times \sqrt{8546} \]
\[ = \frac{-0.26 \times \sqrt{8546}}{\sqrt{107.9 + 83.37}(47)} \]
\[ \frac{-0.26 \times 2457.0}{\sqrt{191.27} \times 47} \]
\[ t_{45} = \frac{-0.26 \times 156.75}{\sqrt{8989.69}} = \frac{-40.76}{94.81} \]

\[ t_{45} = -0.43 \]

When calculating the degree of freedom (\( df = N_1 + N_2 - 2 = 26 + 21 - 2 = 45 \)), which represents a critical t-value (2.69) at the 0.01 level of significance; it is compared with the observed t-value. From comparison, it is clear that the observed t-value is lower than the critical t-value.

\[ t_{observed} < t_{critical} \left( -0.43 < 2.69 \right) \]

This assists that the two groups are similar and there is no difference between them.

### 2.8.3 Control Group Post-test versus Control Group Pre-test

The means of both pre and post-tests should be calculated:

\[
\overline{X} = \frac{\sum x}{N} = \frac{82}{21} = 3.90
\]

\[ \overline{X} = \frac{\sum x}{N} = \frac{83}{21} = 3.95 \]

The control group recorded a pre-test mean \( \overline{X} = 3.95 \) which is higher than the post-test mean \( \overline{X} = 3.90 \)

In order to see whether there is a significant improvement from pre to post-test scores of the control group, a paired-samples t-test is conducted.
2.8.3.1 The Paired-Samples t-test of the Control Group

According to Chen (2005), the paired-samples t-test is used to examine whether the treatment phase has an impact or not on developing vocabulary memorization of the control group.

2.8.3.2 Procedures for Carrying out a Paired-Samples t-test

Dress (2007) argued that when applying the paired-samples t-test, the following procedures should be followed:

1- Arranging the scores in a form of statistical table that contains the difference scores and square difference scores.

2- Calculate the difference between the scores of the pre-test and post-test for each participant by taking into account the distinction between positive (+) and negative (-) difference.

3- Calculate the difference score \( d \), and the square difference \( d^2 \) between both tests.

4- Calculate the mean difference \( \bar{d} \).

5- Calculate the standard deviation of the differences \( S_d \) in order to calculate the standard error of the mean difference \( SE(\bar{d}) = \frac{S_d}{\sqrt{N}} \).

6- Calculate the t-statistic which is given by the formula: \( t = \frac{\bar{d}}{SE(\bar{d})} \). Under the null hypothesis, this statistic follows a t-distribution at N-1 degree of freedom.

7- Using a table of distribution at N-1 degree of freedom to choose the level of significance required (normally \( p = 0.01 \)). Then, read the critical t-value.

8- Compare the \( t_{observed} \) to the \( t_{critical} \).
Table 2.4: The Control Group’s Square Difference Scores on the Vocabulary Matching Task

<table>
<thead>
<tr>
<th>Individual Students</th>
<th>Difference score ( d )</th>
<th>Square difference scores ( d^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>02</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>03</td>
<td>-1</td>
<td>01</td>
</tr>
<tr>
<td>04</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>05</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>06</td>
<td>-5</td>
<td>25</td>
</tr>
<tr>
<td>07</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>08</td>
<td>-2</td>
<td>04</td>
</tr>
<tr>
<td>09</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>10</td>
<td>+3</td>
<td>09</td>
</tr>
<tr>
<td>11</td>
<td>+2</td>
<td>04</td>
</tr>
<tr>
<td>12</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>13</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>14</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>15</td>
<td>-1</td>
<td>01</td>
</tr>
<tr>
<td>16</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>17</td>
<td>-2</td>
<td>04</td>
</tr>
<tr>
<td>18</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>19</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>20</td>
<td>-1</td>
<td>01</td>
</tr>
<tr>
<td>21</td>
<td>-2</td>
<td>04</td>
</tr>
<tr>
<td>Total</td>
<td>( \Sigma d = -1 )</td>
<td>( \Sigma d^2 = 61 )</td>
</tr>
</tbody>
</table>

The Mean Difference (\( \bar{d} \))

\[
\bar{d} = \frac{\Sigma d}{N} \quad \text{where} \quad \bar{d} = \text{mean} \quad \Sigma = \text{sum} \\
\text{d=difference scores} \quad N=\text{number of subjects}
\]

\[
\bar{d} = \frac{-1}{21} = -0.05
\]

The Standard Deviation of the Difference (\( S_d \))

Before calculating the \( S_d \), the variance (\( S \)) should be calculated:

\[
S = \frac{\Sigma d^2}{N} - \bar{d}^2 = \frac{61}{21} - (-0.05)^2 = 2.90 - 0.0025 = 2.9
\]
\[ S_d = \sqrt{\text{var}(S)} = \sqrt{2.9} = 1.70 \]

The Standard Error of the Mean Difference SE (\( \bar{d} \))

\[
\text{SE} (\bar{d}) = \frac{S_d}{\sqrt{N}}
\]

\[
\text{SE} (\bar{d}) = \frac{1.70}{\sqrt{N}} = \frac{1.70}{\sqrt{21}} = \frac{1.70}{4.58}
\]

\[
\text{SE} (\bar{d}) = 0.37
\]

The t-statistic

\[
t_{N-1} = \frac{\bar{d}}{\text{SE}(\bar{d})}
\]

\[
t_{21-1} = \frac{-0.05}{0.37}
\]

\[
t_{20} = -0.14
\]

When calculating the degree of freedom (df = N-1= 21-1= 20), which represents a critical t-value (2.85) at the 0.01 level of significance; it is compared with the observed t-value (-0.14). The comparison indicates that there is no significant improvement between the control group participants’ pre and post-test scores.

\[ t_{\text{observed}} < t_{\text{critical}} (-0.14 < 2.85) \]

Evidently, learning vocabulary through word lists is not effective in improving the learner’s vocabulary memorization.
2.8.4 Experimental Group Post-test versus Experimental Group Pre-test

The means of both pre and post-tests should be calculated:

\[
\bar{X} = \frac{\sum x}{N} = \frac{218}{26} = 8.38, \quad \bar{X} = \frac{\sum x}{N} = \frac{96}{26} = 3.69
\]

The experimental group recorded a post-test mean \( \bar{X} = 8.38 \) which is higher than the pre-test mean \( \bar{X} = 3.69 \)

In order to see whether there is a significant improvement from pre to post-test scores or not, a paired-samples t-test is applied.

2.8.4.1. The Paired-Samples t-test of the Experimental Group

The procedures that have been followed for calculating the control group’s paired-samples t-test are going to be followed for calculating the experimental group’s paired-samples t-test.
Table 2.5: The Experimental Group’s Square Difference Scores on the Vocabulary Matching Task

<table>
<thead>
<tr>
<th>Individual Students</th>
<th>Difference score d</th>
<th>Square difference scores $d^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>+3</td>
<td>09</td>
</tr>
<tr>
<td>02</td>
<td>+7</td>
<td>49</td>
</tr>
<tr>
<td>03</td>
<td>+6</td>
<td>36</td>
</tr>
<tr>
<td>04</td>
<td>+2</td>
<td>04</td>
</tr>
<tr>
<td>05</td>
<td>+5</td>
<td>25</td>
</tr>
<tr>
<td>06</td>
<td>+1</td>
<td>01</td>
</tr>
<tr>
<td>07</td>
<td>+6</td>
<td>36</td>
</tr>
<tr>
<td>08</td>
<td>+2</td>
<td>04</td>
</tr>
<tr>
<td>09</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>10</td>
<td>+8</td>
<td>64</td>
</tr>
<tr>
<td>11</td>
<td>+2</td>
<td>04</td>
</tr>
<tr>
<td>12</td>
<td>-3</td>
<td>09</td>
</tr>
<tr>
<td>13</td>
<td>+3</td>
<td>09</td>
</tr>
<tr>
<td>14</td>
<td>+8</td>
<td>64</td>
</tr>
<tr>
<td>15</td>
<td>+8</td>
<td>64</td>
</tr>
<tr>
<td>16</td>
<td>+3</td>
<td>09</td>
</tr>
<tr>
<td>17</td>
<td>+10</td>
<td>100</td>
</tr>
<tr>
<td>18</td>
<td>+7</td>
<td>49</td>
</tr>
<tr>
<td>19</td>
<td>+3</td>
<td>9</td>
</tr>
<tr>
<td>20</td>
<td>+7</td>
<td>49</td>
</tr>
<tr>
<td>21</td>
<td>+7</td>
<td>49</td>
</tr>
<tr>
<td>22</td>
<td>+6</td>
<td>36</td>
</tr>
<tr>
<td>23</td>
<td>+8</td>
<td>64</td>
</tr>
<tr>
<td>24</td>
<td>+4</td>
<td>16</td>
</tr>
<tr>
<td>25</td>
<td>+3</td>
<td>9</td>
</tr>
<tr>
<td>26</td>
<td>+6</td>
<td>36</td>
</tr>
</tbody>
</table>

$\sum d = 122$  \quad $\sum d^2 = 804$

$d = 4.69$  \quad $d^2 = 30.92$

The Mean Difference ($\bar{d}$)

$$\bar{d} = \frac{\sum d}{N}; \text{ where }\begin{array}{|c|c|}
\hline
\text{d} & \text{mean} \\
\text{d}=\text{difference scores} & \sum = \text{sum} \\
\hline
\text{N= number of subjects} & \hline
\end{array}$$

$$\bar{d} = \frac{122}{26} = 4.69$$

The Standard Deviation of the Difference ($S_d$)

Before calculating the $S_d$, the variance ($S$) should be calculated:
\[ S = \frac{\sum d^2}{N} - \bar{d}^2 = \frac{804}{26} - 4.69^2 = 30.92 - 22.02 = 8.9 \]

\[ S_d = \sqrt{\text{var}(\bar{d})} = \sqrt{8.9} = 2.98 \]

**The Standard Error of the Mean Difference SE (\(\bar{d}\))**

\[ \text{SE} (\bar{d}) = \frac{S_d}{\sqrt{N}} = \frac{2.98}{\sqrt{26}} = \frac{2.98}{5.10} \]

\[ \text{SD} (\bar{d}) = 0.58 \]

**The t-statistic**

\[ t_{N-1} = \frac{\bar{d}}{\text{SE}(\bar{d})} \]

\[ t_{26-1} = \frac{4.69}{0.58} \]

\[ t_{25} = 8.09 \]

Since the total number of the experimental group participants is 26, the degree of freedom (df = N-1) is 25. This degree represents a critical t-value (2.79) at the 0.01 level of significance. It is obvious that the observed (calculated) t-value highly exceeds the critical t-value. The comparison indicates that there is a significant improvement between the experimental group participants’ pre and post-test scores. This improvement was due to the manipulation of the independent variable (sentence writing strategy). Thus, sentence writing strategy is effective in improving students’ vocabulary memorization from pre to post-test.

\[ t_{\text{observed}} > t_{\text{critical}} (8.09 > 2.79) \]
### 2.8.5 Control Group versus Experimental Group on the Post-test

In order to compare the results, the means of the post-test for both groups should be calculated:

<table>
<thead>
<tr>
<th>Experimental group:</th>
<th>Control group:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \bar{X} = \frac{\sum x}{N} = \frac{218}{26} = 8.38 )</td>
<td>( \bar{X} = \frac{\sum x}{N} = \frac{82}{21} = 3.90 )</td>
</tr>
</tbody>
</table>

When comparing the means (\( \bar{X} \)), it was noticeable that the experimental group with a mean \( \bar{X} = 8.38 \) outscored the control group with a mean \( \bar{X} = 3.90 \).

For the total 47 scores, we have:

**Control group:**

\[ 2 \geq 6 \rightarrow 9.52 \% \geq 6 \]
\[ 19 < 6 \rightarrow 90.48 \% < 6 \]

**Experimental group:**

\[ 23 \geq 6 \rightarrow 88.46 \% \geq 6 \]
\[ 3 < 6 \rightarrow 11.54 \% < 6 \]
Table 3 and frequency polygon 2 show that the experimental group post-test frequency polygon begins at 2 (the lowest score) and ends at 12 (the highest score) with a peak at 10 (the most frequent score). Furthermore, the scores which are higher than the average are more frequent than those below the average in the post-test. Whereas, the control group post-test frequency polygon starts at 1 (the lowest score) and ends at 10 (the highest score). Furthermore, the scores which are below the average are more frequent than those above the average in the post-test.

In order to see whether or not the application of the independent variable (sentence writing strategy) leads to a significant change on the dependent variable (vocabulary memorization) i.e. to prove or disprove the alternative hypothesis, t-test for independent groups was conducted.

2.8.5.1 The Independent-Samples t-test

For calculating the independent- samples t-test, the same steps mentioned earlier are going to be followed:
Table 2.6: Square Post-test Scores of Both Groups on the Matching Task

<table>
<thead>
<tr>
<th>Students</th>
<th>Experimental group’s scores $X_1$</th>
<th>Square scores $X_1^2$</th>
<th>Control group’s scores $X_2$</th>
<th>Square Scores $X_2^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>06</td>
<td>36</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>100</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>3</td>
<td>09</td>
<td>81</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>4</td>
<td>04</td>
<td>16</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>06</td>
<td>36</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>07</td>
<td>49</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>100</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>8</td>
<td>07</td>
<td>49</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>9</td>
<td>09</td>
<td>81</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>100</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>11</td>
<td>07</td>
<td>49</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>12</td>
<td>02</td>
<td>04</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>13</td>
<td>12</td>
<td>144</td>
<td>06</td>
<td>36</td>
</tr>
<tr>
<td>14</td>
<td>10</td>
<td>100</td>
<td>05</td>
<td>25</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>100</td>
<td>03</td>
<td>09</td>
</tr>
<tr>
<td>16</td>
<td>09</td>
<td>81</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>12</td>
<td>144</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td>10</td>
<td>100</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>19</td>
<td>05</td>
<td>25</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td>100</td>
<td>02</td>
<td>04</td>
</tr>
<tr>
<td>21</td>
<td>10</td>
<td>100</td>
<td>04</td>
<td>16</td>
</tr>
<tr>
<td>22</td>
<td>10</td>
<td>100</td>
<td>$\sum X_2 = 82$</td>
<td>$\sum X_2^2 = 394$</td>
</tr>
<tr>
<td>23</td>
<td>10</td>
<td>100</td>
<td>$\bar{X} = 3.90$</td>
<td>---</td>
</tr>
<tr>
<td>24</td>
<td>07</td>
<td>49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>08</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>08</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$\sum X_1 = 218$</td>
<td>$\sum X_1^2 = 1972$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\bar{X}_1 = \frac{\sum X_1}{N_1} = \frac{218}{26} = 8.38$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Mean

Experimental Group

$\sum X_1 = 218$

$\sum X_1^2 = 1972$

$\bar{X}_1 = \frac{\sum X_1}{N_1} = \frac{218}{26} = 8.38$

Control Group

$\sum X_2 = 82$

$\sum X_2^2 = 394$

$\bar{X}_2 = \frac{\sum X_2}{N_2} = \frac{82}{21} = 3.90$
The Sample Variance

\[ S_1^2 = \frac{\sum x_1^2}{N_1} - \overline{x}_1^2 \]
\[ S_2^2 = \frac{\sum x_2^2}{N_2} - \overline{x}_2^2 \]

\[ = \frac{1972}{26} - (8.38 \times 8.38) \]
\[ = 75.85 - 70.22 = \boxed{5.63} \]

\[ = \frac{394}{21} - (3.90 \times 3.90) \]
\[ = 18.76 - 15.21 = \boxed{3.55} \]

The t-value

\[ t_{N_1+N_2-2} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{(N_1+N_2-2)N_1N_2}} \sqrt{(N_1S_1^2 + N_2S_2^2)/(N_1 + N_2)} \]

\[ t_{26+21-2} = \frac{8.38 - 3.90}{\sqrt{(26+21-2)(26\times21)}} \sqrt{(26\times5.63+21\times3.55)(26+21)} \]

\[ t_{45} = \frac{4.48 \sqrt{45 \times 546}}{\sqrt{(146.38+74.55)(47)}} \]

\[ t_{45} = \frac{4.48 \sqrt{24570}}{\sqrt{220.93 \times 47}} \]

\[ t_{45} = \frac{4.48 \times 156.75}{\sqrt{10383.71}} = \frac{702.24}{101.90} \]

\[ t_{45} = \boxed{6.89} \]

When calculating the degree of freedom (df=\(N_1 + N_2 - 2 = 26 + 21 - 2 = 45\)), which represents a critical t-value (2.69) at the 0.01 level of significance; it is compared with the observed t-value. From comparison, it is clear that the observed t-value is higher than the critical t-value.

\[ t_{\text{observed}} > t_{\text{critical}} \]

\(6.89 > 2.69\)
Thus, there is a significant difference between the experimental and control group post-test means. Therefore, the alternative hypothesis is accepted whereas the null hypothesis is rejected. In other words, there is 99% probability that the difference between experimental and control group scores was due to the manipulation of the independent variable (sentence writing strategy) and only 1% probability that it was due to chance.

Finally, it can be claimed that using sentence writing strategy in EFL classrooms has a significant influence on developing the vocabulary memorization of first year students at Mobarek el- Mili Secondary School in Ain babouche.

**General Discussion**

The current study was conducted to examine the effectiveness of using sentence writing strategy on developing EFL learners’ vocabulary memorization. The following hypothesis has been tested:

Students who learn vocabulary through sentence writing strategy would show better memorization of vocabulary than those who do not.

The analysis of findings demonstrates that the experimental group outperformed the control group on the post-test. The reason of this significant improvement is due to the use of sentence writing strategy as a treatment for teaching vocabulary. Thus, the alternative hypothesis is proved.

The major findings concerning the improvement of both control and experimental groups are discussed:

Firstly, it was noticeable that there is no significant improvement in vocabulary memorization of the control group participants in the post-test as compared to the
experimental group participants. This means that following the traditional method which is presenting the new words in the form of word lists was not effective in improving learners’ vocabulary memorization. The reasonable explanation is that subjects did not store the new words in their long-term memory because they learned vocabulary out of any context i.e. they were not engaged in written tasks which involve using the target words in a meaningful context. That’s why, they forgot the learned words.

Secondly, it was noticeable that the experimental group did show a highly significant progress in vocabulary memorization in the post-test as students performed very well in the vocabulary matching task, as compared to the control group. The reasonable explanation for this significant improvement is that this strategy helps students to memorize the new words that are learned in long-term memory by engaging them in written task which involves using the target words in a meaningful context (such as: writing a sentence). That’s why, they memorized the words.
General Conclusion

Knowing the vocabulary of the target language is considered as the foundation for successful comprehension and communication. Due to this, students are required to memorize sufficient words that enable them reach the aim behind learning a foreign language. On the other hand, it is difficult for learners to memorize all the target vocabulary. Based on this issue, the objective of the current study was to investigate the effectiveness of teaching vocabulary through using sentence writing strategy.

Relying on the analysis of the research findings and discussion of the results, it can be said that improving students’ vocabulary memorization via the use of the strategy that is known as ‘sentence writing’ is highly effective.

Limitations of the Study

The present study has encountered some limitations such as lack of time to conduct the experiment and luck of references.

Suggestions for Further Research

These are some suggestions for further investigations:

- Further research concerning sentence writing strategy can be implemented at the university level.
- Further research can be also conducted to examine the effects of using sentence writing strategy on another variable such as grammar.
- This study shows a positive effect of sentence writing strategy on developing students’ vocabulary memorization in the Algerian context. So, it is suggested to be carried out in other countries.
References


APPENDICES
Appendix A

_Pre-test_

**Activity:** Match each of the following words with its appropriate definition (12 pts)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Swallow</td>
<td>a- To put used objects and materials through a process so that they can be used again.</td>
</tr>
<tr>
<td>2- Renewable</td>
<td>b- Living or taking place in, on or near water.</td>
</tr>
<tr>
<td>3- Aquatic</td>
<td>c- To make something change from a solid to a liquid by means of heat.</td>
</tr>
<tr>
<td>4- melt</td>
<td>d- A situation where there is not enough of something.</td>
</tr>
<tr>
<td>5- Shortage</td>
<td>e- Consume</td>
</tr>
<tr>
<td>6- Recycle</td>
<td>f- Something will always exist and it will not disappear.</td>
</tr>
<tr>
<td>7- Contaminate</td>
<td>g- When an area that is usually dry becomes covered with water.</td>
</tr>
<tr>
<td>8- Drought</td>
<td>h- A natural or chemical substance that is put on land or soil to make plants grow better.</td>
</tr>
<tr>
<td>9- Fertilizer</td>
<td>i- To warn that something will happen if you do not stop doing dangerous things.</td>
</tr>
<tr>
<td>10- Rubbish</td>
<td>j- To pollute something by adding a dirty thing.</td>
</tr>
<tr>
<td>11- Flood</td>
<td>k- A long period of time when there is little or no rain.</td>
</tr>
<tr>
<td>12- Threaten</td>
<td>l- Things that you do not want any more.</td>
</tr>
</tbody>
</table>
### Appendix B1

**Treatment Phase One**

(The control group)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Drought</td>
<td>a- A long period of time when there is little or no rain.</td>
</tr>
<tr>
<td>2- Earthquake</td>
<td>b- Sudden, violent movement of the earth’s surface.</td>
</tr>
<tr>
<td>3- Flood</td>
<td>c- When an area that is usually dry becomes covered with water.</td>
</tr>
<tr>
<td>4- Melt</td>
<td>d- To make something changes from a solid to a liquid by means of heat.</td>
</tr>
<tr>
<td>5- Sandstorm</td>
<td>e- Violent wind carrying sand.</td>
</tr>
</tbody>
</table>
Treatment phase One

(The experimental group)

**DEFINITION SHEET 1**

Drought: a long period of time when there is little or no rain.

**DEFINITION SHEET 2**

Earthquake: sudden, violent movement of the earth’s surface.

**DEFINITION SHEET 3**

Flood: when an area that is usually dry becomes covered with water.

**DEFINITION SHEET 4**

Melt: to make something changes from a solid to a liquid by means of heat.

**DEFINITION SHEET 5**

Sandstorm: violent wind carrying sand.

**Activity:** Use these words to write your own sentences.
### Appendix B2

**Treatment phase Two**

(The control group)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Aquatic (adj)</td>
<td>a- Living or taking place in, on or near water.</td>
</tr>
<tr>
<td>2- Contaminate (v)</td>
<td>b- To pollute something by adding a dirty thing.</td>
</tr>
<tr>
<td>3- Congestion (n)</td>
<td>c- State of being full of something by which nothing can move.</td>
</tr>
<tr>
<td>4- Swallow (v)</td>
<td>d- To consume.</td>
</tr>
<tr>
<td>5- Traffic (n)</td>
<td>e- The movement of vehicles on a road at a particular time.</td>
</tr>
</tbody>
</table>
Treatment phase Two  
(The experimental group)

**DEFINITION SHEET 1**

Aquatic: living or taking place in, on or near water.

**DEFINITION SHEET 2**

Contaminate: to pollute something by adding a dirty thing.

**DEFINITION SHEET 3**

Congestion: state of being full of something by which nothing can move.

**DEFINITION SHEET 4**

Swallow: to consume

**DEFINITION SHEET 5**

Traffic: The movement of vehicles on a road at a particular time.

**Activity:** Use these words to write your own sentences.
### Appendix B3

**Treatment Phase Three**

(The control group)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Recycle</td>
<td>a- To put used objects and materials through a process so that they can be used again.</td>
</tr>
<tr>
<td>2- Renewable</td>
<td>b- Something will always exist and it will not disappear.</td>
</tr>
<tr>
<td>3- Rubbish</td>
<td>c- Things that you do not want any more.</td>
</tr>
<tr>
<td>4- Shortage</td>
<td>d- A situation where there is not enough of something.</td>
</tr>
<tr>
<td>5- Threaten</td>
<td>e- To warn that something will happen if you do not stop doing dangerous things</td>
</tr>
</tbody>
</table>
Activity: Use these words to write your own sentences.

Treatment Phase Three

(The experimental group)

---

**DEFINITION SHEET 1**

Recycle: to put used objects and materials through a process so that they can be used again.

---

**DEFINITION SHEET 2**

Renewable: something will always exist and it will not disappear.

---

**DEFINITION SHEET 3**

Rubbish: things that you do not want any more.

---

**DEFINITION SHEET 4**

Shortage: a situation where there is not enough of something.

---

**DEFINITION SHEET 5**

Threaten: to warn that something will happen if you do not stop doing dangerous things.
## Appendix B4

**Treatment Phase Four**

(The control group)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Erode (v)</td>
<td>a- To destroy something slowly.</td>
</tr>
<tr>
<td>2- Fertilizer</td>
<td>b- A natural or chemical substance that is put on land or soil to make plants grow better.</td>
</tr>
<tr>
<td>3- Rainforest</td>
<td>c- A thick forest in tropical parts of the world that have a lot of rain.</td>
</tr>
<tr>
<td>4- Soil</td>
<td>d- The substance that plants, trees, etc. grow in.</td>
</tr>
</tbody>
</table>
Treatment Phase Four

(The experimental group)

**DEFINITION SHEET 1**

Erode: to destroy something slowly.

**DEFINITION SHEET 2**

Fertilizer: a natural or chemical substance that is put on land or soil to make plants grow better.

**DEFINITION SHEET 3**

Rainforest: a thick forest in tropical parts of the world that have a lot of rain.

**DEFINITION SHEET 4**

Soil: The substance that plants, trees, etc. grow in.

*Activity:* Use these words to write your own sentences.
Appendix D

Post-test

Activity: Match each of the following words with its appropriate definition (12 pts)

<table>
<thead>
<tr>
<th>Word</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Swallow</td>
<td>a- To put used objects and materials through a process so that they can be used again.</td>
</tr>
<tr>
<td>2- Renewable</td>
<td>b- Living or taking place in, on or near water.</td>
</tr>
<tr>
<td>3- Aquatic</td>
<td>c- To make something change from a solid to a liquid by means of heat.</td>
</tr>
<tr>
<td>4- Melt</td>
<td>d- A situation where there is not enough of something.</td>
</tr>
<tr>
<td>5- Shortage</td>
<td>e- Consume.</td>
</tr>
<tr>
<td>6- Recycle</td>
<td>f- Something will always exist and it will not disappear.</td>
</tr>
<tr>
<td>7- Contaminate</td>
<td>g- When an area that is usually dry becomes covered with water.</td>
</tr>
<tr>
<td>8- Drought</td>
<td>h- A natural or chemical substance that is put on land or soil to make plants grow better.</td>
</tr>
<tr>
<td>9- Fertilizer</td>
<td>i- To warm that something will happen if you do not stop doing dangerous things.</td>
</tr>
<tr>
<td>10- Rubbish</td>
<td>j- To pollute something by adding a dirty thing.</td>
</tr>
<tr>
<td>11- Flood</td>
<td>k- A long period of time when there is little or no rain.</td>
</tr>
<tr>
<td>12- Threaten</td>
<td>l- Things that you do not want any more.</td>
</tr>
</tbody>
</table>
المتخص

قد أجريت هذه الدراسة من أجل تقصي أثر استخدام "استراتيجية كتابة الجملة" على تطوير حفظ المفردات لدى طلاب الصف الأول الثانوي. من أجل تحقيق هدف هذه الدراسة، تم تطبيق المناهج التجريبي بتصميم تجريبي أين تم تعيين مجموعة تجريبية و مجموعة ضابطة. ضمت العينة المستهدفة ثلاثة وسبعون طالب وطالبة يدرسون السنة الأولى (الفترة العلمي) في ثانوية مبارك الميلي بعين بوقش - أم البواقي - للعام الدراسي 2014-2015. بالإضافة إلى ذلك خضع المشاركون لاختبار أولي. بعد مرحلة إجراء الاختبار، أجري العلاج لكل المجموعتين لمدة أربع جلسات. لقد كانت المجموعة التجريبية تدرس المفردات باستخدام "استراتيجية كتابة الجملة". وكانت المجموعة الضابطة تدرس المفردات من خلال قائمة الكلمات، وفقا لطريقة العادية المستخدمة من قبل معلمنهم. بعد ذلك خضعت كلتا المجموعتين للفحص التاريخي الذي تم اجرائه في مرحلة ما قبل العلاج. بعد تحليل النتائج التي تم الحصول عليها، تم إثبات الفرضية البديلة. مما يعني أن "استراتيجية كتابة الجملة" لها تأثير إيجابي على تطوير قدرة الطلاب على حفظ المفردات المستهدفة.
RÉSUMÉ

La présente étude a été menée afin d'étudier l'effet de l'utilisation de 'la stratégie d'écriture de la phrase' sur le développement de la mémorisation du vocabulaire des étudiants de première année de l'enseignement secondaire. Par souci de parvenir à l'objectif de la recherche, une méthode expérimentale avec un modèle quasi-expérimentale a été menée où deux groupes préexistants ont été assignés au hasard que les groupes (expérimental et contrôle). L'échantillon cible comprenait soixante-treize étudiants en première année (courant scientifique) à Lycée de Mobarek El-Mili à Ain Babouche - Oum El Bouaghi pour l'année académique 2014-2015. En outre, les participants des deux groupes (expérimental et contrôle) ont été pré-testée en utilisant une tâche vocabulaire correspondant. Après l'administration du pré-test, le traitement a été effectué pour les deux groupes de quatre sessions. Le groupe expérimental a été enseigné vocabulaire en utilisant la stratégie d'écriture de la phrase et le groupe de contrôle a été enseigné vocabulaire à travers la liste de mots, la méthode ordinaire utilisée par leur enseignant. Ensuite, les deux groupes ont été post-testé par la même tâche d'adaptation de vocabulaire utilisé dans le pré-test. Après avoir analysé les résultats obtenus, l'hypothèse alternative a été prouvée. Cela est-à-dire, la stratégie d'écriture de la phrase a un effet positif sur le développement de la capacité des élèves à mémoriser le vocabulaire cible.