PEOPLE'S DEMOCRATIC REPUBLIC OF ALGERIA

MINISTERY OF HIGHER EDUCATION AND SCIENTIFIC RESEARCH

UNIVERSITY OF 8 MAI 1945
FACULTY OF LETTERS AND LANGUAGES
DEPARTMENT OF LETTERS AND ENGLISH LANGUAGE

جامعة 8 ماي 1945 قالمة
كلية الآداب و اللغات
قسم الآداب و اللغة الإنجليزية

OPTION: LINGUISTICS

The Effect of Time Management Skills on Information Processing, Retention and Recall:

the Case of Second-Year Master Students at the Department of English, 8 Mai 1945 University, Guelma.

A Dissertation Submitted to the Department of Letters and English Language in Partial Fulfillment of the Requirements for Master's Degree in Language and Culture

Submitted by

Ms. Chafia SOUAHLIA

Mrs. Yassamine KSOURI

Supervised by:

Mrs. Mounya ABDAOUI

Board of Examiners

Chairwoman: Mrs. Amina BOUDRAA	(MAB)	University of 8 Mai 1945, Guelma
Supervisor: Mrs. Mounya ABDAOUI	(MAA)	University of 8 Mai 1945, Guelma
Examiner: Ms. Naziha BENKAMOUCHE	(MAA)	University of 8 Mai 1945, Guelma

2019-2020

Dedication

In the name of Allah, the most merciful, and the most compassionate

I dedicate this work to the most precious people in my life, to my beloved mother **'Fatiha'** and supportive father **'Rabeh'** for their love, tenderness, encouragement, support, their never-ending advice and patience.

To my brothers **'Noureddine', 'Haroune', 'Chouaib' and 'Abdelmoumene'**, may Allah bless them all

To all my family members including my aunts and uncles, all my cousins and to my friends as well

I would like to express my gratitude to my best friend Rawnek for her help even with words

To my fiancé and my prince for his uncountable morale-boosting words

and finally, to all the people who contributed in the accomplishment of this work

To my dear friend and colleague **Yassamine** who has been supportive, caring and helpful.

CHAFIA

Dedication

First and foremost, I dedicate this humble work

To my beloved mother "**Faiza**", my dear father "**Hassane**" and my caring brother "**Charafeddine**". I want to thank them for their unconditional love and ceaseless support. Without their assistance and encouragement, I would never been reached this point in my academic career.

To my husband who never stopped supporting me and pushing me further.

To my dear friend and colleague **Chafia** who has been supportive, caring and helpful.

YASSAMINE

Acknowledgements

"We must find time to stop and thank the people who made a difference in our lives".

(John F. Kennedy)

The first and foremost thanks go to the almighty Allah for giving us the strength, patience and willingness to accomplish this work.

This piece of work would never have been accomplished without the guidance, assistance and encouragement of our dear and beloved supervisor **Mrs. Mounya ABDAOUI** who gave us insightful ideas and suggestions that helped in the fulfillment this work.

We would like to thank the jury members **Ms. Naziha BENKAMOUCHE** and **Mrs. Amina BOUDRAA** for accepting to evaluate our humble work.

Nobody has been more supportive and helpful than **Dr. Abdalwahab BENAMARA**

We would like to express our gratitude and appreciation for our dear teacher **Mrs. Hosna HENAINIA**

We would like to thank **Charafeddine KSOURI** for his advice and help

Special thanks go to the twins **Nessrine BENERDJEM** and **Romaissa** who took part in the accomplishment of this dissertation.

Abstract

The current research aims at investigating the effect of time management skills on information processing, retention and recall. Mainly, this research reveals the students' perspectives following the determined purposes and questions of the topic. Hence, we hypothesized that effective time-management could have an influence on information processing, retention and recall. To test the hypothesis, the descriptive method was adopted through the administration of students' online questionnaire by sending a digital version to Master students of second-year at the department of English, 8 Mai 1945 University-Guelma. The obtained findings indicated the strong impact of time management skills on information processing, retention and recall. Therefore, time management should be taken seriously into account to enhance students' mental capacities as far as information processing, retention and recall are concerned.

List of Acronyms and Abbreviations

ACTFL: American Council on the Teaching of Foreign Languages

ADHD: Attention-Deficit/Hyperactivity Disorder

AGT: Achievement Goal Theory

EFL: English as a Foreign Language

GST: Goal Setting Theory

IG: Intermediary Goals

IO: Information Overload

IP: Information Processing

LTG: Long Term Goals

LTM: Long-Term Memory

L2: Second Language

MG: Mastery Goals

NH: Needs' Hierarchy

PAG: Performance Achievement Goals

POSEC: Prioritizing, Organizing, Streamlining, Economizing and Contributing

SM: Sensory Memory

'SMART' goals: Specific, Measurable, Achievable, Realistic and Time-bound

STG: Short Term Goals

STM: Short-Term Memory

WM: Working Memory

TM: Time Management

WMT: Working Memory Training

5 Cs: 'Communication', 'Cultures', 'Connections', 'Comparisons', and 'Communities'

List of Tables

List of Figures

Table of Contents

General Introduction

In recent years, cognitive psychology has been evolved to reveal the mechanisms operated by the human brain and the processes involved to perform certain cognitive tasks. The most essential cognitive processes that many scholars investigated and studied in depth are: information processing, retention and recall. These processes are assumed to be mentally constructed and eventually executed through the nervous system in particular brain areas. The key component of processing, retention and recall is information which is a representation of the aspects found in the individuals' environments. Therefore, information is primarily processed then retained, and retrieved later on. Accordingly, the human memory is very nebulous and complex to understand despite the existence of plenty of research on it. However, the available literature succeeded to provide a reliable sequence of theories and models to explain the major aspects and components of memory from a variety of perspectives. Moreover, many psychologists proposed the elements of memory systems on the basis of the processed input nature. As any other mental process, memory can be affected by several factors such as attention, rehearsal, sleep…etc. In this regard, memory cannot be totally isolated and considered as an independent entity. In addition, a bunch of methods were developed as an endeavor to empower the capacity of memory according to the learners' profiles. Practically speaking, these methods can be perfectly mastered through memory training which offer programs to be followed in order to improve the trainee's memory. To this end, it is highly important to understand the concepts of information processing, retention and recall to determine one's abilities and weaknesses.

As the world is witnessing a massive growth, time is becoming more valuable than ever in all fields. People start to look at time from a functional perspective to increase productivity and efficiency. Hence, the concept of time management emerged to regulate individuals' view about time, and then adjust it according to their tasks and requirements.

In this respect, education is one of the domains that is strongly interested in time management and its skills. Deeply, time management skills are said be very beneficial once they are mastered. Adopting time management behaviors allows students to invest their time appropriately and effectively, and to avoid stress and pressure. Equally, this gives them a sense of satisfaction and encourage them to attain bigger goals. Time management skills should be incorporated in the learning process to help students to organize, prioritize, plan, set goals, manage external time wasters, and avoid multitasking. Accordingly, researchers offered a variety of methods and techniques to perfectly apply time management skills such as the Pareto Principle, the Pomodoro Method, the POSEC Analysis…etc. Also, it is worthy to mention that technology and time management are strongly related in nowadays world. Many students make use of time management technological tools to save time and effort. Consequently, time management has a significant role that cannot be ignored in students' academic lives, since it provides them with the necessary organizational directives.

1. Statement of the Problem

Many second-year Master students in the department of English at Guelma university encounter difficulties mainly related to information processing, retention, and recall. Most of the time, the students find themselves in a serious dilemma because they are exposed to considerable amount of information in each subject matter, and what makes it more complicated for them is time constraints. Furthermore, it is observed that most of the students tend to memorize each and every piece of information without being selective, and eventually they fail to do so. Actually, poor time management may lead to the occurrence of such problem. The students are not skillful enough to manage their time effectively in a way that they may not allocate the needed time to process and retain the information and they keep things accumulating. Also, underestimating the value of time could inevitably lead to procrastinating the task of processing and storing the information; which in turn lead to unsatisfactory outcomes (recall failure). Hence, our research targets the following main question:

Does effective time-management have an impact on information processing, retention and recall?

2. Aims of the Study

This research aims at revealing the importance of time management and its role in enhancing information processing, retention and recall within Foreign Language classrooms. Thus, our study targets the use of time management skills and the effect it creates on the mental abilities of processing, retaining and retrieving information. The research attempts to explore the extent to which managing time through different strategies can help learners cope and deal easily with processing the information no matter how much it is difficult and to be able to recall it whenever necessary. Moreover, it is an attempt to find out the strengths and weaknesses of using time management skills

as well as to find the main reasons behind not using time management skills effectively. In short, the current research addresses the following two aims:

1. To identify the role of effective time management in relation to the mental abilities of processing, retaining and recalling information.

2. To raise students' awareness about the importance of time management skills.

3. Research Hypothesis

The current study tends to explore the role of effective time management skills in improving information processing, retention and recall. Hence, we hypothesize the following:

H_1: If students use time management skills effectively, their information processing, retention and recall would improve.

The null hypothesis (H_0) implies that there is no relationship between effective time management skills and information processing, recall and retention. Eventually, we can hypothesize that:

H_0: If students use time management skills effectively, their information processing, retention and recall would not improve.

4. Research Methodology and Design

4.1. Research Method

For the aim of investigating the impact of time management skills on information processing, retention and recall, the quantitative descriptive method is used. Through administering students' questionnaire, the hypothesis of the research was tested. The questionnaire is chosen for this research because it is a reliable and quick method to collect information from multiple respondents in an efficient and timely manner.

4.2. Population of the Study

The targeted population is second-year Master students in the department of English at the University of 8 Mai 1945, Guelma. The promotion is composed of one hundred twenty-seven (127) students. The main reasons behind choosing such sample, firstly is that second-year Master students are more experienced than the other students and they got used to the subject matters and to the educational system as well. Secondly, even though they have studied for five years, they still have problems with time management skills especially in cases of writing researches or doing assignments.

4.3. Data Gathering Tools

The questionnaire was used as a data collection tool in this study. It aimed at figuring out whether students use time management skills effectively. Besides, the questionnaire tended to discover whether students link between time management skills and other aspects and most importantly to see whether they manage their time in relation to the information processing, retention and recall.

5. The Structure of the Dissertation

This research is divided into two main parts. The first part is purely theoretical which is in turn composed of two chapters; whereas the second part includes only one practical chapter. The first chapter is entitled “information processing, retention and recall.” This chapter provides description of the information processing, retention and recall along with the psychological theories and the main strategies of processing the information and retrieving it as well as the importance of retention as a vital element in recalling the information. Additionally, this chapter includes models of memory.

The second chapter is entitled “time management skills”. This chapter provide the theoretical background to the notion of time management and its various skills along with providing a review about issues related to it as well as the role of technology in time

management. Moreover, the chapter deals with time management interruptions. Finally, the practical part describes the study conducted on the selected group of second-year Master Students. It deals with a detailed analysis of the results from the students' questionnaires.

Chapter One

Information Processing, Retention and Recall

Introduction

The three concepts of processing, retention and recall of information are intertwined with the areas of memory and the human cognition and other disciplines. They could be also described as mental processes in which the brain takes the ultimate role, so that they could occur in a normal way along with absence of any neurobiological issues. These concepts are wide spread in the field of education especially with students in the period of exams and quizzes, and in most of the time they probably determine the success and failure of each student. Furthermore, the concepts of processing, retention and recall are dependable on each other, and dependable on the various strategies and techniques that are used by each student in order to accomplish his/her purposes.

Many psychologists studied these concepts and provided a vast literature that tackles different theories, models, strategies and issues to understand how the human brain processes and performs. In this respect, this chapter deals with the basic definitions of information processing, retention and recall that different psychologists offered, then the prominent models of these processes. Moreover, this chapter covers the factors that influence information processing, retention and recall. In addition, it highlights several memory methods that students can rely on such as: the link technique, visualization, chunking…etc. Also, this chapter provides a sufficient explanation to the different components of human memory, and the effectiveness of memory training as well.

1.1. Information Processing

1.1.1. Definition of Information Processing

Information processing (IP) is an essential concept in the sphere of human cognition which in turn deals with inputs as the computer does (Gardner, 1985, p. 105). Neisser (1958) was the first psychologist who attempted to apply computer analogies on human

cognition in terms of information processing (as cited in Broadbent, 1967, p. 62). Similarly, Laird (1988) supports the computer analogy by explaining that:

> The invention of the programmable digital computer, and more importantly its precursor, the mathematical theory of computability, have forced people to think in new way about the mind. …All the computer ever does is to manipulate late binary numerals, but fifty years of research has failed to find a process that cannot be modeled by these manipulations. The computer analogy can be analyzed into three components that form the basis for three themes of information-processing psychology: hardware, such as viewing the mind as an information processing system; software, such as viewing cognition as applying cognitive processes; and data, such as viewing learning as knowledge acquisition (as cited in Mayer, 1996, p. 154-155).

According to this perspective, the human mind can be viewed as a programmed computer in the way it processes information. An analogy was made between human information processing and computer information processing which is based on three concepts. First, human beings process and assimilate the input or the information as the hardware of the computer does. Second, the software can be a digital version of human cognition. Finally, data is similar to the processes of knowledge acquisition and learning.

Massaro and Cowan (1993) explained that information processing refers to "how the information is modified so that it eventually has its influence […] the basic notion of IP is that one must trace the progression of information through the system from stimuli to responses" (p. 384-386). In other words, information processing is the process that starts from the entrance of a raw input and ends with the final output. According to Mayer (1996), human beings can be considered as information processors, while the mind constitutes the different components of information processing system. Furthermore, the

human cognition comprises a sequence of mental processes, and learning can be described as the attainment of various mental processes. These definitions represent the important principles of the concept of information processing (p. 154). He added that information processing model might have two main interpretations that could be made on the basis of "mental representations" and "mental processes" (1996, p. 155). The following table explains these two views. The first view is called the literal view through which the student is able to execute some mental processes that help to transform the input to an output. The second view is named the constructivist view. This view is concerned with constructing knowledge through the selection, organization, and integration of newly processed information with the previous schema.

Table 1.1

Two Views of the Information-Processing Metaphor

View	**Content**	**Activity**	**Learner**
Literal	Information	Processing	Performs a series of discrete mental operations on input information and stores the output
Constructivist	Knowledge	Constructing	Actively selects, organizes, and integrates incoming experience with existing knowledge

Adapted from: Mayer, 1996, p. 156.

1.1.2. Stages of Information Processing

In the light of the previous literature, information processing is said to be a very complicated process that has to be divided into several phases. For instance, Robert and

Wyer (2006) explained that information processing has different stages through which many other processes occur (2006, p. 186). They stated that information processing starts with comprehension which is a total automatic process that contains a relevant and accessible input to human memory (2006, p. 186). Then, the obtained input would be transmitted in a form of information processing units which in turn would perform particular "cognitive activities" in order to fulfil pre-determined purposes, and the final product would be the information output to be stored in human memory (Robert & Wyer, 2006, p. 186).

Massaro and Cowan (1993) claimed that the field of visual perception is strongly interested in the stages of information processing (p. 408). These stages are 'retinal transduction', 'sensory cues', 'perceived attributes' (DeYoe & Van Essen, 1988, as cited in Massaro & Cowan, p. 408). Massaro and Cowan (1993) gave the example of the physical motion: "as an example, physical motion provides information about both the shape of an object and its movement. Similarly, information about the shape of an object is enriched not only by the physical motion, but also by "linear perspective, binocular disparity, and shading" (p. 408).

1.1.3. Models of Information Processing

A variety of models were designed concerning the concept of information processing in order to understand its processes and functionalities. The following models are the most important ones in the field of human cognition.

1.1.3.1. Sherman's Quad Model

Sherman (2006) stressed that "the traditional dual-processing models" have witnessed a great decline since it failed at understanding and differentiating between the dominant cognitive processes that are included in information processing. So, he suggested the dichotomies of 'controlled processes' and 'automatic processes' (as cited

in Robert & Wyer, 2006, p. 187). The controlled processes can be understood as the detection of the wrong information and the determination of the correct ones, while automatic processes are the use of deliberate association in order to highlight or give more attention to the input (Conrey, Sherman, Gawronski, Hugenberg & Groom, 2005, p. 470). According to Orehek and Kruglanski (2006), the Quad Model proposes that there is: "four qualitatively distinct processes: two automatic and two controlled. The automatic processes are referred to as association activation and guessing. The controlled processes are referred to as overcoming bias and discriminability" (p. 307).

1.1.3.2. Kruglanski et *al.*'s Unimodel

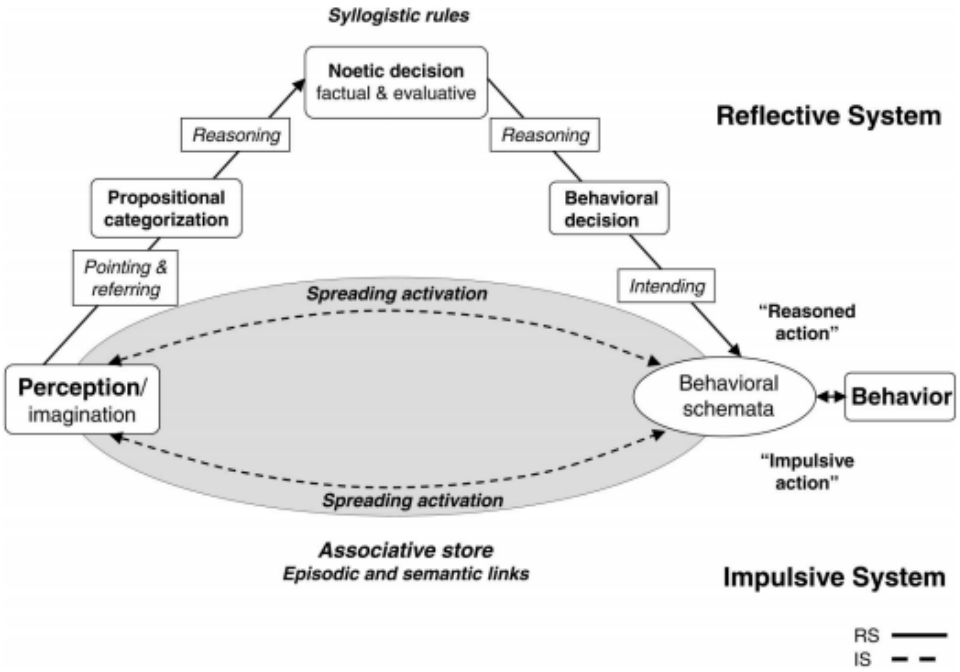
Kruglanski and his colleagues proposed a unimodal that is described as challenging to the traditional dual-processing models in terms of social factors that could influence information processing, which means that this model is exclusively applicable to persuasion and communication (Robert & Wyer, 2006, p. 189-190). In addition, the unimodal suggests that the way people set their judgements is primarily based on the association of various 'orthogonal parameters' in order to find out to what extent the processed information affects the final judgement (Orehek & Kruglanski, 2006, p. 309).

1.1.3.3. Deutsch and Strack's Reflective-Impulsive Model

Similar to Sherman's Quad Model, Deutsch and Strack offered two dichotomies which are reflective and impulsive processes or systems (as cited in Robert & Wyer, 2006, p. 192). Deutsch and Strack mentioned that: "this model assumes that information entering the perceptual gates will always be processed in the impulsive system. However, the impact of that information depends to a great extent on the pre-activation of those structures in the impulsive system in which the information is represented. Depending on its intensity and the attention it receives, a stimulus may also enter the reflective system" (2004, p. 223). Robert and Wyer explained that reflective processes require awareness

and consciousness in order to reach particular purposes; however, impulsive processes depend on the automatic association to make sense of the outer world (2006, p. 192). In fact, reflective and impulsive processes interact with each other to have a meaningful input (Robert & Wyer, 2006, p. 192).

Figure 1.1. Overview of the Reflective–Impulsive Model.



Adapted from: Deutsch & Strack, 2004, p. 222.

1.1.4. Difficulties in Information Processing

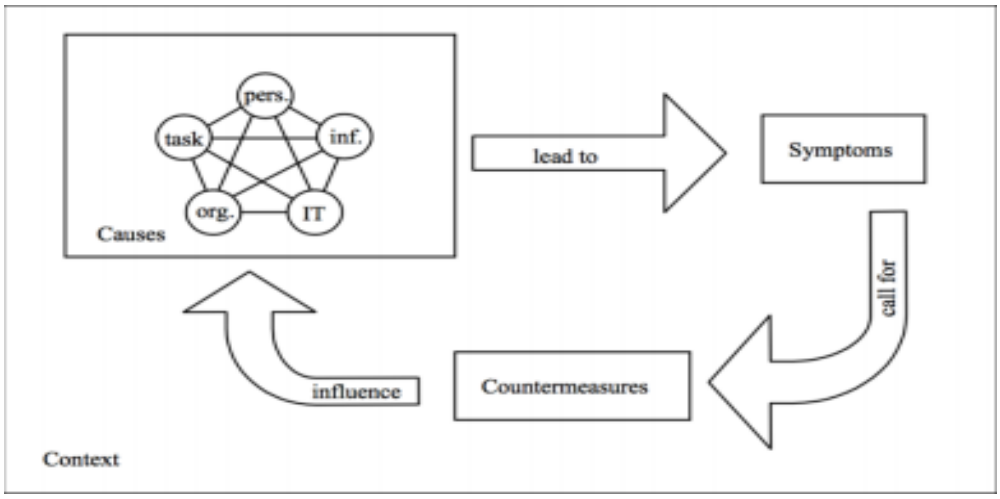
Many researchers attempt to understand what hinders good information processing especially in relation to the educational sphere, since students in most of time are in need to perform such mental process mainly for academic purposes.

1.1.4.1. Information Overload

Eppler and Mengis (2003) explained the notion of information overload (IO) as "the state of stress experienced when the amount of information given exceeds the limit of information user processing capacity" (as cited in Alheneidi, 2019, p. 1). According to

them, information overload could be synonymous to a variety of notions found in psychology such as: “cognitive overload”, “information fatigue syndrome”, “communication overload”, “sensory overload”, “knowledge overload” (as cited in Alheneidi 2019, p. 1). In addition, Bawden et *al* (2000) defined information overload as: “receiving too much information for the user to handle. This results in information becoming a hindrance instead of a benefit” (as cited in Alheneidi, 2019, p. 10). Moreover, Savolanien et *al* (2018) argued that information overload has negative influence on the level of information processing since it constitutes a kind of cognitive block that leads to anxiety (as cited in Alheneidi 2019, p. 2). Eppler and Mengis (2003) created a model for information processing in order to understand the causes and effects of information overload on information processing, but this model did not provide a full research on how exactly information overload occur (Alheneidi, 2019, p. 13). The model is presented as follows:

Figure 1.2. A Conceptual Framework to Structure Research on Information Overload.



Adapted from: Alheneidi, 2019, p. 14.

In this context, Eppler and Mengis (2003) attempted to offer a deeper explanation for the causes of information overlaod through providing a specific categorization. First, information overload could occur because of the quality, quantity, intensity and general features of the given information. Second, the characteristics of the learner who receives the information and the degree of familiarity may cause information fatigue. Third, the technological means through which the information is delivered may highly lead to information overlaod. Finally, information overload may take place due to the way the information is organized (as cited in Alheneidi, 2019, p. 16).

1.1.4.2. Information Processing Disorders (Sensory, Visual, Auditory)

Cheng and Boggett-Carsjens (2005) argued that the sensory stimulation is of great importance for normal mental development and effective information processing; however, any existence of disorder would form an obstacle which is termed by many authors as ‘‘sensory perceptual impairments’, ‘sensory processing disorders/problems’, ‘sensory dysfunction’, ‘disturbances of sensory modulation/information processing’ (p. 45). Furthermore, de Gangi et *al* (2005) claimed that several sensory problems can be found in attention-deficit/hyperactivity disorder (ADHD), tactile hypersensitivity, and many other mental issues such as:

a) Sensory overload in busy environments (e.g. classroom, malls, playgrounds)

b) Auditory hypersensitivities

c) Visual distractibility with difficulty screening out relevant from non-relevant visual stimuli, and poor coordination of eyes for focused report, e.g. easily overwhelmed by excess visual stimuli; problems following words while reading

d) Tactile hypersensitivity

e) High need for proprioceptive input (weight, pressure, traction), i.e. 'hyperactivity'

f) High need for vestibular movement activities, i.e. 'hyperactivity' (as cited in Cheng & Boggett-Carsjens, 2005, p. 46).

1.1.4.3. Lack of Attention

Shiffrin (1988) claimed that: "attention has been used to refer to all those aspects of human cognition that the subject can control […] or aspects of cognition having to do with limited resources or capacity, and methods of dealing with such constraints" (as cited in Massaro & Cowan 1993, p. 404). In this respect, Massaro and Cowan pointed that attention is crucial for good information processing, and its lack leads to a disturbance in the initial stages of information processing which is in turn described by Palmer and Kimchi (1986) as "the principle of decomposition" (1993, p. 405).

1.1.5. Limitations of Information Processing

Mayer argued that the development of cognitive theories in relation to learning seriously attempts to overcome the drawbacks of information processing through stressing on the nature of both information and processing (1996, p. 158). He explained that:

> The limitations of some versions of information-processing theory rest in the atomistic view of information as a commodity that could be taken from the outside and placed directly within learner's memory and the mechanistic view of processing as applying a symbol-manipulation algorithm to information in the learner's memory. The major shortcoming of information-processing psychology, perhaps, was the failure to acknowledge that humans process information for a purpose. The search for what is missing from this view has helped to enrich the field (1996, p. 158).

In the previous quote, it is claimed that the study of information processing theory was based on only two segments. First, information processing is concerned with taking the information from the environment and moving it the student's memory. Second, information processing could be seen as the performance of 'symbol-manipulation algorithm' on the information retained in memory. However, this conception about information processing neglects the aims upon which information are processed.

1.2. Information Retention and Recall

Retention and recall have been always key aspects to human cognition, and many studies and researches have investigated their mechanisms and structural systems in order to understand how human memory functions. In the light of these notions, many other fields would intervene such as: cognitive psychology, neurology, biology…etc. Accordingly, any investigation about information retention and recall requires a deep understanding of human memory.

1.2.1. Definition of Memory Retention and Recall

The Oxford dictionary defined '*memory*' as: "the mental capacity of holding evidences, actions, imitations, and so forth or recollecting earlier practices" (as cited in Amin & Malik, 2013, p. 331). Moreover, from a functional perspective, memory is described as "the capability to encode, hold, and subsequently remember material in the brain", and from psychological and neurological perspective memory is described as: "the collection of encoded neural connections in the brain. It is the rebuilding of previous happenings and practices by a synchronous firing of neurons that were fired at the time of learning" (Amin & Malik, 2013, p. 331). Accordingly, memory has dual views from which one can apprehend this complex component of the human mind. On the one hand, memory is about encoding, retaining and retrieving the encoded information later on. On

the other hand, memory is neurologically explained the release of the neurons that were released in the process of learning a particular information.

Furthermore, Amin and Malik (2013) defined retention and retrieval respectively as: “the capability to hold information, and retrieval is the recollection of held information in the mind in response to external stimuli” (p. 332). According to them (2016), the processes of retention are associated with memory as the capacity of human beings to understand and process the information presented, then storing that information in memory, and finally retrieving it whenever necessary (p. 224). They added that the absolute role of retention is to store the encoded information, and the role of retrieval is to get access to the stored information (Amin & Malik, 2016, p. 224). This indicates that both processes of retention and recall are closely related to each other in the sense that retrieval cannot occur unless the information is retained in memory.

Besides, Pampori and Malla (2016) defined recall as: “the third process of memory which involves the retrieval or recollection of stored information that must be located and returned to our consciousness in response to some cue for use in a process or activity” (p. 339). In brief, the authors classified the process of recall as the last process of memory. This process occurs when an information retained in the human conscious mind is retrieved due to an external stimulus.

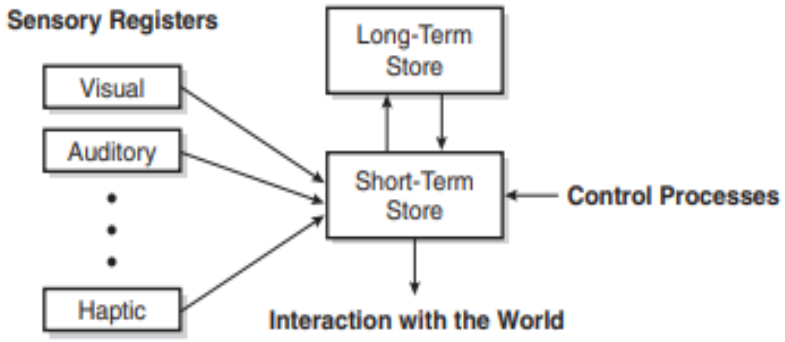
1.2.2. Memory Storage Systems

Memory systems are said to be very complicated and inseparable, but many psychologists attempted to describe the operations of each part distinctly. Sumrall et *al* (2016) argued that: “the memory systems considered so far are all concerned with long-term retention, spanning time periods of minutes, hours, weeks and years” (p. 28). In accordance to this perspective, memory systems are strongly associated with long-term memory, and the periodization of the stored information in that memory. Also, Kellog

(2007) claimed that “memory involves more than these three separate storage systems. It also involves three basic processes that form mental representations and operate on them. Encoding concerns perceiving, recognizing, and further processing an object or event so that it can be remembered later” (p. 94). To put it simply, memory systems cannot be restricted only to sensory memory, short-term memory and long-term memory, but rather they encompass the mental representations of the information that were formed through perception, recognition and processing.

According to Atkinson and Shiffrin, memory is structured into three essential parts namely, ‘the sensory register’, ‘short-term store’ and ‘the long-term store’. This is presented in the following figure:

Figure 1.3. The Modal Model of Memory

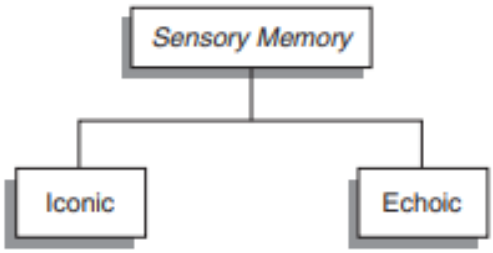


Adapted from: Atkinson & Shiffrin, 1968, p. 89.

Amin and Malik (2014) defined the ‘sensory memory’ or ‘sensory register’ (SM) as: “the capability of holding sensory information from stimuli received through the 5 senses (visual, auditory, odor, taste, and tactile). Its time duration is very short and occurs in seconds. It works as a buffer in getting the stimuli via the senses (for example, eyes and ears). This information is then handed over from sensory to short-term memory (STM) through selective attention” (p. 331-332). The ‘sensory register’ works on keeping the incoming information immediately after the information is presented (Atkinson & Shiffrin, 1968, p. 92). Atkinson and Shiffrin (1968, p. 92) claimed that the information acquired or learned is absorbed via the five senses. This explains that the information presented or what can be referred to as the stimulus is firstly kept within the sensory register through the five senses. Though the information is registered in the sensory memory, it stays for a very short period of time (Atkinson & Shiffrin, 1968, p. 90). This period of time is measured in the ‘millisecond’; after that the information disappears (Atkinson & Shiffrin, 1968, p. 92). Different scholars agreed on the disability of the sensory memory.

Winfield & Byrnes argued that one shortcoming of the sensory memory is that it keeps the learned information for a very short period of time (1981, as cited in Banikowski & Mehring, 1999, p. 3). Kellog (2007) argued that without sensory register all the information would not be transferred to long-term memory and would be forgotten for good (p. 95). It was suggested that sensory memory is composed of seen and heard input exclusively, and it is divided into iconic and echoic memory as it is presented in the following figure (2007, p. 95).

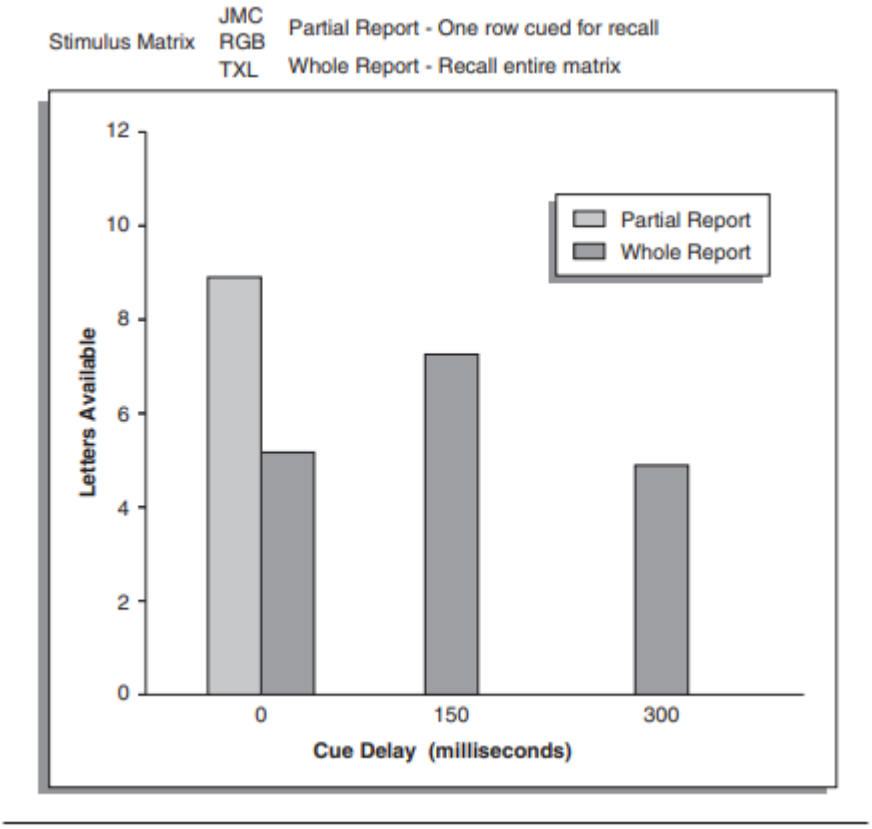
Figure 1.4. A Hierarchical Memory System: Components of Sensory Memory



Adapted from: Kellog, 2007, p. 95.

Sperling (1960) defined *iconic memory* as: "a pre-attentive store of visual information" (1960, as cited in Persuh, Genzer & Melara, 2012, p. 1). Kellog reported that "Sperling's work indicated that iconic memory has a large capacity—greater than what can be reported at once—and a duration of only about 250 milliseconds. Several later experiments by others suggest that the iconic store holds most, if not all, sensations registered by the retina for a brief period of time" (2007, p. 97).

Figure 1.5. Partial Report Task Used to Study the Capacity and Duration of Iconic Memory



Adapted from: Persuh, Genzer & Melara, 2012, p. 2.

Neisser (1967) explained that the auditory sensory system also stores information in the form of *echoic memory* (as cited in Kellog, 2007, p. 98). Kellog (2007) stated that "auditory sensory memory is called echoic memory; its duration is brief, but aural stimuli such as speech are also stored for longer periods of time in short-term memory" (p. 97). Cowan (1988) suggested that according to many cognitive studies, the echoic memory has two main phases of storage: the first one is the sensory storage which takes about 250 milliseconds, and the second one has a longer duration in comparison to the first phase (as cited in Kellog, 2007, p. 99). Javitt et *al* (1997) claimed that "echoic memories can be defined as very brief sensory memory of some auditory stimuli" (as cited in Sabiniewicz & Sorokowski, 2017, p. 82).

Other researchers suggested that sensory memory also comprises another type of memory concerned with tactile input that is described as 'the haptic memory'. For

instance, Pampori and Malla (2016) stated that: “haptic memory represents sensory memory for the tactile sense of touch. Sensory receptors all over the body detect sensations such as pressure, itching, and pain which get carried to post-central gyrus of parietal lobe through afferent neurons in spinal cord. Evidence for haptic memory has only recently been identified resulting in a small body of research regarding its role, capacity, and duration” (p. 336). Also, Heller and Ballesteros (2006) defined haptic memory as: “an ability to retain impressions of haptically acquired information after removing the original stimulus. It is based on touch described as an accurate and fast modality that allows to detect salient attributes of the spatial layout of tangible and unfamiliar objects” (as cited in Sabiniewicz & Sorokowski, 2017, p. 81).

‘The short-term store’ or short-term memory (STM) is the other essential element of memory, it is also known as the ‘working memory’ (Atkinson & Shiffrin, 1968, p. 92). Atkinson and Shiffrin (1968, p. 92) argued that the information entering the short-term memory (STM) is claimed to be kept for a little bit longer period than that of the sensory memory, then it disappears. One characteristic of the short-term memory is that it does not necessarily depend on the five senses; however, the information learned through the sight sense in the sensory register may be transferred into an ‘auditory’ input in the short-term memory (Atkinson & Shiffrin, 1968, p. 92). Additionally, Baddeley et *al* (2009) agreed that: “short-term memory is assumed to retain small amounts of material (4-7 elements) over periods of few seconds […] short-term memory is crucial part of general memory system, as it feeds information into and out of the long store. It is responsible for selecting and operating strategies and can also be used while being involved in complex activities” (as cited in Sabiniewicz & Sorokowski, 2017, p. 80). Pampori and Malla (2016) argued that short-term memory (STM) is the first stage of active memory,

and it has limited capacity of 7±2 items to be stored in a very short period of time (p. 337).

Finally, the other important component of memory is the long-term store or long-term memory (LTM). This one is different from the previously mentioned systems in that the information retained in this store is constant (Atkinson & Shiffrin, 1968, p. 93). Amin and Malik defined long-term memory as "the collection of material over long durations of time; includes unlimited amounts of information" (2013, p. 332). According to Pampori and Malla (2016), long-term memory (LTM) has a larger capacity to store particular information to be recalled later, and they added that: "long-term memories are maintained by more stable and permanent changes in neural connections widely spread throughout the brain. While short-term memory (STM) encodes information acoustically, long-term memory (LTM) encodes it semantically" (p. 338). Simply speaking, long-term memory has a greater retention ability more than short-term memory, and this mainly happen due to the consistency of the neural links. Moreover, STM deals with auditory information, and LTM deals with semantic input.

Anderson (1976) suggested that long-term memory is composed of declarative (explicit) memory, and procedural (implicit) memory (as cited in Pampori & Malla, 2016, p. 338). Riedel and Blokland (2015) argued that: "declarative Memory consists of memory for events (episodic memory) and facts (semantic memory) […]. Declarative memory involves the acquisition and retention of information demanding conscious or explicit learning" (p. 215-216). In addition, Pampori and Malla stated that "declarative memory requires conscious recall, in that some conscious process must call back the information. It is also referred as explicit memory, since it consists of information that is explicitly stored and retrieved" (2016, p. 339). Therefore, declarative memory or explicit

memory is that part of memory that is based on the concept of retaining facts and events that are said to be retrieved later on consciously.

Declarative memory is divided into four types of memory which include 'semantic memory, episodic memory, autobiographical memory and visual memory' (Pampori & Malla, 2016, p. 339). Semantic memory is concerned with the storage of facts without linking them with a specific context, while episodic memory is concerned with the storage of particular events that have context and cannot be recalled unless the context is available (Pampori & Malla, 2016, p. 339). Riedel and Blokland (2015) argued that semantic memory is about storing general information or knowledge of the external world (p. 216). Whereas, episodic memory has the responsibility to store the already experienced events in the form of episodes (Riedel & Blokland, 2016, p. 216). The autobiographical memory is the storage of events that are personal and related directly to the person holding them, while the visual memory is the retention of some features of human senses that are associated with visual experience (Pampori & Malla, 2016, p. 339).

Procedural memory can be also called implicit memory, and it is not about the conscious retrieval of certain information but rather about 'the implicit learning' that takes place without awareness (Pampori & Malla, 2016, p. 339). Pampori and Malla explained that "this type of memory is displayed when one does better in a given task due to repetition without formation of any new explicit memories, but unconsciously accessing aspects of previous experiences" (2016, p. 339). In view of this definition, procedural memory is concerned with the stored information that are expected to be recalled in unconscious way. Hayne et *al* (2000) reported that: "Procedural memory is less accessible to conscious awareness and enables gradual learning of habits and skills" (as cited in Quam et *al*, 2018, p. 2). In other words, procedural memory permits the

progressive acquisition of various skills and habits, eventually it is formed unconsciously.

1.2.3. Memory Retention Theories and Models

Many cognitive psychologists attempted to understand how the human memory works, and offered a variety of models and theories in this regard.

1.2.3.1. The Dual-Code Theory

The dual-coding theory is a theory was firstly developed for acknowledging the impact of both verbal and the nonverbal on the human memory. Begg argued that memory would be highly functional if both verbal and the nonverbal codes are involved in the process (1972, as cited in Sadoski, Goetz & Rodriguez, 2000, p. 85). Additionally, Begg claimed that various studies reported that concrete ideas are more memorable than the abstract ones (1972, as cited in Sadoski, Goetz & Rodriguez, 2000, p. 85). Clark and Paivio introduced 'the dual-code theory' which explains that people can maintain the knowledge learned in the 'long-term memory' via two different ways These two types are 'visual' and 'verbal' which in turn corresponds to 'episodic' and 'semantic' memory (1991, as cited in Banikowski & Mehring, 1999, p. 5). Hence, Clark and Paivio reported that retrieval of information would be more successful when the information is given both visually and verbally (1991, as cited in Banikowski & Mehring, 1999, p. 5).

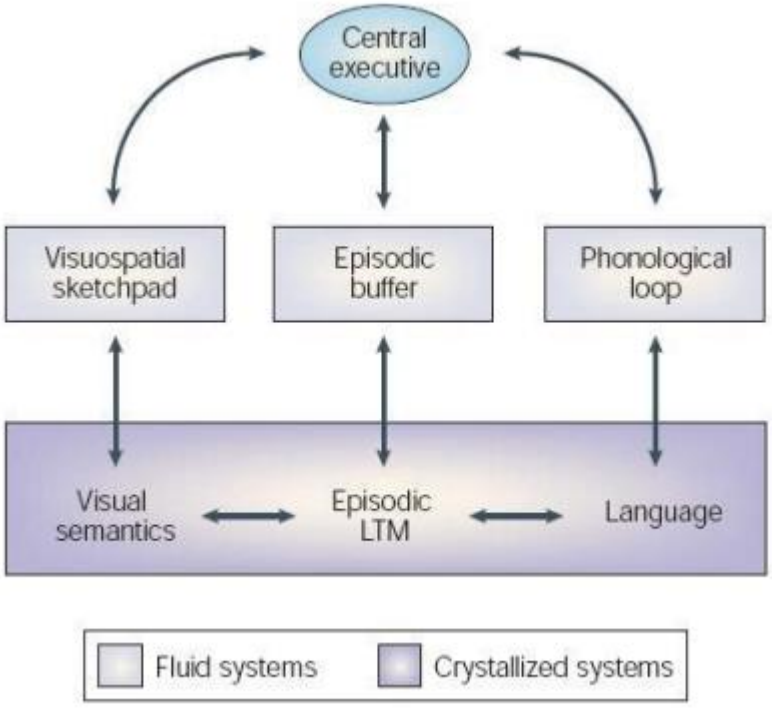
Accordingly, the dual coding theory is a theory that necessitates the use of both verbal and nonverbal codes. Therefore, one can recognize that information can be successfully recalled when it is given in both codes.

1.2.3.2. Baddeley and Hitch's Multicomponent Model

This model is based on the shortcomings of the model of Atkinson and Shiffrin (1968) that proposed the concept of working memory (as cited in Bablekou, 2009, p. 5). According to Bablekou (2009), the model has four elements which are: 'the central

executive, the phonological loop, the visuo-spatial sketchpad, the episodic buffer (p. 5). Pezzulo (2007) explained that the central executive is responsible for the performance of actions, the inclusion of relevant information along with the exclusion of irrelevant information, while the phonological loop is responsible for auditory input and visuo-spatial sketchpad is responsible for visual input, besides the episodic buffer which is responsible for the combination of all types of inputs (p. 2).

Figure 1.6. Multicomponent Model of Working Memory



Adapted from: Pezzulo, 2007, p. 2.

1.2.3.3. Cowan's Embedded-Process Model

Nelson Cowan is considered as the most influential figure in memory research, he developed a memory model (1995, 1999, 2005) through which he connected working memory to long-term memory in order to bring newness to the concept of working memory, and he focused more on attention, activation levels and expertise (Bablekou, 2009, p. 9). Cowan (2005) suggested that the interaction between working memory and

long-term memory occurs through the formation of some episodic ties among active items in long-term memory and some other processed items on the spot (as cited in Bablekou, 2009, p. 11). Gruszka and Orzechowski offered a thorough explanation to Cowan's model by stating that:

> In Cowan's view, working memory is understood dynamically, that is, as a cognitive process which is responsible for maintaining access to information necessary to carry out current tasks of the system. As in other theories, according to Cowan, working memory is a complex system. The author distinguishes two basic systems: the central executive system and a homogeneous memory system. Its homogeneity derives from the assumption that there are no sharp boundaries between short and long-term memory, and the evidence showing their separateness can be explained without postulating structural separation of memory subsystems. The results of simultaneous tasks, indicating – according to Baddeley – separateness of subsystems, can be explained by the phenomenon of interference occurring within the active information. (2016, p. 3)

Based on the aforementioned explanation, working memory is that entity of human brain that ensures the information accessibility in order or perform immediate tasks. Hence, working memory has dual system which makes it complex. This dual system involves 'central executive system' and 'homogeneous memory system'.

1.2.4. Factors Influencing Memory Retention and Recall

The processes of retention and recall are highly interrelated and interconnected, and they can be very significant in many areas; for example, education, assessment and evaluation, the limited ability of memory, attention and checking the degree to which the material taught is complex (as cited in Amin & Malik, 2016, p. 228). Though, retention and recall can be affected by many reasons which are 'attention', 'rehearsal', 'sleep',

‘testing’, ‘mnemonics’, and ‘reward’ (cognitive research studies, as cited in Amin & Malik, 2016, p. 228).

1.2.4.1. Attention

Amin and Malik (2014, p. 228) explained that the capacity of human memory is restricted to a specific amount of information; hence, humans must decide the most important information for them so that to be processed and then stored and retained. Unsurprisingly, attention one of the most influential factors that helps in selecting and processing information into the human memory (Amin & Malik, 2014, p. 228). Various studies addressed the relationship between memory processes and attention. One research showed that attention and memory work together, i.e. memory cannot work without attention and the vice versa (Chun & Turk-Browne, 2007; as cited in Amin & Malik, 2014, p. 228). Specifically, Chun and Turk-Browne declared that attention is essential in raising the performance of human memory (as cited in Amin & Malik, 2014, p. 228).

Moreover, another study by Dudukovic, DuBrow and Wagner revealed the differences in results among long-term retention with full attention and long-term retention along with divided attention (2009, as cited in Amin & Malik, 2014, p. 228). The former showed very convenient results in comparison with the latter. Consequently, divided attention may hinder the process of retention (Dudukovic, DuBrow, & Wagner, as cited in Amin & Malik, 2014, p. 228). Similarly, Fougnie investigated the relationship between attention and the process of memory retention (as cited in Amin & Malik, 2014, p. 228). He declared that a strong link existed between attention and retention in the working memory (Fougnie, as cited in Amin & Malik, 2014, p. 228). Accordingly, the previously mentioned experiments reported a strong relationship among attention and the processes of memory namely retention and recall.

1.2.4.2. Rehearsal

Amin and Malik (2014, p. 228) argued that rehearsal can be defined as the process of repetition of learned information or of what the learner has received; i.e. the same material, whether in a verbal or visual format. Different researchers studied rehearsal in accordance with memory retention and recall. Burgess and Hitch pointed out that information of a verbal nature can be stored in 'the phonological loop'; however, can disappear and decline in a bit if it is not rapidly rehearsed according to 'the phonological loop' model (as cited in Amin & Malik, 2014, p. 228). Therefore, rehearsal is not always successful for memory recall (Amin & Malik, 2014, p. 229).

According to Jonides (1984, p. 494), there are two main roles of rehearsal; the former is "to maintain information in a temporarily active state during short-term tasks and to create memory traces with some permanence". The other function "has often been attributed to the class of processes called "elaborative" rehearsal, processes such as chunking, forming images, or recoding material in various ways" (Jonides, 1984, p. 494). Gagne argued that there are different rehearsal skills which are helpful to improve retention in the short-term memory. These skills are 'reviewing at certain intervals', 'rereading', 'telling to another person', 'writing as it is' (as cited in Bıyıklı & Doğan, 2015, p. 312).

1.2.4.3. Sleep

Sleep and memory have been under research for the last decades, Potkin and Bunney (2012, p. 1) declared that sleep plays a crucial role in the process of 'memory consolidation'. Moreover, Amin and Malik (2014, p. 229) argued that 'memory consolidation' is associated with both processes of retention and processing of information. Identically, another study tackled the same topic of memory consolidation

and sleep. Additionally, Frank and Benington (2006, p. 477) reported that sleep is helpful in ‘memory consolidation’, and that sleep enhances the brain plasticity.

Consequently, sleep is an important factor for the empowerment of memory. Thus, the amount of sleep should be enough in order to reinforce memory to work better.

1.2.4.4. Mnemonics

According to Buzan (1974), argued that from the early periods of the Greek civilization, people were very skillful and talented in remembering huge amounts of information no matter the order was (p. 63). They had the capacity to store and retain in their memory ‘dates’, ‘numbers’, ‘names’ and ‘faces’ (Buzan, 1974, p. 63). Buzan claimed that these people utilized specific strategies for memorization; these strategies are called ‘mnemonics’ (1974, p. 63). Bellezza (1987, p. 34) argued that “mnemonic devices are techniques for memorizing that through experience over the centuries have been shown to be effective”. There are various mnemonic skills which are very useful in recalling knowledge without necessarily great effort namely ‘acronyms’, ‘acrostics’, ‘method of loci’, ‘chunking’, ‘rhymes and songs’, ‘stories’…etc (Bellezza, as cited in Amin & Malik, 2016, p. 230). Accordingly, mnemonics are a set of different techniques that are beneficial for the work of memory, and they work as facilitators for the storage of information.

1.2.4.5. Reward

Significant researches addressed the area of reward and punishment and the comprehension of the reward processing in accordance with the brain. One study revealed that long-term retention improved due to training under reward conditions (Abe *et al.*, 2011, p. 557). Also, Abe *et al.* (2011, p. 557) pointed out that retention decreased when the training was not followed with reward. For this reason, the study affirmed that learning would be more successful if it is backed up with ‘reward-based training’ (Abe

et al., 2011, p. 557). Therefore, one can come to the adequate conclusion that reward does affect the human memory, especially if it is presented after learning.

1.2.4.6. Testing Effect

Testing is considered one type of assessment and evaluation that is followed by many educational institutions in order to assess the knowledge acquired and studied by students (Amin & Malik, 2014, p. 230). Amin and Malik (2014, p. 230) argued that there have been magnificent researches that experimented the impacts of both studying and testing in relation to learning. The claimed hypothesis that learning occurs just through studying and tests are just tools for testing and measuring what has been learned is recently re-investigated. Roediger and Butler (2011, p. 25) found out that repetition of tests is much better than a single test. They also reported that testing should be followed with feedback of the results in order to have a great impact (Roediger & Butler, 2011, p. 25). Therefore, Roediger and Butler concluded that practices of recall through tests had substantial consequences in 'learning and long-term retention' then did studying alone (2011, p. 25).

All of the previously mentioned factors had been scientifically approved to be effective for the successfulness or the failure of memory retention and recall. Through experiments or studies, these factors had an impact on the way information is stored and later on retrieved.

1.2.5. Methods and Techniques of Memory Storage and Recall

Different scholars and researchers argued that there are different strategies and techniques that can be helpful for students in storing and recalling information. Davis, Sirotowitz and Parker argued that visualization is another effective method for retaining and retrieving information easily (1996, p. 75). Also, Atkinson and Raugh introduced the keyword method for the successful learning of vocabulary (1975, p. 126). Howes offered

different methods that can be used by students in memorization; these methods are ‘the link method’, ‘the storytelling method’, ‘the loci method’ (2015, as cited in Untoda & Gaspar, 2017, p. 11). Additionally, Raghunatan proposed another important method for memory storage called ‘chunking’ (as cited in Untoda & Gaspar, 2017, p. 11). Furthermore, Johnson claimed that acronyms, acrostics are considered as the best techniques that one can use in order to retain and recall the information learned very easily (as cited in Untoda & Gasper, 2017, p. 12).

1.2.5.1. Visualization

According to the chapter of study skills, our ability to store knowledge can be reinforced via visualizing images in our mind about that certain knowledge, this would make it easier to retrieve for the time it is needed (1996, p.75). Hoque argued that in order to remember information learned, try to create an image that relates to that specific concept (2019, p. 148). According to Hoque (2019), creating images is very significant due to its connectivity to the ‘visuospatial centers’ of the brain (p. 148). As Hoque (2019, p. 148) suggested that if you want to remember a state’s capital, that of Louisiana for instance, you may draw a girl, name her Louise, and draw her holding a red baton which signifies that the capital of Louisiana is Baton Rouge.

1.2.5.2. The Keyword Technique

In a study conducted by Atkinson and Raugh (1975, p. 126), they reported that the keyword method had substantial results on learning the vocabulary of a foreign language. Moreover, the keyword strategy is considered to be the most effective one when learning vocabulary; it was named so by Atkinson in 1975 (as cited in Siriganjanavong, 2013, p. 3). Furthermore, Siriganjanavong argued that the keyword method is very effective especially for students in order to store the new knowledge learned (2013, p. 3). Also, Siriganjanavong described the keyword method as a ‘two-step-approach’; mainly, for

learning new words of a foreign language (2013, p. 3). To clarify this more, Siriganjanavong (2013, p. 3) suggested that for learning words in Spanish. For instance, the word "**pato"** which refers to duck in English, and it is pronounced this way '**/pot-o/'**; thus, Siriganjanavong suggested that the keyword would be 'pot' which similar to the Spanish word (2013, p. 3). Following Siriganjanavong' description, the student can put the word in a sentence that associate it with its meaning. Accordingly, the student will better retain that specific word in his memory (2013, p. 3).

1.2.5.3. The link technique

The link method is considered among the most useful methods for storing and recalling information. Buzan (1971, p. 27) introduced a book entitled *Speed Memory* within which he proposes a list of methods and skills; which can be useful for enhancing the capacity of memory, i.e. storage and retrieval of information. According to Buzan (1971), people can improve their capacity of remembering through what is known as 'the Link method' (p. 27). He explained that 'link' method facilitates for you storage of a huge amount of information (Buzan, 1971, p. 28). While trying to remember everything without following a certain way in doing so, you can try to make associations between the information you have and certain things, objects.

1.2.5.4. Storytelling Technique

It is argued that whenever you have very prolonged pieces of information; just avoid learning it at the same time, and the best thing you may do is to divide the information into smaller segments and then you invent a story that links all these parts together (study skills made easy, p.80). For example, when trying to memorize names of the first ten presidents of the United States, you would better create a story that would connect together the presidents in the previously mentioned order. The example is as shown below:

> [Think of George Washington not only as our first president, but as somewhat of a klutz, always cutting himself; and so our story…]
>
> When **Washington** cut down the cherry tree, he also cut his **Adams** apple. Blood gushed all over his **Son, Jeff** (Jefferson). Jeff was **Mad** (Madison) at the **Money** (Monroe) fixing another **Adams** (another Adams) apple would cost. Along came the nicer **Son, Jack** (Jackson) to help, but his **Van Burned** (Van Buren) while **Hurrying** (Harrison) to the hospital, so they just temporarily **Tied** (Tyler) a bandage around the bloody wound. (Study strategies made easy, 1996, p. 78).

In this sense, storytelling is considered effective in cases of storing names. The way one creates a story to link these names can have an impact on the way s/he can recall it later. According to the above example, the way names of the presidents were linked to each other through a short story made it easier, simpler and achievable. In addition, McGregor and Holmes (1999, p. 404) claimed that Storytelling strategy is highly associated to memory in that way that it has an impact on it; also, the processing of information can be reinforced by the storytelling technique.

1.2.5.5. The Loci Method

The loci method is another method that is beneficial to retain and recall information. Ni and Hassan (2019, p. 94) argued that loci refers to the 'location', it is a strategy that works via connecting the things you want to remember with a specific 'location'. They used this example to explain more:

[w]e will create a presentation that contains three main topics. Each section of the presentation will be associated with a marker representing the presentation sequence. For example, we try to imagine a classroom. The flower pot in the corner of the classroom is the first thing we see when moving forward. We choose the flower vase to remind us of congratulations on lecturers and classmates in the classroom. The lights in the class are

selected to remind us of the next topic or the contents of the speech, and possibly the door of the class is selected to remind the closing part of the presentations we will convey (Ni & Hassan, 2019, p. 94).

Based on the previously mentioned example, the loci method is basically related to the identification of locations to specific pieces of information that one needs to store and recall for later processes. The loci method is remarkably a complicated method that needs lots of focus and selection of locations and forming the codes of those specific locations. Thus, students need to focus very well to succeed in accomplishing this method.

Furthermore, Allyn and Macon (1998, p. 4) argued that the loci method was previously used for the sake of memorizing speeches, it is a sort of a combination of the skills of 'organization', 'visual memory' and 'association'. The first step you need to do is that you decide a place or a path that you are going to walk in; for instance, you choose your room, your house or your favorite garden taking into consideration that you remember all the objects or things along this path (Allyn & Macon, 1998, p. 4). After that, you take the information that you want to remember and you try to associate it to the different objects, this would make it easy for you to recall specific information that has its specific marker or sign (Allyn & Macon, 1998, p. 4).

1.2.5.6. Chunking

According to Lah, Saat and Hassan (2014, p. 9), chunking is an essential technique that is beneficial to the short-term memory. Miller argued that chunking is the process of collecting different pieces of information so that it gives a general meaning; thus, it would be easy to retain it in the short-term memory (as cited in Lah *et al.*, 2014, p. 9). Also, the minimization and limitation of 'the cognitive overload' is the main function of chunking. Hence, the learner's capacity of retaining information is enlarged (Lah *et al.*, 2014, p. 9). Additionally, West, Farmer and Wolf argued that chunking is a technique that is

classified into three different types namely, ‘linear chunking’, ‘taxonomic’ and ‘multipurpose chunking’ (as cited in Lah *et al*., 2014, p. 9). ‘Linear chunking’ is said to be the process of arranging information chronologically whether on the basis of dates or places, ‘taxonomic chunking’ is the method of classifying information cognitively based on Bloom’s taxonomy. Finally, the ‘multipurpose chunking’ is related to the bulk of information learned or the absence of it (West et al., 1991, as cited in Lah et al., 2014, p. 9). Moreover, Banikowski and Alison offered a different version of chunking different from that of Miller, they divided twenty-four numbers into six parts. Therefore, these six pieces become easier to retrieve (as cited in Lah et *al*, 2014, p. 10). Another scholar reported that chunking is a helpful method for students in organizing the different chunks of information which in turn helps them in enhancing their Chinese language (Zhou, as cited in Lah et *al*, 2014, p. 10). Through the process of dividing the information into discrete units, the information then will be much easier to store and retrieve later (Badsha & Adhikary, 2017, p. 5126).

Although, the process of retraining and recalling information can be a difficult task especially for longer stretches of paragraphs, chunking is the method that facilitates that process through dividing up the information into smaller pieces that would make it easy for mind to store it and recall it later.

1.2.5.7. Acronyms

According to Davis, Sirotowitz, Parker (1997), during the memorization process, it is not a necessity that you memorize complete sentences but rather you may use the first letters of the sentence to create a single word that may be easy to retain and to recall in later times (p. 73). Davis et *al* suggested that in order to retain and store the names of the most well-known lakes in the world like ‘Huron, Ontario, Michigan, Erie, and Superior’, you can just takes the first letter of each of the following words and form one single word

(1997, p. 73). Consequently, the word HOMES will be formed out of the previously mentioned names (Davis et *al*, 1997, p. 73). Additionally, in order to be able to memorize 'the spectrum of colors', one can form 'ROY G BIV' out of the first letters of each one of the following colors: red, orange, yellow, green, blue, indigo, violet (Davis et *al*, 1997, p. 73). In short, acronyms are a method of memory storage and recall which aims at facilitating the process of retaining the necessary information and recalling it for later use.

1.2.5.8. Acrostics

An acrostic is another strategy that is really helpful in retaining and retrieving information whenever needed. Acrostics is a memory technique specifically meant for the memorization of longer sequences, in this memory you take the first letter of each of the items given and you create your own sentences as in the document, 'the sillier the better' (Davis et *al*, 1997, p. 73). Moreover, Ni and Hassan (2019, p. 94) suggested that the acrostic technique is based on the utilization of letters which makes the knowledge presented easy to remember. The acrostic method is different from the acronym strategy in that it is not necessary to use only the first letters and it is not only limited to single abbreviated word (Ni & Hassan, 2019, p. 94). For example, in order to learn the names of countries of Central America which are '**B**eliz, **G**uatamala, **E**l Salvador, **H**onduras, **N**icaragua, **C**osta Rica, **P**anama'; you may create a funny sentence using the first letters of these countries that would make it easier. According to study strategies made easy you can create the acrostic of the previously mentioned example as follows: '**B**ig **G**irls **E**at **H**ot **N**acho **C**hips **P**lain' (p. 73).

In sum, acrostics are beneficial and motivating methods for students especially because of their playful nature. An acrostic is the way through which students create simple, funny sentences out of the first letters of each item in the sentence. In addition, it

encourages students to use their imaginative skills to create and design their own memorable sentences.

1.2.6. The Effectiveness of Memory Training

Memory training is one of the biggest concerns of memory research and cognitive psychology, and specifically working memory training (WMT). Shipstead and Engle (2012) claimed that considering working memory as an important element of human memory gives it the opportunity to be developed through 'theoretically motivated techniques' (p. 5). They added that working memory training should not only teach particular strategies, but also enhancing a person's working memory score (2012, p. 5). Klinberg (2010) argued that working memory training should be focused on 'working memory tasks' in order to measure working memory capacity, and to improve the neural plasticity (as cited in Shipstead & Engle, 2012, p. 5). Shipstead and Engle concluded that the researchers concerned with human memory did not provide enough evidence to prove that working memory training (WMT) is very efficient in order to enhance memory capacity (p. 20).

Additionally, Melby-Lervåg and Hulme (2012) had the same conclusion as Shipstead and Engle in the sense that the current used working memory training programs do not have long-term effects which means that they are not durable (p. 14).

Conclusion

Information processing, retention and recall have taken a large part of research in the domain of cognitive psychology. Many psychologists offered plenty of literature in order to have a full understanding of how the human brain works and deals with different types of information (process, retain, recall). Human memory is considered as that faculty of the brain which is complex and subtle. Accordingly, many theories models, strategies were suggested since the emergence of psychology as a separate field. Noticeably,

memory has the largest portion of the written literature in regard to its significance and complexity. Cognitive researchers shed the light on the components of the human memory (SM, STM, LTM), their functions and what kind of information they treat.

As an attempt to enhance the memory capacity, working memory training programs were designed and applied to see their effect. Regardless to the apparent benefits of working memory training, there is no literature that confirms these benefits. However, a bunch of memory techniques were suggested in order to improve individuals' memory such as: organization, chunking, association…etc.

Chapter Two

Time Management Skills

Introduction

Time is one of the most crucial aspects of life, it is highly important in all spheres of life and especially for university students. As time management skills are very important for the students; they can use these skills and strategies in order to attain various aims. Also, they can use these skills efficiently and productively. Time management skills are dependable more or less on the manner students use them, and for what reasons they use them. As a university student, there are lots of responsibilities and tasks one needs to achieve. Since time is restricted and no one can control it, the best thing to do is to learn how to manage the time appropriately so as to achieve the necessary activities. Consequently, being able to manage and allocate your time effectively, gives you as a student the chance to accomplish various tasks at its appropriate deadline.

In light of the previously mentioned ideas, this chapter attempts to provide a detailed overview of time management skills as it covers almost all the definitions of time management skills. It also covers the different time management skills that are helpful in organizing the students' lives, in addition to time management skills training. Moreover, the chapter includes the role of technology in allocating and managing time. Furthermore, it covers almost all the methods of time management such as, the pareto principle, the pomodoro method…etc. The chapter also attempts to provide several ideas on how to deal with time management interruptions; as it attempts to offer an overview about the importance of time management. Finally, the chapter outlines the role of effective time management in information processing, retention, and recall.

2.1. Definition of Time Management

Time management (TM) has been an area of research for a long period of time, varying from daily life settings; which mean the general life to more specific aspects of

life, namely time management in the academic settings such as, universities and colleges. Bond and Feather (1988, p. 321) defined time management as "the degree to which individuals perceive their use of time to be structured and organized". Furthermore, Eilam and Aharon (2003, p. 306) claimed that time management (TM) is highly associated to both processes of 'planning' and 'regulation'.

Besides, Claessens et al. defined time management (TM) as: "the behaviors **t**hat aim at achieving an effective use of time while performing certain goal-directed activities" (2007, as cited in Grissom, Loeb & Mitani, 2015, p. 3). Generally, time management is defined as the tasks that necessitate the successful use of time in order to minimize the pressure and maximize the success (Claessens et al, 2007, as cited in as cited in Nadinloyi, Hajloo, Garamaleki, Sadeghi, 2013, p. 135). Likewise, Lakein argued that managing one's time consists of deciding about the things one needs; then, setting the goals which are necessary to accomplish one's needs, organizing the tasks in terms of priority; for example, from the most important to the least important, making a link between time and the activities, in addition to designing schedules and lists (as cited in Varlamova, 2008, p. 6). Additionally, Kenedy argued that time management equals 'self-management'; in essence, a person needs to be able to take decisions on how to designate his/her time properly in order to attain the needed goals (2009, as cited in Nadinloyi, Hajloo, Garamaleki, Sadeghi, 2013, p. 135).

Roberts et *al.* argued that TM includes multiple elements ranging from the successful identification of the goals that one wants to attain, accomplishing one's tasks at the designated time, utilizing time management equipments; namely, designing lists; also, trying to manage the changes and cope with them, designing plans and finally trying to allocate one's time effectively (as cited in Nadinloyi, Hajloo, Garamaleki, Sadeghi, 2013, p. 135). According to Tracy (2013), time management ™ is psychologically linked

to the idea of ‘the law of control’, which states that feelings of satisfaction may arose when a person has the feelings that s/he is taking charge of his/her life (p. 5). Similarly, negativity and feelings of dissatisfaction may arise when a person feels that s/he is not taking charge of his/her life (Tracy, 2013, p. 5).

Also, Time management (TM) can be defined as the abilities that one can possess for regulating his/her time and using it successfully in order to make his/her performance good and to be able to control one’s tasks; also, attain one’s goals (Wong, 2013, p. 74). Finally, it is claimed that time management is a set of simultaneous tasks that result in beneficial and successful production (Folasade, 2014, p. 15). Furthermore, Folasade defined time management as: “increasing both the efficiency and the effectiveness of individuals and organizations through the organization of tasks and events by using tools such as planners and computers, and techniques and processes such as goal-setting, planning and scheduling” (2014, p. 14). Moreover, Claessens, Van Eerde, Rutte, and Roe defined time management as the act of using time properly taking into consideration specific tasks to be achieved (as cited in Bahadori, Salesi, Ravangard, Hosseini, Raadabadi, Dana, Ameryoun, 2015, p. 159). Research has shown that time management is the process that includes the prioritization and planning of activities, the capability of avoiding procrastination and the tasks that you do not really need, and finally making use of time properly, and handling it effectively (Greenberg, 2002, as cited in Bahadori *et al*., 2015, p. 159).

2.2. Time Management Skills

Time management skills can be described as the strategies, techniques or simply the ways that people can rely on in managing and allocating their time in relation to what

corresponds to their needs and goals. Accordingly, EFL learners need to take into consideration the following skills in order to manage their time appropriately.

2.2.1. Prioritization

Prioritization is considered as one of the most crucial skills of time management since it gives the individuals the chance to organize time and tasks based on priority. According to Tracy (2013), the 'ABCDE' method is one of the most effective tools that one can use in order to organize and manage his time along with the tasks in terms of priority (p. 41). He argued that the method includes the following elements; firstly, one needs to start by jotting down all the tasks s/he is asked to do. After that, one needs to state next to each task one of the following letters; whether A, B, C, D, or E (Tracy, 2013, p. 36). Tracy claimed that when A is written next to the task or tasks, it means that these tasks are the one that must be done, and these tasks are highly important. When B is written next to a task, it means that it is the task that should be done; these tasks are less important than the A tasks. Then, when C is written next to a tasks or tasks, it means that these tasks are the one that are nice to be done, these are the tasks that you can simply get rid of them (Tracy, 2013, p. 36).

Furthermore, Covey claimed that not all the tasks should be given equal treatment mainly because tasks vary in their nature. Hence, he suggested what is called 'Time Management Matrix', within which he distinguished between four types of tasks such as: 'important and urgent', 'important but not urgent', 'not important but urgent' and finally 'not important and not urgent' so that people can organize their tasks in terms of priority (1989, as cited in Vaden, 2015, pp. 16-17).

2.2.2. Scheduling and Planning

Scheduling and planning are one of the many skills of time management, using such skills can help people in organizing and allocating their time. Scheduling simply means

the act of making schedules. Britton and Tesser (1991, p. 407) identified three components of time management and these factors are linked to the skill of planning. The first is 'Short-Range Planning'; it is called so because it is comprised of a set of activities that need to be planned in a short period of time; for example, on a daily or weekly basis. The second component is called 'Time Attitudes'; from its name it is clear that it is related to the students' attitudes. When the time attitudes are high or positive, it means that the student feels that s/he is in control of his/her time. The third component is the 'Long-Range Planning'; which is the students' capacity to organize and plan for the tasks in the long run (i.e. on a monthly basis or the quarter of the year).

Moreover, much time should be dedicated to 'personal planning', so that it gives better results (Noon, 1983, as cited in Richards, 1987, p. 75). Richards that whenever people decide to spend some time on 'personal planning', they can choose from a multiplicity of choices (1987, p. 76). He claimed that people can make a daily list that they should check instantly; in addition to writing on it every weekend for example (Richards, 1987, p. 76). Also, people can rely on a second choice: they can use a 'plan sheet' as the one used by economy department, this plan constitutes a number of categories entitled as following: 'phoning', 'writing', 'general', 'meetings', 'lunches', and finally the 'names' (Mackenzie ,1972, as cited in Richards, 1987, p. 76).

Furthermore, Wong argued that there are certain types of schedules including term, weekly, and daily schedules (2009, p 97). She claimed that schedules which are perfectly designed can act as a guide whether in day to day tasks, weekly or monthly. Through scheduling one becomes able to plan, manage and set his/her goals (Wong, 2009, p. 97). Schedules are the most suitable way for how one wants to spend his/her time (Wong, 2009, p. 97). She added that a 'term schedule' is a monthly plan that includes the tasks, activities and events along with the deadlines at which these tasks must be done in that

specific term (Wong, 2009, p. 97). The second one is ‘the weekly schedule’, within which the emphasis and focus are placed on the tasks, activities and events of the following weeks (Wong, 2009, p. 98). In addition, one idea that is worth mentioning is that the weekly scheduling should be made before one starts his/her activities (Wong, 2009, p. 98).

Finally, Wong claimed that ‘the daily schedule’ is the kind of list which specifies the activities and tasks that one needs to accomplish in day to day (2009, p. 105). In particular, Wong asserted a daily “To-Do List” that can be helpful for one through the daily activities (2009, p. 105). Similarly, Tracy argued that “the daily “To-Do List” is the most powerful time management tool; it is a daily list of activities that one can create to serve as a blueprint for your day” (2013, p. 34).

Example of a Weekly Time-Management Schedule

WEEKLY TIME-MANAGEMENT SCHEDULE

For the week of _____

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
12–6 AM	SLEEP						
6–7:00	SLEEP						
7–8:00	Get up, get ready, eat breakfast					SLEEP	SLEEP
8–9:00	Commute to school					Get up	Get up
9–10:00	PE Class	Study Math	PE Class	Study Math	PE Class	Breakfast	Breakfast
10–11:00	Math Class	Math Class	Math Class	Math Class	Study Math	Career Class	Get ready
11–12 NOON	Study Math	LUNCH	Study Math	LUNCH	with TUTOR	Study Career	CHURCH
12–1:00	LUNCH	Computer Class	LUNCH	Computer Class	LUNCH	ERRANDS	CHURCH
1–2:00	Reading Class	Computer Class	Reading Class	Computer Class	Reading Class	LUNCH	LUNCH
2–3:00	Study Reading	Lab-Study Computer	Study Reading	Lab-Study Computer	Study Reading	CHORES	LEISURE
3–4:00	Study Reading	Lab-Study Computer	FLEX	Lab-Study Computer	FLEX	CHORES	LEISURE
4–5:00	Commute home					CHORES	LEISURE
5–6:00	DINNER						LEISURE
6–7:00	LEISURE	LEISURE	LEISURE	LEISURE	WORK	WORK	DINNER
7–8:00	Study Reading	WORKOUT	Study Math	WORKOUT	WORK	WORK	Study Math
8–9:00	Study Reading		Study Computer		WORK	WORK	Study Computer
9–10:00	LEISURE		LEISURE		WORK	WORK	FLEX
10–11:00	LEISURE		LEISURE		WORK	WORK	PLAN WEEK
11–12 AM	SLEEP				WORK	WORK	SLEEP

Figure 2.1. Example of a Weekly Time-Management Schedule

Adapted from: Wong, 2009, p. 99.

2.2.3. Goal Setting

People around the world juggle different roles at the same time; consequently, they have many tasks to be accomplished. Thus, they need to identify goals, write them and finally try to achieve them. In the process of measuring time management, Macan,

Shahani, Dipboye, and Phillips identified three elements of time management which are correspondent with the description that Lakein offered about time management (1990, as cited in Macan, 1994, p. 381). The former element is 'the setting of goals and priorities', the second one is 'the mechanics of time management', the latter is 'a preference for organization' (Macan, Shahani, Dipboye, and & Phillips, 1990, as cited in Macan, 1994, p. 381).

According to Wong (2009, p. 108), goals are considered as plans which are designed to attain the desired results; they mirror what you are actually passionate with and what you consider as important. She also explained that goal setting and time management are interrelated concepts, and that managing one's time effectively necessitates successful goal setting (Wong, 2009, p. 108). Setting goals can take three different dimensions. The first one is Long-term goals (LTG), the second one is the intermediary goals (IG), and finally the Short-term goals (STG) (Wong, 2009, p. 108). She further goes on to say that one needs to attain his/her short-term goals in order to achieve the intermediary goals, and that one cannot achieve the long-term goals unless s/he accomplish the intermediary ones (Wong, 2009, p. 108).

Most of people who wish to achieve their goals face many obstacles due to the poor strategies and procedures they follow in doing so. For this reason, Wong (2009, p. 110) introduced 'The Four-Step Approach for Achieving Goals'; which is the act of using certain steps to attain some goals. These steps are: 'Specific', 'Target', 'Steps' and 'Reward'. The first strategy is to set specific goals, within this step one must identify the goals according to the time at hand). Secondly, Wong (2009, p. 111) argued that usually 'procrastinators' act as a barrier to attaining goals; for this reason, people need to set specific time to achieve a certain goal. Also, by doing so people become motivated to finish all the stages or tasks included in that goal before time is over (Wong, 2009, p.

111). In the third step, one need to set and identify clearly the steps you should follow to accomplish your goal, or s/he can simply divide the general goal into several specific ones which would be much easier to be achieved. Finally, you may encourage yourself to achieve your goals by simply planning for rewards (Wong, 2009, p. 111).

Wong claimed that in regards to goal-setting, there are two types of rewards: extrinsic and intrinsic. The former is the kind of gifts, presents or simply the things you wish to do that are granted to you after completing your goals; while, the latter can be considered as the feelings and emotions that you will have after achieving your goals; these may include feelings of satisfaction, happiness, confidence (2009, p. 111).

2.2.4. Organization

Organization is another skill of managing time appropriately and is considered as a crucial skill for allocating time. It refers to the process of organizing along with reordering and rearranging what is not organized and jumbled in order to make it easy for you to recall what is needed when it is needed (Harold, 2012, as cited in Folasade, 2014, p. 14). According to Folasade (2014, p. 14), time management and organization are two intertwined significant concepts because being disorganized drains lots of time.

2.2.5. Statement of Long-Term Goals

Goal setting is considered as the procedure of deciding on and setting up goals and objectives that are clear and achievable in education, i.e. teaching and learning (Moeller, Theiler, & Wu, 2012, p. 153). There are two essential theories for assessing goal and goal-setting which are ‘Achievement Goal Theory’ (AGT), and ‘Goal Setting Theory’ (GST). The former originates from the field of research and education; however, the latter has its origins in the field of ‘organizational psychology research’ (Miller, 2018, p. 2). Research explored other types of goals that are linked into language learning. In this

regard, these goals are ‘mastery goals’ (MG) and ‘performance achievement goals’ (PAG).

Weiner suggested that ‘mastery goals’ trigger and encourage a more in-depth engagement and participation which in turn results in connecting both ‘effort’ and ‘achievement’ (1979, as cited in Moeller *et al.*, 2012, p. 154). However, performance achievement goal (PAG) is mainly related to the idea of steering clear of failure (Nicholls, Patashnick, & Nolen, 1985; Covington, 1984; Dweck, 1986; Dweck & Leggett, 1988; Elliott & Dweck, 1988; Nicholls, 1984, 1989; as cited in Moeller et al., 2012, p. 154). According to Moeller et al. (2012), students who use such goals are those whose main focus is on the outcomes, chiefly how they are evaluated (p. 154). Moreover, with the use of ‘mastery goals’ (MG), students will be able to discover and develop new skills.

Also, they will learn to rely on themselves in accomplishing their work (Bophy, 1983; Meece, Blumenfeld, & Hoyle, 1988; Ncholls, 1989; Ames, 1992a, as cited in Moeller *et al.*, 2012, p. 154). The America Council on the Teaching of Foreign Languages (ACTFL) is an institution that was created by a group of educators…etc.; which focuses chiefly on developing and fostering languages’ teaching and learning (ACTFL, 2004, as cited in Miller, 2018, p. 5).

This (ACTFL) organization introduced and offered a multiplicity of principles that are necessary in L2 classrooms. Due to these standards, the (ACTFL) created five sound bases for goals, which are known as the ‘5 Cs’. These ‘5 Cs’ are: ‘Communication’, ‘Cultures’, ‘Connections’, ‘Comparisons’, and ‘Communities’. These factors are very important for determining the students’ results and for the process of goal setting especially in L2 classrooms (ACTFL, 2004, as cited in Miller, 2018, p. 6). Additionally, the term ‘SMART’ goals are usually used to refer to simple goals, and

objectives. There are certain ways to make ‘SMART’ goals look smarter (specific, measurable, achievable, realistic and time-bound). In this respect, the first thing you need to do is to set clear and specific goals that are related to a specific element; then this goal must be something that you can measure so that they can be easily accomplished. After that, when setting goals, you must take into account that it is something that you can attain in the allotted time. Also, these goals must be relevant and realistic to satisfy the needs of a specific course or lesson (MTD Training, 2010, p. 70).

Additionally, the goal must be regulated by time, i.e. it must be achieved in the designated time (Macleod, 2012, p. 68). Besides, Locke offered a theory about goal setting that is known as ‘Toward a Theory of Task Motivation and Incentives’ (1968, as cited in MTD Training, 2010, p. 17). This theory suggested that when goals are competitive and challenging, people’s work will improve (Locke, 1968, as cited in MTD Training, 2010, p. 17). Moreover, Locke in collaboration with Latham, introduced ‘the Theory of Goal Setting and Task Performance’ which included five components that are: ‘clarity’, ‘challenge’, ‘commitment’, ‘feedback’, ‘task complexity’ (1990, as cited in MTD Training, 2010, p. 17).

2.3. Time Management Skills Training

McCay evolved the idea of time-management training program, which remains being used, and primarily includes several critical factors such as giving insight into time-consuming activities, changing time expenditure, and enhancing workplace efficiency by teaching people how to make day-to-day planning, how to prioritize tasks, and how to deal with unexpected tasks (1959, as cited in Claessens & Eerde, 2007, p. 256).

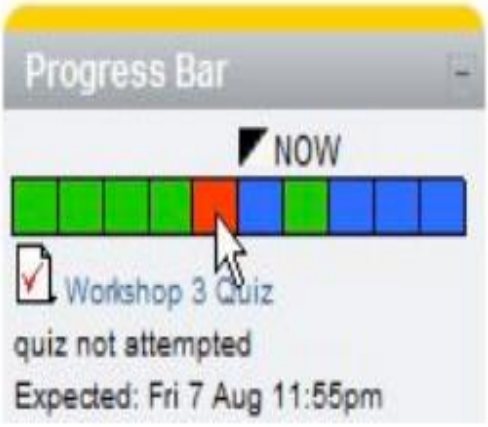
Furthermore, Orpen carried out an experiment wherein a self-advanced time management scale was applied. The results showed that the participants of the training group rated their time management abilities higher than the control group (1994, as cited

in Claessens & Van Eerde, 2007, p. 267). A diary study showed that participants made greater effective use of their time than the control group did, as rated by using managers who studied their tasks' diaries (Claessens & Van Eerde, 2007, p. 267). Whereas, Macan (1996) observed that time management behaviors did not improve after the training program which is compared to a control group where the participants enhanced their time management skills once they had participated in a time control program (as cited in Claessens & Van Eerde, 2007, p. 267). Van Eerde (2003) deduced that time management training program significantly multiplied participants' time control behaviors and decreased time anxiety and procrastination in terms of a control group (as cited in Claessens & Van Eerde, 2007, p. 267).

2.4. The Role of Technology in Time Management

According to Corlett et *al* (2004), many university students make use of smart phones, tablets, laptops and computers in order to manage their time effectively (p. 162). de Raadt and Dekeyser (2009) emphasized on the importance of time management technological tools of students to enhance their academic performance regardless of their academic outcomes (p. 194). They suggested Progress Bar app as an effective tool to encourage students' time management through giving them a summary about their progress in tasks' completion (2009, p. 194).

Figure 2.2. Progress Bar



Adapted from: de Raadt & Dekeyser, 2009, p. 194.

Recent task listing and organizing applications might also have 'built-in task hierarchy' (tasks containing sub-tasks) which support multiple techniques of filtering and organizing the pre-determined listing of tasks, and can also allow one to associate extended notes for each activity in order to facilitate it (Managing Time, 2011, p. 66). In comparison to the idea of allowing the individual to use more than one filtering technique, as a minimum one new software program product that carries a mode wherein the software will try to dynamically determine the activities for any given moment (Managing Time, 2011, p. 66). Many of the software program products for time management support more than one customer. It allows the presentation of tasks to other users and uses the software for communication. In law firms, regulation practice control software program may additionally also help in time management (Managing Time, 2011, p. 66). Time management applications software is oriented to manage and associate the computers' abilities, however; it does not accomplish the tasks instead of the user, but it serves the application which in turn serves the user (Managing Time, 2011, p. 66).

Accordingly, time management applications have been divided into three categories that would positively result in a better time control. These categories are: time tracking software, time tracking/recording software and timesheet software.

2.4.1. Time Tracking Software

Time tracking software is a category of computer software that permits its applicants to know the time spent on each task which is used by many industries, commonly that hire hourly workers, and it represents an electronic version of the traditional timesheet papers (Aliyu, 2011, p. 8). Tracking time can permit the multiplication of productivity, as businesses' practitioners better understand what business practices that cause wasting time, and this kind of software encourages controlling big businesses, and permits for enterprise owners to hold all-time records in a primary location (Aliyu, 2011, p. 9). Many time tracking software companies offer workforce control programs that consist of 'time and attendance, scheduling, absence control, human resources, payroll, talent management, and labor analytics' (Managing Time, 2011, p. 88).

2.4.2. Time Tracking/Recording Software

The second generation of time tracking software is the time tracking/recording software that automates the process of time tracking through recording what, when, how and for how long different tasks are performed (Managing Time, 2011, p. 89). The concept of this type of software is to get the actual picture about computer usage whereby time tracking/recording software indicates applications, documents, games, web sites usage (Managing Time, 2011, p. 90).

2.4.3. Timesheet Software

Timesheet software is a category software program used to uphold timesheets that are considered as the primary wave of the time tracking software when computer systems came to many offices, with the intention of replacing all heavy paperwork (Sindhgatta et *al*, 2010, p. 2). The Timesheet software program allows recording time spent on performing particular tasks whilst working; for instance, when such software is used in companies, employees enter their time into a digital timesheet, which can then be

accepted or rejected with the aid of supervisors or people in charge, also the timesheet software program moved to be mobile-based application and became more personalized, as an example tracking time for each activity individually (Sindhgatta et *al*, 2010, p. 3).

2.5. Methods of Time Management

According to Covey et *al* (1994), time management is not an isolated concept that stands by its own, but rather it is a subset of other concepts which can include project management, attention management, and personal knowledge management (p. 71). Also, he provided a dichotomy for time management through which four generations are to be taken into account (1994, p. 73). First generation comprises reminders such as clocks and watches, and with the invention of computers, it became easier for people to remind them with assignments that need to be done. Second generation is based on the use of calendars and appointment books in order to make plans and set goals for each plan. Third generation is about planning, prioritizing, and controlling various tasks and activities on daily basis through the use of laptops and personal organizers. Fourth generation encompasses the effective utilization of all tools mentioned above, and the prioritization of important and urgent tasks (Covey et *al*, 1994, p. 74).

By using conventional time management methods, the available time can be used in an efficient way, but as a second step it is crucial not to spend the saved time to get more activities to be done, however to apply it in particular for creating a work-existence balance: relaxation, growth, own family, and partnership. Hence; from a personal experience, it is remarkably important to do things right (efficiency) and to do the proper things (effectiveness).

2.5.1. The Pareto Principle (The 80:20 Rule)

According to Grosfed-Nir, Ronen and Kozlovsky (2007 p. 2317) the Italian economic expert and social scientist Vilfredo Federico Pareto (1848-

1913) developed the Pareto Principle which is named after him. Pareto discovered such principle in the early twentieth century when he realized that in Italy 20 % of families owned 80% of national wealth. So, this principle is based on the idea that 80% of the desirable outcomes could be obtained only in 20% of the devoted time (Grosfed-Nir, Ronen & Kozlovsky, 2007, p. 2318). Pareto analysis is a formal approach useful wherein many viable tasks and activities are competing for attention (Grosfed-Nir et *al*, 2007, p. 2318). Essentially, the problem-solver predicts the outcome delivered by each action, then selects some of the suitable actions that add a total benefit logically close to the highest possible one (Grosfed-Nir et *al*, 2007, p. 2318).

In this regard, Grosfed-Nir et *al* explained that the Pareto principle or analysis is an original way to find out the main motives of problems due to the fact that it vails the path for critical thinking and arranging one's own thoughts (2007, p. 2318). However, it can be confined by the usage of its exclusion of probably important issues which may be small initially, but they would be exposed to growth through time. It should be associated with other analytical techniques which incorporate failure mode and outcomes evaluation and fault tree analysis (Grosfed-Nir et *al*, 2007, p. 2318).

This method attempts to find out the major reasons that need to be solved, and eventually solving the majority of problems, and once the fundamental motives are identified, then system like the Ishikawa diagram or Fish-bone Analysis can be used to perceive the root motives of the problems (Grosfed-Nir et *al*, 2007, p. 2320). Hence, it is allowed to conclude that 20% of reasons decide upon 80% of troubles, however; this ratio is merely a simple rule that can be subject to change and it should not be considered as an unchangeable formula (Grosfed-Nir et *al*, 2007, p. 2322).

The Pareto Principle is a powerful time management approach for deciding about priorities and prioritizing tasks, for figuring out scheduling issues at early stages, and for

establishing a concrete plan for work (Diane, 2012, p. 112). In order to correctly practice the Pareto Principle, it is important to be capable of checking one's own skills and degree of performance; primarily by articulating the goal and separating the essential from the unimportant. Then, by identifying strengths and weaknesses and apprehending the achievement elements that enable the individual to obtain 80 percent of the goals via making use of the Pareto principle with 20 percent of the allocated time (Diane, 2012, p. 120).

2.5.2. Pomodoro Method (Tomato Method)

Cirillo (2013) decided on a simple device to assist him with time management, a kitchen timer; which was in the form of a tomato, and this latter is called in Cirillo's native language (Italian) Pomodoro Technique (as cited in Burton, 2016, p. 95). Based on tips from Zahariades (2015) and Carter (n.d.), Burton bought a mechanical kitchen timer that sat on his desk at the same time as he was working, and he paid attention to the tick tocks of the timer as he progressed through his task (2016, p. 95). For him, the bodily presence of the timer and the audible sound of time passing serve as regular reminders to stay focused on the challenge he actually chose (Burton, 2016, p. 95).

More deeply, Burton argued that the core idea of the Pomodoro Technique is the creation of focused timed periods during which a person must concentrate on a single activity. Mainly, the Pomodoro technique starts with creating a list of tasks and activities a person needs to finish and estimate how much time it will take him/her to finish each one, and then he/she prioritizes the important ones (Carter, n.d, as cited in Burton, 2016, p. 95). Next, the user of the Pomodoro technique should determine the length of the Pomodoro session s/he may complete (Carter, n.d., as cited in Burton, 2016, p. 95). Burton suggested for the ones new to the Pomodoro Technique commonly endorse Pomodoro periods of twenty-five (25) minutes with five minutes break (2016, p. 95).

Additionally, Zahariades (2015) claimed that the Pomodoro technique is highly beneficial since it limits the amount of time the brain has to stay focused, it diminishes the tendency to procrastinate, it avoids the problems of multitasking, and it pushes people to complete their tasks rather than just working on them (as cited in Burton, 2016, p. 96).

2.5.3. The POSEC Analysis

Lakein explained that the acronym POSEC stands for Prioritizing through Organizing, Streamlining, Economizing and Contributing (1989, p. 64). POSEC time analysis' primary guideline is that for one to be capable of handling tasks that s/he has to get them done, one needs to first bring to attention his/her daily personal responsibilities which involve the right use of time management skills (Lakein,1989, p. 63).

The POSEC method is centered upon the idea of breaking down the big goals into smaller goals properly, but not all of them. Primarily, The POSEC method is based on "Needs Hierarchy" (NH) developed by Abraham Maslow, and it suggests prioritizing these smaller goals, so that accomplishing the ultimate goals.i.e. It is a matter of successfully finishing these simplified responsibilities one step at a time. In other words, the POSEC method of time management provides directives for assisting individuals to arrange their objectives by means of importance and priority (Managing Time, 2011, p. 48).

First, the POSEC method starts with prioritizing the responsibilities according to the pre-defined set of aims and prioritizing the allotment of time, and this could imply that addressing day-to-day activities within the order of their importance. Accordingly, this will lead to the creation of 'personal efficiency', and enhance the effectiveness of collaborative work (Tracy, 2004, p. 220). Second, here comes the phase of organizing the set of objectives which have to be executed on a regular basis (Tracy, 2004, p. 221). As Tracy stated, the organizational phase gives people a sense of security and freedom

when the fundamental needs of food, shelter and clothing are successfully met (2004, p. 221). Third, there are some routine tasks that no one wants to do them such as the household chores, but they have to be done through streamlining which typically involves making these chores simpler than they seem (Tracy, 2004, p. 222). Fourth, creating economy has to do with activities that people need to or would really like to perform, however; they are not urgent. Some tasks related to economizing include acquiring new skills, collaborating in initiatives, and working on 'the personal development'.

Tracy argued that the tasks previously cited are considered the less vital ones and, therefore, are located at the end of the list of priorities (2004, p. 222). Last, contribution take place when focusing on tasks that do not bring that much of outcomes and time consuming as well, but they have a long-term positive impact on humanity (Tracy, 2004, p. 224).

2.5.4. The Pickle Jar Method

The pickle jar method is another beneficial method for managing time. According to Olubor and Osunde (2007) the Pickle Jar method is considered as the newest method of time management that was, elaborated by Jeremy Wright in 2002 (as cited in Nwabueze, Edikpa & Chukwuma, 2018, p. 21984). Wright (2002) argued that the Pickle Jar method is perfectly applied when people use "an effective time management system" to find a balance between different tasks and responsibilities ((as cited in Nwabueze, Edikpa & Chukwuma, 2018, p. 21985).

Jinalee and Singh (2018) suggested that each individual must be quite acquainted with the pickle jar's story (p. 145). They added that the pickle jar method is a simple one yet it brought a significant contribution to time management. This method is comparable to our life in which sand, pebbles and rocks inside the jar have their own meanings (Jinalee & Singh, 2018, p. 145). The rocks constitute the most important vital activities

that have serious consequences if not carried out on time, while the pebbles represent the daily tasks with average importance, and the sand represents unimportant tasks like phone calls, emails, social media notifications which means that sand denotes distracting activities (Jinalee & Singh, 2018, p. 145).

Jinalee and Singh (2018) clarified that if the jar is filled with sand first, there may be no space for the pebbles and rocks, and if the jar is filled with pebbles, there is some area for sand but no space for the rocks, however; if the jar is full of rocks first, pebbles second and sand at last, there will be space for all the elements (p. 145). This denotes a simple rule that if one fulfils the foremost tasks first, there could be the sufficient time to finish other tasks (Mulder, as cited in Jinalee & Singh, 2018, p. 145).

2.5.5. The ALPEN Method

ALPEN method is one of the beneficial time management techniques that are based on planning daily/weekly tasks with the aid of chunking complex ones into simpler parts (Jinalee & Singh, 2018, p. 144). The ALPEN method has certain stages to be followed in order to manage the available time in an effective manner. The user of this method should begin with listing the daily/weekly ‘Activities’, and grouping them into categories, then s/he should go for ‘Length Estimation’ phase through which the time dedicated for each and every activity would be predicted approximately (Jinalee & Singh, 2018, p. 145). Jinalee and Singh stated that planning comes as further step to divide the available time whereby 60% ought to be reserved to accomplish the pre-planned activities, and the remaining 40% ought to be reserved to the unexpected circumstances (2018, p. 145).

As a pillar to time management notion, establishing priorities is a crucial phase that enables the individuals to distinguish between the important and unimportant tasks, hereafter the ‘Next day’ phase would take place through verifying at the end of the day

the accomplished activities and checking if all the aims are fulfilled appropriately or not (Jinalee & Singh, 2018, p. 145). Panayotova *et al* (2015) argued that when applying the ALPEN method, all the five steps must be kept in mind for constructing a positive attitude toward the concept of time management, which in turn can reduce time anxiety and improve efficiency (as cited in Jinalee & Singh, 2018, p. 145).

2.5.6. Covey's Time Management Grid

Covey designed what is called 'time management grid'; its main function is to set priorities in four areas' design (2013, as cited in Jinalle & Singh, 2018, pp. 143-144). Covey claimed that the first area consists of the most important and the instant activities, the second area as covey insisted that it is composed of important tasks but that are not necessarily of an immediate nature. The third area consists of the tasks that people want to accomplish very quickly but they do not matter a lot. Finally, the last area which combines together the tasks and activities that are neither important nor urgent, but they are the tasks that are done in order to take a rest from the daily pressures (2013, as cited in Jinallee & Singh, 2018, pp. 143-144).

Jinallee and singh offered two different ways on how to use covey's 'time management grid', the most common way to utilize the grid is to bring your to-do list and then you spot all the activities on their areas according to their nature of importance and immediacy, then a process of assessment is necessary (2018, p. 144). The other way to work with this grid is called the 'one-week assessment strategy'; within this one' s task is to design six copies of the grid, each copy should be dedicated to only one day of the week along with the tasks and the time required for those tasks (Jinalle & Singh, 2018, p. 144). In the last day of the week you collect all the five copies you have already filled and you summarize them on the sixth copy of the grid. According to Jinalle and Singh (2018), after finishing all of these steps, you come into a final step which is the

step of evaluation where you evaluate and assess the time spent and you find out whether you time is spent very well or not (p. 144).

Figure 2.3. Covey's Time Management Grid

Particulars	Urgent	Not urgent
Important	Quadrant I Urgent and important activities	Quadrant II Not urgent but important activities
Not important	Quadrant III Urgent and not important	Quadrant IV Not urgent and important

Adapted from: Jinallee and singh, 2018, p. 143.

2.5.7. Parallel Programming

Parallel programming is another effective method of time management. Molaee, Azadzadeh and Dortaj claimed that parallel programming combined together a multiplicity of skills which are of a 'cognitive', 'metacognitive', 'physical' along with an 'emotional' nature (2014, as cited in Jinalle & Singh, 2018, p. 144). The core function of this method is to organize all of your tasks and activities in an aligned way in the same period of time. Thus, we can say that this method can be very helpful for students who juggle many roles and activities (Molaee *et al*., 2014, as cited in Jinalle & Singh, 2018, p. 144).

2.5.8. The Eihsenhower Matrix

Good time management necessitates efficiency. To accomplish the things, one needs to attain in a very limited period of time. One needs to make a clear differentiation between the most important tasks and the urgent ones. Once the difference is clear, managing time becomes easier. According to Jinalle and Singh (2018), the Eihsenhower

Matrix shares lots of commonalities with Covey's 'time management grid' (p. 144). Both methods have four areas that stress the same functions; however, one difference must be stressed. In the 'Eihsenhower matrix' the fourth area can be simply neglected and removed because the activities in this quadrant are considered as time-wasters (Jinalle & Singh, 2018, p.144).

2.5.9. The Salami Slice Method

Tracy (2013) highlighted that a distinguishable variant of the 'bite-size pieces' method for dealing with procrastination issues is called the Salami Slice Method (p. 69). This method emphasizes that a person cannot accomplish a huge task in a determined period of time, just as s/he would not eat a loaf of salami in a single bite (Tracy, 2013, p. 69). Instead, Tracy stressed that the task should be 'salami-sliced' into small sub-tasks to be done in separate periods of time, then these small sub-tasks would be finished earlier to save more time for other prior tasks (2013, p. 69). He further explained that if the tasks are overwhelming and stressing, it is better to finish one part of the task in a time (Tracy, 2013, p. 70). Eventually, once the first part is accomplished, it would be easier to deal with the other parts (Tracy, 2013, p. 70).

2.6. Time Management Interruptions

According to Miyata and Norman interruptions are: "breaks in the action that introduce new tasks on top of the ongoing activity, often unexpectedly" (1986, as cited in Darmoul, Ahmed & Alkahtani, 2015, p. 1240). There are many interruptions that encounter individuals while they have to perform their various activities and tasks, since not all the people they are working with have the same interests and priorities as them.

According to MTD Training (2010), taking the responsibility over the interruptions that an individual may cause is the best way to deal with these interruptions, and comparing the time that s/he wastes to the benefit that could be brought via being

productive during that time. Therefore, if a person admits that s/he has a hand in the interruptions, several actions should be taken in order to eliminate them and make use of the available time effectively (p. 41). Most of people make the interruption as an excuse for not accomplishing tasks in the allocated time, but if the cause of interruption is more important than the task itself, it would not be that harmful to stop and get right back to the task once everything is solved (MTD Training, 2010, p. 41).

In addition, multitasking is another type of interruption that is concerned with people who seem to have high level performance and competitive attitudes, though it is distractive and leads to not fully finishing all the tasks, so it is preferable to finish one task and move to the other (MTD Training, 2010, p. 41). Moreover, procrastination constitutes a major obstacle when it comes to getting done the prior and important activities, also it could be a habit difficult to get rid of. More specifically, if the task is unpleasant, thinking positively would be effective enough (MTD Training, 2010, p. 51). The procrastination could occur when the doer of the task is disorganized, in this case; many time management software applications assist in the process of organization and scheduling things properly (MTD Training, 2010, p. 51).

Many scholars and researchers tried to find general solutions to time management interruptions in order to minimize their negative aftermaths. For instance, a person could align his priorities to match other people's priorities in order to decrease the amount of interruptions as much as possible, however; this is not achievable in the concrete world (Puranik, Koopman & Vough, 2019, p.7). Latorella (1999) suggested four stages to deal with whatever interruption interfere in the completion of any type of tasks, and he summarized them as the following: "interruption detection, interruption interpretation, interruption integration; and terminate with continued ongoing task performance" (as

cited in Darmoul, Ahmed & Alkahtani, 2015, p. 1240). Whereas, Eyrolle and Cellier (2000) have specified four strategies to overcome interruptions:

(1) process the work task completely before beginning to process the interruptive task.

(2) delay processing the interruptive task in order to complete the work task (i.e. asking a caller to wait on hold).

(3) identify the content of the interruptive task and then complete the work task before processing the interruptive task.

(4) process the interruptive task immediately, leaving the work task to be completed later (as cited in Darmoul, Ahmed & Alkahtani, 2015, p. 1240).

2.7. The Importance of Time Management

Time management is one of the most essential elements that have been under research for several years. Researchers studied time management in various spheres of life, varying from business, social life, work, to education. Mackenzie claimed that the effectiveness of time management does not lie in individual's hard work but rather in his/her intelligence (as cited in Richards, 1987, p. 73). Furthermore, it is stated that time management (TM) is highly intertwined with the effectiveness or failure attributed to an individual's organization of tasks (Burt & Kemp, 1994, p. 157). Harriott and Ferrari argued that time management is a vital component in individuals' lives no matter their age, they also reported that since they juggle many roles it is a tiring task to 'set priorities' and 'balance responsibilities' (1996, as cited in Makia & Makia, 2018, p. 78).

Undoubtedly, Kenneth claimed that organizing the time leads people to use it appropriately (2011, p. 6). He provided some factors that show the significance of time management. The first element is undoubtedly time restriction, time with its nature is impossible to be retained. Since time is restricted, people should use it effectively

(Kenneth, 2011, p. 6). The second one is that ‘time is scarce’; which means that time seems always insufficient no matter how many activities you have to do. Thus, time management skills are really needed here to accomplish your tasks (Kenneth, 2011, p. 6). Time is also essential especially in achieving the things that matters most to us; hence, managing time helps us to do that (Kenneth, 2011, p. 6). Furthermore, Kenneth declared that time management strategies allow people to do lots of tasks without necessarily producing too much effort; Moreover, Kenneth claimed that ‘time keeps us on track’; which explains that when time is designated, tasks can be accomplished easily (2011, p. 7).

2.8. The Role of Effective Time Management in Information Processing, Retention, and Recall

The concept of time management has been remarkably put under research due to its importance in different aspects of life, and the rapid growth that the world is witnessing. In this regard, researchers attempt to study the role of various time management skills in relation to other domains in order to highlight its significance. However, it is surprising to notice that no research has been done to find out the role of time management in information processing, retention and recall. de Raadt and Dekeyser stated that “to increase retention, students can be given regular, small-scaled assessable work throughout a course, but this increases the need for greater time-management” (2009, p. 194). It is worthy to mention that only one study was carried out to reveal the connection between time management behavior and memory processes (prospective memory). According to Macan and Gibson (2010) prospective memory refers to: “a collection of behaviors and mental processes concerning a formed intention to remember something

later (most often a task) and remembering that intention at the appropriate time or place" (p. 4). They confirmed that there is a strong relationship between time management behaviors and prospective memory in terms of 'self-reported' time management behaviors and individual's perspectives regarding time structure, purpose, and time use (Macan & Gibson, 2010, p. 12).

Conclusion

In light of what has been presented in this chapter, it is highly important to conclude that time management skills are very significant in changing the people's lives whether concerning the daily activities or in the academic ones. In fact, time management seems an easy task; however, it needs lots of effort and organization. Undoubtedly, time management is very significant for students especially for making the process of processing, retaining and recalling information easy. Hence, time management skills must be reinforced by teachers and highly used by students. Also, intensive knowledge about effective time management skills should be presented to students. In addition, training on how to use these skills appropriately to process, retain and recall information should be taken into consideration.

Chapter Three

Field Investigation

Introduction

The current chapter is devoted exclusively to the practical part, since the previous chapters dealt with information processing, retention and recall, and time management skills respectively. This chapter includes students' questionnaire in the attempt to investigate the effect of time management skills on information processing, retention and recall. Besides, it aims at analyzing and explaining the questionnaire's findings in an objective manner to reach reliable results as much as possible.

3.1. Students' Questionnaire

3.1.1. Aims of Students' Questionnaire

The questionnaire sought to investigate the students' perspectives about the importance of time management skills. Moreover, the ultimate aim was to discover whether students rely on time management skills. Additionally, the questionnaire aimed at investigating the way students process, retain and retrieve information. In this respect, it was administered to discover whether or not students face problems or difficulties to accomplish the previously mentioned processes. Also, it was meant to explore the students' reliance on certain memory strategies for information retention and recall. Finally, the questionnaire looked further to discover students' opinions about the role of effective time management skills in enhancing the mental abilities of processing, retaining and recalling information.

3.1.2. Population of the Study

The current study was directed to second-year Master students at the department of English, 8 Mai 1945 University-Guelma. The main reason behind choosing such level was due to the fact that second-year Master are more knowledgeable and more aware of the educational system; besides being mature enough to express their opinions objectively and without being affected by their emotions. In light of the previously

mentioned reasons, the sample was composed of one hundred and one (101) students out of one hundred and twenty-seven (127) learners based on Krejcie and Morgan's (1970) sampling table (as cited in Cohen, Manion & Morrison, 2007, pp. 102-103). Thus, only 101 questionnaires were delivered online to second-year Master students who are enrolled in four groups.

3.1.3. Description of the Questionnaire

Student's questionnaire was theoretically organized according to the research layout. Mainly, it consists of thirty-three questions divided into four sections. The questions have two different types, the first one is multiple-choice questions, and the second one is dichotomous (yes-no) questions (*see appendix A*).

Section One: General Information (Q1-Q3)

This section contains three questions (Q1-Q3). It aims at collecting data about the students' age, the years spent studying English, and their level in English.

Section Two: Information Processing, Retention and Recall (Q4-Q16)

This section begins with the fourth question (Q4), where the students are asked if they face problems in information processing or not. Then, they are asked to precise what kind of problems they encounter while processing through giving five options, and they are allowed to pick just one option. The fifth and sixth question (Q5-Q6) set to collect data about the students' impression toward the organization and familiarity of information if they have an impact on information processing or not. Then, in the seventh question (Q7) the students are requested to determine what type of information channel they prefer while learning. In the eighth question (Q8) students are asked to answer whether information processing, retention, and recall are conscious or unconscious processes. The ninth question (Q9) deals with the most effective strategies in information retention and recall, where the students are asked to report three strategies the use in this

context. The tenth question (Q10) endeavors to gather statistics about the students' attitudes toward the use information storing strategies for a better recall. In the eleventh question (Q11) students are asked to tell how often they use the strategies of information retention and recall in order to remember particular information. After that, they are asked about their ability to recall certain information whenever necessary (Q12). Then, the students are requested to report their attitudes toward memory training as an effective medium to retain and recall information, and why it acts as an effective medium (Q13). In the fourteenth question (Q14), the students are asked about the extent of importance of encoding and processing information in storing and recalling, as well as the effect of presenting a stimulus on information recall (Q15). The last question in this section (Q16) deals with the factors that may have an influence on information retention and recall (they are allowed to pick three options).

Section Three: The Role of Effective Time Management Skills in Enhancing Information Processing, Retention and Recall (Q17-Q32)

The first three questions (Q17-Q18-Q19) in this section explore the importance of time management for the students, and how often they plan their time and stick to their planning. Then, in the twentieth question (Q20) the students are requested to tell if they compile and prioritize a written to-do list, and complete all the items (when the answer is yes). In the next question (Q21), the students are asked to choose a single time management skill that is effective for time control. Through the question twenty-two, students are expected to answer whether they allocate specific time for learning outside the classroom or not (lessons' review, homework...), and if they incorporate time management skills in doing so, also the reason behind this strategy. After that, students are asked if they are affected by external time-wasters such as: family obligations, phone calls, social media, watching TV, hobbies, games, unexpected visitors, and to what extent

they affect them (Q23). The next question (Q24) is a yes/no question where students are asked whether they take actions to minimize interruptions or intrusions on their time schedules. The questions (Q25-Q26) intends to explore if the students can easily overcome procrastination, and whether they set deadlines for their tasks or not. Then, if their answer is yes, they are asked to clarify if they respect the deadlines. The question (Q27) is related to the use of technology in time management and what type of technological tool the students utilize the most. The last questions (Q28-Q29-Q30-Q31-Q32) are devoted to explore the impact of time management skills on information processing, retention and recall. The students are asked to tell how often they use the time management skills mentioned in the provided table to process, retain and recall information whenever necessary, and if the teachers encourage the use of time management skills for a high academic achievement.

Section Four: Further Suggestions

This section was dedicated to students in order to add any suggestions, comments or recommendations concerning the investigated topic.

3.1.4. Administration of the students' questionnaire

The questionnaire was administered on June 6th, 2020 through an online Face book group of second-year Master students of 8 Mai 1945 university, Guelma. The process of filling the questionnaire took about one month and eleven days of our time from June 6th, till July 18th, 2020. A digital copy was sent to all the students in all the four groups in their emails. The students were promised that their answers will remain confidential and that they will only be used for the sake of research, as they were informed that their answers will be used anonymously. For avoiding any understanding problems and ambiguity, the language used was simple, clear and direct. Accordingly, the students

answered the questions without making a lot of effort. Without forgetting, many students expressed their interest in the topic.

3.1.5. Analysis of Results and Findings from the Students' Questionnaire

Section One: General Information

Question One: Age?

Table 3.1

Students' age

Options	Frequency (N)	Percentage (%)
22	29	29,90%
23	68	70,10%
Total	97	100%

Concerning the students' age, some students (29, 90%) are 22 years. Whereas, more than half of the students (70,10%) are 23 years. Thus, the total number of students is ninety-seven. Accordingly, few students skipped this question.

Question Two: What is your gender?

Table 3.2

Students' Gender

Gender	Frequency (N)	Percentage (%)
Male	17	16,83 %
Female	84	83,16 %
Total	101	100 %

The majority of second-year Master students (83,16 %) are females which means that the sample includes eighty-four (84) girls. Whereas, the boys represent 16,83 % of students which means only 17 boys exist within the sample.

Question Three: How long have you been studying English?

Table 3.3

Students' Years of Studying English

Options	Frequency (N)	Percentage (%)
12 years	75	79,79%
More than 12 years	19	20,21%
Total	94	100%

From the results displayed in the table 3.3, the majority of students (79,79%) stated that they have been studying English for 12 years; which indicates that they performed well in their academic career. Few students (20,21%) admitted that they have been studying English for more than 12 years. This indicates that they whether dropped a year or two, or they failed at some point in their academic career. However, not all students answered this question.

Question Four: How could you describe your level in English?

Table 3.4

Students' Level in English

Options	Frequency (N)	Percentage (%)
Good	68	67,33%
Average	30	29,70%
Bad	3	2,97%
Total	101	100%

The majority of students (67,33%) claimed that they have a good level in English, which indicates that they almost reach the full mastery of the language and they can go further in their academic career, and some students (29,70%) stated that they have an average level in English which implies they have the basic knowledge which can be improved through time. The rest of the students admitted that they are bad in English (2,97%). This is actually a good sign to admit that they are bad in English, so they are aware that they face serious problems with the language which can be solved through hard work.

Section Two: Information Processing, Retention and Recall.

Question Five: a-Do you face problems in processing information?

Table 3.5

Problems Faced in Processing Information

Options	Frequency (N)	Percentage (%)
Yes	49	48,51%
No	52	51,49%
Total	101	100%

As it is noticed from the results in the table 3.5, nearly half of the students (48,51%) face problems in information processing. This implies that they cannot perform well in their academic life since the initial phase of learning is information processing. Whereas, the rest of the students (51,49%) declared that they do not have any problems in information processing, which indicates that their learning process takes place perfectly.

b-If yes, which one of these problems you face the most? (One option)

Table 3.6

Students' Most Common Problems in Information Processing

Options	Frequency (N)	Percentage (%)
Overload of information	11	22,45%
Information processing disorders	6	12,24%
Rate of delivery of information	10	20,41%
The ineffective encoding of information	7	14,29%
Lack of attention	15	30,61%
Total	49	100%

Concerning students' problems in information processing, some students (30,61%) stated that lack of attention hinders their information processing. This insinuates that attention plays a significant role in information processing, and the lack of attention can be internal which means that the student is not interested in the information, s/he has some personal issues that distract his/her attention, or s/he suffers from attention disorders. Also, the lack of attention can be external due to environmental conditions such as: noise, overcrowded class…etc. few students (22,45%) stated that the overload of information constitutes an obstacle to information processing. This indicates that they are receiving a huge amount of information that they cannot process at once, maybe because of teachers' time management in class or their own time management to review learning materials at home. Some students (20,41%) admitted that the rate of delivery of information has a negative impact on their information processing. This denotes that teachers should consider the students' individual differences when delivering information in order to let all the students follow the same pace. A limited number of the students (14,29%) claimed that they do not successfully process information because of the ineffective encoding. This means that they do not make sense of the information in

the first place, so they cannot process it later, and this depends on the characteristics of the information itself and the students' intelligence. The rest of the students (12,24%) declared that they suffer from information processing disorders (sensory, visual, auditory). This implies that they have some health issues to be fixed, and also teachers should pay attention to this problem in order to give all students equal learning opportunities.

Question Six: Do you think that the better information is organized the easier information processing will be?

Table 3.7

The Impact of Information Organization on its Processing

Options	Frequency (N)	Percentage (%)
Yes	99	98%
No	2	2%
Total	101	100%

As it is displayed in the table 3.7, the majority of students (98%) agreed that the better information is organized, the easier information processing is. This implies that nearly all the students are aware of the fact that organization is crucial for a successful information processing, and they are more likely to be organized students. Whereas, a very limited number of the students (2%) believed that organization does not matter when it comes to information processing. This indicates they do not depend on organization in their academic life.

Question Seven: Does the degree of information familiarity play a role in successful information processing?

Table 3.8

The Role of Information Familiarity in Successful Information Processing

Options	Frequency (N)	Percentage (%)
Yes	94	93,07%
No	7	6,93%
Total	101	100%

As it is shown in the table 3.8, the majority of the students (93,07%) agreed that the degree of information familiarity results in successful information processing. This denotes that they have already experienced this situation when the information is familiar, then it is easily processed. However, only seven students (6,93%) believed that familiarity does not have a role in information processing. This indicates that they do not use their background knowledge in order to process information.

Question Eight: Which channel do you prefer when processing certain information?

Table 3.9

Students' Preferable Channels of Information Processing

Options	Frequency (N)	Percentage (%)
Visual	66	65,35%
Acoustic	14	13,86%
Elaborative	12	11,88%
Semantic	9	8,91%
Total	101	100%

This question aims to know the students' preferable channels of processing information, and the results were as follow. The majority of students (65,35%) declared that they prefer visual channels, and some students (13,86%) preferred the acoustic ones.

Whereas, few students (11,88%) opted for elaborative channels, and only nine students (8,91%) prefer the semantic channels. These results imply that each student has his/her own preferable channels of information which depends initially on his/her learning styles.

Question Nine: Is processing, retaining and recalling information conscious or unconscious?

Table 3.10

The Nature of Processing, Retention and Recall

Options	Frequency (N)	Percentage (%)
Conscious	70	69,31%
Unconscious	27	26,73%
Both	4	3,96%
Total	101	100%

As it is displayed in table 3.10, the majority of students (69,31%) agreed that processing, retaining and recalling are conscious in nature, and some students (26,73%) agreed that they are unconscious. However, the rest of the students (3,96%) believed that these processes are both conscious and unconscious. According to these results, we can conclude that students should have more knowledge about their cognitive processes and work on the weaknesses.

Question Ten: What are the most effective strategies in information retention and recall? (Three options)

Table 3.11

The Most Effective Strategies of Information Retention and Recall

Options	Frequency (N)	Percentage (%)
Chunking	28	27.72%
Storytelling	55	54,45%
Acronyms	27	26,73%
Acrostics	8	7,92%
The link method	49	48,51%
Visualization	67	66,33%
The keyword method	37	36,63%
The loci method	8	7,92%

In this question, the students are allowed to choose three options. According to the obtained results, the majority of students (66.33%) declared that visualization is an effective strategy of information retention and recall, and 54.45% of them chose storytelling. Whereas, 48.51% opted for the link method, and 36.63% of them chose the key word method. However, chunking was chosen by 27.72% of the students, and acronyms were chosen by 26.73% of them. Moreover, the loci method is considered as the most effective technique by 7.92%, and the same percentage of students opted for acrostics. Put in a nutshell, the students are aware that there are some techniques which are helpful in information retention and recall, but each student prefers one strategy over the other according to his needs, capacities and preferences.

Question Eleven: Do you agree that relying on some strategies for storing information may result in a better information recall?

Table 3.12

The Impact of Memory Storage Strategies on Information Recall

Options	Frequency (N)	Percentage (%)
Totally disagree	17	16,83%
Neither agree nor disagree	21	20,79%
Totally agree	63	62,38%
Total	101	100%

Concerning the students' views about relying on some strategies for storing information which may result in a better information recall or not, the majority of students (62,38%) said that they totally agree. This indicates that they acknowledge the positive effect of memory strategies on information recall. Whereas, some students (20,79%) are neutral. This means that they are ignorant and they do not have any experience to form an opinion about this concern. Moreover, few students (16,83%) said that they totally disagree. This implies that they whether are not aware of the positive impact, or they have bad experience or inappropriate use of memory strategies.

Question Twelve: How often do you use strategies of information retention and recall in order to remember particular information?

Table 3.13

Frequency of Using Information Retention and Recall Strategies

Options	Frequency (N)	Percentage (%)
Always	22	21,78%
Usually	35	34,65%
Sometimes	40	39,60%
Rarely	3	2,97%
Never	1	1%
Total	101	100%

The previous table displays the frequency of using information retention and recall strategies. The majority of students (39,60%) pointed out that sometimes use retention and recall strategies, while 34,65% of the students admitted that they usually use those strategies. This implies that students make a good use of memory strtegies. Some students (21,78%) said that always depend on retention and recall strategies. This suggests that they acknowledge the effectiveness of retention and recall strategies. while very few students (2,97%) declared that they rarely use them. Unexpectedly, one student opted for never, which means not all the students use retention and recall strategies.

Question Thirteen: Do you feel able to recall information whenever necessary?

Table 3.14

Students' Ability to Recall Information

Options	Frequency (N)	Percentage (%)
Always	13	12,87%
Usually	45	44,55%
Sometimes	41	40,59%
Rarely	2	1,98%
Never	0	0%
Total	101	100%

As it is shown in table 3.14, a significant percentage of students (44,55%) are usually able to retrieve information whenever needed. This implies that they make good of memory strategies. However, 40,59% of the students are sometimes able to recall information, which means that they should work on this weakness and improve their recall. 12,87% of students are always capable to recall information whenever necessary. This indicates that they use memory strategies appropriately, or they have powerful memory that is innate. Surprisingly, very few students (1,98%) are not able to recall information whenever necessary. This denotes that they have serious issues with their memory that should be solved.

Question Fourteen: a-Do you think that memory training is an effective medium for successful information recall?

Table 3.15

The Effectiveness of memory training in information recall

Options	Frequency (N)	Percentage (%)
Yes	95	94,06%
No	6	5,94%
Total	101	100%

According to the findings presented in table 3.15a, the majority of students (94,06%) assumed that memory training is an effective medium for successful information recall. This hints that students are aware of the importance of memory training and its effectiveness. Whereas, few students (5,94%) declared that memory training is not considered as an effective tool to improve information recall. This implies that they are not familiar with the concept of memory training and its aims, or they went through memory training and it was effective for them.

b-if yes, why is memory training an effective medium for successful information recall?

Table 3.16

Reasons for the Effectiveness of Memory Training in Information Recall

Options	Frequency (N)	Percentage (%)
it improves your academic performance	11	11,58%
It enhances your practice focus	9	9,47%
It enhances your brain's ability to process and store positive information	21	22,11%
It improves your neural plasticity	5	5,26%
All the above	49	51,58%
Total	95	100%

Through this question, students are asked to choose the reasons of memory training effectiveness. The majority of students (51,58%) chose "all the above" option, which means that they consider all the mentioned elements in the table as reason for the effectiveness of memory training in information recall. Moreover, some students (22,11%) stated that memory training is effective to improve brain's ability to process and store positive information. This indicates that they perceive memory training from a cognitive point of view. A limited percentage of students (11,58%) claimed that memory training improves academic performance. This indicates that they consider memory training as a helpful tool to perform better generally in exams. Whereas, few students (9,47%) declared that through memory training, practice focus will be enhanced. This denotes that this category of students tends to focus more on specific activities and assignments separately. The rest of students (5,26%) pointed out that memory training is beneficial to enhance neural plasticity. This denotes that they view memory training from a biological perspective.

Question Fifteen: To what extent is encoding and processing information important for storing and recalling it?

Table 3.17

The Importance of Information Encoding and Processing for Retention and Recall

Options	Frequency (N)	Percentage (%)
Not important	4	3,96%
Important	53	52,48%
Very important	44	43,56%
Total	101	100%

Concerning the degree of information processing importance for retention and recall, more than half of the students (52,48%) declared that information processing is important to a moderate degree, and nearly half of them (43,56%) declared that information processing is very important for retention and recall. This implies that they are aware of this their importance and they consider these three processes as complementary to each other. Whereas, very few students (3,96%) believed that information processing is not important for retention and recall. This denotes that they are not aware of their importance and consider processing, retention and recall as separate processes which take place individually without the reliance on each other.

Question Sixteen: Do you think that presenting some stimuli may have an impact on information recall?

Table 3.18

The Impact of Stimuli on Information Recall

Options	Frequency (N)	Percentage (%)
Yes	92	92,93%
No	**7**	7,07%
Total	99	100%

As it is displayed in table 3.18, the majority of students (92,93%) stated that presenting some stimuli may have an impact on information recall. This insinuates that this category of students tends to recall information through a particular stimulus, and they need something to trigger the stored information in order to be retrieved. Whereas, very few students (7,07%) did not believe that stimuli have an effect on information retrieval. Not all students answered this question, some skipped that.

Question Seventeen: Which factors could have a great influence on information retention and recall? (Three options)

Table 3.19

Factors Influencing Information Retention and Recall

Options	Frequency (N)	Percentage (%)
Attention	80	79,21%
Rehearsal	30	29,70%
Sleep	33	32,67%
Reward	17	16,83%
Testing effect	15	14,85%
Mnemonics	9	8,91%
Comprehension	67	66,336%
Motivation	34	33,66%
All of the above	1	0,99%

As it is noticed in table 3.19, a significant percentage (79,21%) was given to attention as a factor that highly influence information retention and recall. This means that a huge number of students acknowledge the importance of attention and they are aware of it. 66,336% of students admitted the influence of comprehension on retention and recall, and 33,66% of them opted for motivation. Whereas, some students (32,67%) opted for the sleeping factor, and 29,70% of students declared that rehearsal has an impact on retention and recall. In addition, some students (16,83%) chose reward, and few of them (14,85%) opted for testing effect. Moreover, a very limited percentage of students (8,91%) declared that mnemonics affects retention and recall, and only one student chooses all the mentioned factors. All these results imply that each student assumes the factors influencing his/her own retention and recall, but they differ in the degree of influence.

Section Three: The Role of Effective Time Management in Enhancing Information Processing, Retention and Recall

Question Eighteen: Do you think that time management is important?

Table 3.20

The Importance of Time Management

Options	Frequency (N)	Percentage (%)
Yes	98	97,03%
No	3	2,97%
Total	101	100%

As it is displayed in table 3.20, the majority of students (97,03%) asserted that time management is important. This indicates that the students are aware of time management importance, and they consider time as crucial in the academic life specifically. Whereas, a limited number of students (2,97%) did not perceive time management as an important aspect. This denotes that they are not aware of time management importance, and they tend to be ignorant and irresponsible students.

Question Nineteen: How often do you plan your time management?

Table 3.21

Students' Frequency of Time Management Planning

Options	Frequency (N)	Percentage (%)
Yearly	3	2,97%
Monthly	25	24,75%
Weekly	30	39,70%
Daily	31	30,70%
Never	12	11,88%
Total	101	100%

Concerning students' frequency of time management planning, a significant percentage of students (39,70%) declared that they determine what to do with their time every week. This denotes that they have schedules for the whole week, and they probably use the weekends to see whether they accomplished the tasks of the previous week or not and plan for the next week. 30,70% of students admitted that they plan for their time on daily basis. This implies that they are really good time managers, and they are aware of the importance of time management. This category of students usually tends to use "to-do lists" to organize time and at the end of the day they tick what they achieved, and make brand new "to-do list" for the next day. Furthermore, this type of students cares about time and they take control of it to optimize their productivity. Hence, they ensure that they know what to do and when. Whereas, some students (24,75%) opted for monthly time planning. This implies that they have somehow good time management. Moreover, few students (11,88%) said that they never have time planning, which is bad for their academic career, and this denotes that they do not consider time management as important. Also, they tend to procrastinate and let activities sit till the last minute, so they feel stressed and overwhelmed, and they lack punctuality. However, a very limited

percentage of students (2,97%) stated that they plan for their time yearly. This indicates that they probably have big long-term goals they plan for them yearly, and they tend to ignore the actional tasks.

Question Twenty: How often do you stick to your time planning?

Table 3.22

Students' Frequency of Time Planning Commitment

Options	Frequency (N)	Percentage (%)
Always	10	9.9%
Usually	29	28,71%
Sometimes	38	37,62%
Rarely	16	15,84%
Never	7	6,93%
Total	101	100%

As shown in table 3.22, a significant percentage of students (37.62%) stated that they are not all the time committed to their time planning. This indicates that they have to work on their time management in order to avoid time anxiety and stress. Whereas, 28.71% of students declared that they are usually committed to their schedules. This denotes that they have awareness about time management and in most of the time they achieve their aims. Some students (15.84%) opted for rarely which is not good to their time management. Only 9.9% of students always stick to their time planning and accomplish all the tasks. This implies that they are responsible and they are able to accomplish what they need in the exact time. Unexpectedly, very few students (6.93%) opted for never. This insinuates that they fail to set goals, and they have poor punctuality and they tend to procrastinate.

Question 21: a-Do you compile and prioritize a written daily "To-Do" list?

Table 3.23

Students' Compilation and Prioritization of a Written Daily "To-Do" List

Options	Frequency (N)	Percentage (%)
Yes	54	53,47%
No	47	46,53%
Total	101	100%

As it is displayed in table 3.23, more than half of the respondents (53, 47%) declared that they compile and prioritize a written daily "to-do" list. This denotes that they are aware of their time control which creates order and a technique for getting things done. Moreover, they prioritize tasks that need to be done according to their importance and deadlines. Also, "to-do" lists give the students the feeling of being productive. However, nearly half of the students (46,53%) admitted that they do not use "to-do" lists to manage their time. This indicates that they deny the benefits of "to-do" list as a strategy to take control over time and being able to get tasks accomplished in the set deadlines.

b-If yes, do you complete all items on your daily "To-Do" lists?

Table 3.24

Students' Completion of their "To-Do" Lists

Options	Frequency (N)	Percentage (%)
Not all	16	29,63%
Nearly all	30	55,56%
All	8	14,81%
Total	54	100%

Concerning students' completion of their "to-do" lists, it is shown in table 3.24 that half of students (55,56%) stated that they nearly complete all the "to-do" list items.

Whereas, some students (29,63%) declared that they are not able to accomplish all the tasks. This denotes that they have some sort of commitment to their "to-do" lists, but they still lack good time management and how to deal with time wasters. A limited percentage of students (14,81%) admitted they accomplish all the tasks written in their "to-do" lists. This indicates that they have control over time, and they know how to cope with any unexpected conditions.

Question twenty-two: Which of the following time management skills is the most effective in time control?

Table 3.25

The Most Effective Time Management Skills

Options	Frequency (N)	Percentage (%)
Good organization	34	33,66%
Prioritization	18	17,82%
Efficient scheduling	12	11,88%
Using planning tools	6	5,94%
Planning in relation to goal setting	14	13,86%
Managing external time wasters	6	5,94%
Avoiding multi-tasking	11	10,89%

According to the results displayed in table 3.25, 33,66% of students opted for good organization as an effective time management skill. This conveys that students prefer reordering and rearranging tasks for better results. Some students (17,82%) chose prioritization which is in fact is a good strategy to organize activities based on priority and importance, and 13,86% of them asserted that planning time in relation to goal setting is a beneficial method to manage time. This denotes that they know how to identify their goals, and focus on how to achieve the desired outcome that may affect their future.

Whereas, few students (11,88%) declared that efficient scheduling is more effective. This indicates that students believe that perfectly designed schedules act as a guide to manage time effectively. In addition, 10,89% of students opted for avoiding multitasking. This indicates that they tend to focus on one task, then moving to the other without confusion because this will be time consuming and none of tasks will be done in the allocated time. Moreover, very few students (5,94%) opted for using planning tools. This implies that students focus more on productivity to track their progress through the day/ week/ month. Also, the same percentage of students (5,94%) claimed that managing external time wasters will be more efficient. This suggests that they are totally aware of the negative impact of time wasters on time management, so they manage them to avoid time traps.

Question Twenty-three: a-Do you allocate a specific time for learning outside the classroom (e.g. Revision, homework…)?

Table 3.26

Students' Allocation of Time for Learning outside the Classroom

Options	Frequency (N)	Percentage (%)
Yes	83	82,18%
No	18	17,82%
Total	101	100%

As displayed in table 3.26, a high percentage of students (82,18%) declared that they allocate specific time for learning outside the classroom. This might imply that they belong to" hard working students" category, and they dedicate extra time at home for revision and preparing. A low percentage of students (17,82%) said that learning inside the classroom is enough, and they do not need extra time for learning outside it. This might indicate they grasp all the information inside the classroom and this is sufficient for them, or they belong to "lazy students" category.

b-If yes, do you incorporate time management skills in reviewing your lessons?

Table 3.27

Students' Incorporation of Time Management Skills in Lessons' Review

Options	Frequency (N)	Percentage (%)
Yes	71	85,54%
No	12	14,46%
Total	83	100%

As a continuation to the previous question, the majority of students (85,54%) stated that they use time management skills in order to review their lesson at home. This highly indicates that they take responsibility over their learning which enables them to address their current tasks, and they are aware of the positive effects of time management skills. Whereas, few students (14,46%) declared that they do not incorporate time management skills in the process of reviewing the lessons. This denotes they do such process in a random way and they do not consider the time factor in order to make it efficient.

c- Why do you mainly do so?

Table 3.28

Reasons for Using Time Management Skills

Options	Frequency (N)	Percentage (%)
For better information processing	10	14,08%
For better information retention and recall	13	18,31%
Both	48	67,61%
Total	71	100%

Concerning the reasons for using time management skills, the majority of students (67,61%) opted for both choices which indicates that time management skills are effective for information processing and information retention and recall. Some students (18,31%) asserted that time management skills help to improve information retention and

recall. This implies their memory systems cannot function effectively if they do not use one of time management skills. Whereas, 14,08% of students claimed that they use them to make their information better. This suggests that they need the information to be organized, clear and purposeful in order to process it effectively.

Question twenty-Four: a-Are you affected by the following external time-wasters?

Table 3.29

External Time-Wasters

Options	Frequency (N)	Percentage (%)
Family obligations	54	53,47%
Phone calls	27	26,73%
Social media	73	72,28%
Watching TV	20	19,80%
Hobbies	25	24,75%
Games	21	20,79%
Unexpected guests	46	45,54%

As it is shown in table 3.29, a high percentage of students (72,28%) declared that social media influence their time. A significant percentage of students (53,47%) declared that their time is affected negatively by family obligations, while 45,54% of students chose unexpected guests. 26,73% of students opted for phone calls, and 24.75% of them opted for hobbies. Whereas, some students (20,79%) asserted they waste time because of games. A low percentage of students (19.80%) opted for watching TV. According to the obtained results, family obligations phone calls and unexpected are the most common time wasters among students.

b- To what extent are you affected by the above-mentioned time-wasters?

Table 3.30

The Extent of External Time-Wasters' Influence

Options	Frequency (N)	Percentage (%)
To a great extent	31	31,96%
To a moderate extent	55	56,70%
To a limited extent	11	11,34%
Total	97	100%

As it is shown in table 3.30, more than half of students (56,70%) declared that time wasters affect them to a moderate extent. This indicates that they should work on their time management skills and try to improve them. 31,96% of students stated that they are influenced by external time wasters to a great extent. This suggests that they do not manage their effectively which may impact their productivity in a negative manner. A low percentage of students (11,34%) asserted that they are not extremely affected by time wasters which something good and hints that they have good time management. Not all students answered this question, some of them skipped it.

Question Twenty-Five: Do you take action to minimize interruptions or intrusions on your time schedules?

Table 3.31

The Minimization of Interruptions and Intrusions on Time Schedules

Options	Frequency (N)	Percentage (%)
Yes	76	75,25%
No	24	23,76%
Total	101	100%

Concerning the minimization interruptions and intrusions on time schedules, a significant percentage of students (75.25%) asserted that they take actions in order to minimize time interruptions. This insinuates that they are committed to their time schedules and emphasize the importance of time. Whereas, 23.76% of students declared that they do not take actions to deal with interruptions, which in turn suggests that they do not value time and they do not care about their time schedules.

Question Twenty-six: do you easily overcome procrastination?

Table 3.32

Students' Ability to Overcome Procrastination

Options	Frequency (N)	Percentage (%)
Yes	39	38,61%
No	61	60,39%
Total	101	100%

In this question, the students are asked about their ability to overcome procrastination. The majority of students (60,39%) asserted they have a difficulty to overcome procrastination, which a clear sign that they are not aware of the importance of time, and they tend to delay tasks till the last minute. Whereas, 38,61% of students

admitted they easily overcome procrastination. It denotes that they are punctual learners, and they tend to meet all the set deadlines.

Question twenty-seven: a-Do you set deadlines for your tasks?

Table 3.33

Setting Deadlines for Students' Tasks

Options	Frequency(N)	Percentage (%)
Yes	84	83,17%
No	17	16,83%
Total	101	100%

According to the results displayed in table 3.33, the majority of students (83,17%) claimed that they set deadlines for tasks. It indicates that they have the tendency to ensure that the tasks will be done in time, and this created a confusion free environment. Only some students (16,83%) declared that they do not set deadlines. This implies that they do not track their time in terms of goals to be achieved.

b-If yes, do you usually meet your tasks' deadlines?

Table 3.34

Students' Respect of Tasks' Deadlines

Options	Frequency (N)	Percentage (%)
Yes	65	77,38%
No	19	22,62%
Total	84	100%

As it is shown in table 3.34, a high percentage of students (77,38%) stated that they usually meet their tasks' deadlines, which suggests that they are not only good time planners, but they also achieve their aims. Whereas, few students (22,62%) asserted that

they do not usually meet the set deadlines. This denotes that despite the fact they set deadlines, they fail to meet them because of time wasters or poor planning.

Question Twenty-eight: How do you feel when you have many tasks to do in a short period of time?

Table 3.35

Students' Feelings about Having Many Tasks in a Short Time

Options	Frequency (N)	Percentage (%)
Very stressed	50	49,50%
Stressed	37	36,63%
Not stressed at all	14	13,86%
Total	101	100%

As it is displayed in table 3.35, nearly half of the students (49,50%) feel very stressed when they have many tasks to do in a short period of time. It indicates that they suffer from time stress or time anxiety that may have a negative effect on their planning and their performance as well. 36,63% of students declared that they feel stressed but not a great extent. This insinuates that they worry about having many tasks to do but they may manage it in a way or another. Whereas, the rest of students (13,86%) claimed that do not feel stressed at all. This denotes that they are either expert time managers or careless students who do not have feelings.

Question Twenty-nine:

a-Do you use technology for organizing your time?

Table 3.36

Students' Use of Technology for Time Organization

Options	Frequency (N)	Percentage (%)
Yes	70	69,31%
No	31	30,69%
Total	101	100%

Concerning students' use of technology for time management, the majority of students (69,31%) asserted that they use technological tools to take control over time. This implies that they recognize the importance and advantage of using technology for time management. Whereas, 30,69% of students stated that they do not utilize technology to manage time. This may indicate that they are not familiar with various time management applications.

b-If yes, which one of these technological tools you use the most?

Table 3.37

Students' Most Used Technological Tools

Options	**Frequency (N)**	**Percentage (%)**
Computers	6	8,33%
Smart phones	50	72,22%
Laptops	13	18,06%
Tablets	1	1,39%
Total	70	100%

As it is displayed in table 3.37, the majority of students (72,22%) chose smart phones as the technological device they use the most for time control. 18,06% of students preferred using laptops, and a very limited percentage of students (8,33%) opted for

computers. Whereas, only one student opted for tablets. From these findings, it is obvious that smart phones are the most used device for time management since it is practical, available and accessible to the vast majority of students.

Question Thirty: How often do you rely on the following time management skills to process, retain and recall information whenever needed?

Table 3.38

Frequency of Using "Good Organization" as a Time Management Skill

Options	Frequency (N)	Percentage (%)
Always	30	32.96%
Usually	24	26.37%
Sometimes	30	32.96%
Rarely	6	6.59%
Never	1	1.09%

Concerning the frequency of using time management skills, 32.96% of students declared that they always use good organization for time control, and the same percentage of students said that they sometimes use it. Some students (26.37%) stated that they usually use good organization to manage their time. Whereas, very few students (6.59%) admitted that they rarely opt for good organization, and only one student said that s/he never use it. As it is displayed, we conclude that the majority of students make good use of organization.

Table 3.39

Frequency of using "Prioritization" as a time management skill

Options	Frequency (N)	Percentage (%)
Always	40	43.95%
Usually	30	32.96%
Sometimes	16	17.78%
Rarely	3	3.29%
Never	2	2.19%

As it is shown in table 3.39, a high percentage of students (43.95%) stated that they always use prioritization to manage their time. 32.96% of students said that they usually use prioritization, while some students (17.78%) declared that they use it sometimes only. Moreover, very few students (3.29%) opted for rarely, and the rest of them (2.19%) opted for never. All these results indicate that students have noticeable awareness of the importance of prioritization as a time management skill.

Table 3.40

Frequency of Using "Efficient Scheduling" as a Time Management Skill

Option	Frequency (N)	Percentage (%)
Always	19	19.38%
Usually	30	30.61%
Sometimes	33	36.67%
Rarely	15	15.30%
Never	1	1.02%

As it is displayed in table 3.40, 36.67% of the students declared that they sometimes make use of efficient scheduling for time management, while 30.61% students opted for

usually. However, some students (19.38%) claimed that they always utilize schedules, and few students 15.30% opted for rarely. Moreover, only one student admitted that s/he never used efficient scheduling. These findings show that most of students use efficient scheduling to manage their time but to varying degrees.

Table 3.41

Frequency of Using "Planning Tools" as a Time Management Skill

Option	Frequency (N)	Percentage (%)
Always	20	20.40%
Usually	25	25.51%
Sometimes	20	20.40%
Rarely	24	24.48%
Never	9	9.18%

The previous table displays the frequency of using planning tools such as calendars, digital apps…etc. 25.51% of students said that they usually use them. Whereas, 24.48% of students opted for rarely. Some students (20.40%) stated they always depend on various planning tools to manage their time, and the same percentage of students declared they are sometimes dependent to planning tools. However, a very limited percentage of students (9.18%) opted for never.

Table 3.42

Frequency of Using "Planning According to Goal Setting" as a Time Management Skill

Options	Frequency (N)	Percentage (%)
Always	35	34.65%
Usually	30	29.70%
Sometimes	24	23.76%
Rarely	8	7.92%
Never	4	3.96%

As it is shown in table 3.42, a high percentage of students (34.65%) admitted that they always plan their time according to the already set goals. Some students (29.70%) stated that they usually manage their time in relation to goal setting, while few students (23.76%) said that they sometimes do so. Moreover, 7.92% of students opted for rarely, and the rest of them opted for never.

Table 3.43

Frequency of Using "Managing External Time-Wasters" as a Time Management Skill

Option	Frequency (N)	Percentage (%)
Always	13	13.26%
Usually	25	25.51%
Sometimes	38	38.77%
Rarely	17	17.34%
Never	5	5.1%

According to table 3.43, 38.77% of students stated that they only sometimes capable of managing external time wasters. Some students (25.51%) said they are

usually capable to deal with different external time wasters, while few students (17.34%) opted for rarely. 13.26% of students declared that they are always able to manage external time wasters in order make good use of their time, and very few students (5.1%) opted for never.

Table 3.44

Frequency of Using "Avoiding Multitasking" as a Time Management Skill

Option	Frequency (N)	Percentage (%)
Always	23	23%
Usually	26	26%
Sometimes	29	29%
Rarely	17	17%
Never	5	5%

As it is displayed in table 3.44, 29% of students declared that they sometimes avoid multitasking. Some students (26%) said that they usually avoid switching between the tasks, while 23% students stated that they always avoid it, and they focus on performing one task, then once it is finished, they move to the next one. Moreover, few students (17%) opted for rarely, and the rest of them opted for never.

Question Thirty-one: Do you usually evaluate time management skills to see how they worked for you in relation to information processing, retention, and recall?

Table 3.45

Self-*Evaluation of Time Management Skills*

Options	Frequency (N)	Percentage (%)
Yes	58	58,59%
No	41	41,41%
Total	99	100%

As it is shown in table 3.45, more than half of the students (58,59%) declared that they usually evaluate time management skills in relation to information processing, retention and recall. It denotes that realize the impact of good time management on their different cognitive processes. Whereas, less than half of the students (41,41%) stated that they do not go through the process of evaluation to see how time management influence information processing, retention and recall. This implies that they do not notice the importance of time in such processes.

Question Thirty-two: Do your teachers encourage you to use time management skills while processing the learned information?

Table 3.46

Teachers' Encouragement of Students to Use of Time Management Skills

Options	Frequency (N)	Percentage (%)
Yes	68	67,33%
No	33	32,67%
Total	101	100%

According to the results shown in table 3.46, the majority of students (67,33%) declared that their teachers encourage them to use time management skills. This suggests that teachers are aware of the importance of time management skills and their advantages

that bring benefits to the students at all levels. Whereas, the rest of students (32,67%) stated that their teachers do not encourage them to use time management skills. This explains why some students are not aware of the significance of time management and its positive impact on them.

Question Thirty-three: Could effective time management lead to high academic achievement?

Table 3.47

The Impact of Effective Time Management on Academic Achievement

Options	Frequency (N)	Percentage (%)
Yes	88	88,88%
No	11	11,11%
Total	101	100%

As displayed in table 3.47, a very high percentage of students (88,88%) admitted that effective time management lead to high academic achievement. This implies that taking control over time and raising awareness of tasks and requirements at hand enable students to reach high academic performance. However, few students (11,11%) said that there is no relationship between effective time management skills and high academic performance. This may indicate that they are not users of time management skills at all, or they have bad perceptions about time management.

Section Four: Further Suggestions

Out of 101 students, only some students (31, 68%) added their suggestions and commented on the topic of our research. The participants' comments and suggestions can be summarized in the following few points:

-Despite the fact that time management have been dealt with in different areas of research and in relation to different aspects of study, this research spots the light on a totally new area concerning time management.

-Time management can also be tackled in relation to the students' profiles and motivation; in the sense that the more the student is motivated enough about the task in hand, time management and better recalling strategies will be part of the process of learning.

-As a matter of fact, time management is an unquestionable factor in achieving academic success; yet, even when students fail to commit to time management skills to attain a certain task, the other mental abilities will contribute to the fulfillment of that certain task.

-It is a very interesting topic and enjoyable questions to answer. But few questions with justifications would be good.

- The role of the teacher is very significant at this point, especially in emphasizing the importance of time management skills.

-The teachers' role is also an important assistor in the process of recalling the information, via introducing key points to the students while learning to help them reestablish what they have learned. This will automatically help them in retrieving the information in exams

3.1.6. Summary of Results and Findings from the Students' Questionnaire

In view of the previously mentioned results from the students' questionnaire, the questionnaire covered the students' general information, in addition to background knowledge about information processing, retention and recall. It showed that almost student had problems of processing information; mainly the lack of attention. For the most effective strategies of information for information retention and recall, students

showed interest in all of them. For the frequency of information retention and recall strategies use, students varied in the use of these strategies, which implies that the use of these strategies depends on the personality of the student and his/her way of learning. Additionally, the majority of students agreed on the effectiveness of memory training in successful information recall, almost half of them linked this to many reasons like improving academic performance, enhancing practice focus, enhancing the brain's ability to process and store positive information and finally improving neural plasticity. Concerning the degree of importance of information processing, half of the students declared that it is important for retrieving information later; which implies the degree of importance students attribute to information processing, retention and recall is high and these three processes are complementary to each other. Concerning the most influencing factors of information retention and recall, responses ranged from attention, comprehension and motivation.

Furthermore, the majority of students were aware of the importance of time management. Concerning the frequency of time management planning, students differed in planning their time from daily, weekly, monthly, yearly and finally never following this order, which indicates that some students prefer to plan on a long-term basis while others on a short-term basis. For the most effective time management skills, good organization tends to be the highest in rank. Despite the fact that students were interested in all of the skills, they showed little interest in using planning tools and managing external time wasters. This implies that each student uses a certain skill that he finds him/herself comfortable with. Students declared that they incorporate time management skills for learning outside class mainly for better information Processing retention and recall. This indicates the students' willingness to learn via organizing their time.

Finally, concerning external time wasters; unsurprisingly, results show that students more or less were affected by social media at a higher degree. Hence, this implies that adequate implementation of time management should be controlled and guided because of the negative influence of social media. The current study tended to explore the role of effective time management skills in improving information processing, retention and recall. Results showed the interconnectedness existing between time management skills and information processing, retention and recall. Consequently, we can claim that the hypothesis of the research is confirmed and that using time management skills effectively improve information processing, retention and recall.

Conclusion

Based on the results collected from the field investigation, one can claim that there is a relationship between time management skills and information processing, retention and recall. Hence, time management skills are good for both information processing and information retention and recall. Based on the students' opinions, time should be organized and allocated following certain effective skills: good organization, prioritization, efficient scheduling, using planning tools, planning in relation to goal setting, managing external time wasters and avoiding multi-tasking. Consequently, effective time management skills need to be implemented very well during the learning process. This implementation should be guided and controlled especially when processing the information, then when retaining that information and later on when recalling it back.

Additionally, the role of the teacher is very important in encouraging students to use time management skills. As well as, teachers should remind their students of the benefits of using such skills to save and allocate time appropriately. Finally, pedagogical

procedures should be done in order to help train learners on how to use memory strategies.

General Conclusion

The present study was carried out in order to investigate the role of effective time management skills in enhancing information processing, retention and recall. Precisely, the hypothesis states that if students use time management skills effectively, their information processing, retention and recall would improve. The acquired results confirmed that the use of effective time management skills improves information processing, retention and recall. Hence, the students' questionnaire confirms the main hypothesis which reveals the effectiveness and interconnectedness between effective time management skills and the three mental abilities of memory which are processing, retention and recall of information.

Based on the aforementioned reviewed literature about the two variables as well as the results, we would like to address some pedagogical implications to both staff responsible for decision making concerning higher education, teachers and students. The personnel of higher education need to: add a module of effective time management skills, or decide on workshops for using time management skills effectively. In addition, they can invest training in relation to time management skills. The teachers should diversify the methods and strategies used specially to control time. Also, teachers should limit the amount of knowledge presented in each lesson. In addition, the students should improve their time management through training and workshops which can be done in some specialized centers in human resources. Concerning the limitations, we encountered are stated as following: we were not able to use another data gathering tool, chiefly the interview for teachers because of the pandemic. Thus, we were not able to access the teachers' perspectives about the topic. Also, time loss was a great limitation for fulfilling our work because of the students' hesitation and irresponsibility in filling the questionnaire.

Consequently, almost forty-five days were lost waiting for receiving answers of the students. Hence, future researches on the topic may cover the topic from an experimental dimension to discover other issues which have not been covered in this research. Finally, future research questions may be as following: does processing information take a longer period than retention and recall? Does the students' creativity play a role in allocating time fairly among the three mental processes of processing, retaining and recalling information? Does gender affect information processing, retention, recall and time management skills?

References

Abe, M., Schambra, H., Wassermann, E. M., Luckenbaugh, D., Schweighofer, N., & Cohen, L. G. (2011). Reward improves long-term retention of a motor memory through induction of offline memory gains. *Current Biology, 21* (7), 557– 562. Doi: 10.1016/j.cub.2011.02.030

Alheneidi, H. H. (2019). The influence of information overload and problematic internet on adult's well-being. *Centre for Occupational and Health Psychology*.

Aliyu, U. (2011). Time management as a vital tool in the attainment of optimum efficiency. *Academia.edu.*

Allyn & Bacon (1998). Memory techniques: techniques for remembering information. Retrieved from http://www.ucdenver.edu/life/services/LRCOLD/Documents/Self-paced trainings/memory Techniques- student version.pdf

Amin, H. U., & Malik, A. (2014). Human memory retention and recall processes: a review of EEG and FMRI studies. *Neurosciences, 18 (4),* 330-344.

Atkinson, R. C., & Raugh, M. R. (1975). An application of the mnemonic keyword method to the acquisition of a Russian vocabulary. *Journal of Experimental Psychology: Human Learning and Memory, 1*(2), 126–133. Doi: 10.1037/0278-7393.1.2.126

Atkinson, R. C., & Shiffrin, R. M. (1968). Human memory: a proposed system and its control processes. Psychology of Learning and Motivation, 89-195. DOI: 10. 1016/s0079

Bablekou, Z. (2009). Nous: cognitive models of working memory. *Researchgate*. DOI: 10. 4018/978-1-60566-392.ch006

Bahadori, M., Salesi, M., Ravangard, R., Hosseini, S. M., Raadabadi, M., Dana, A. H., & Ameryoun, A. (2015). Prioritization of factors affecting time management among health managers. *International Journal of Travel Medicine and Global Health. 3* (4), 159-164. DOI: 10.20286/IJTMGH-0304142

Banikowski, A. K., & Mehring, T. A. (1999). Strategies to enhance memory based on brain research. *Focus on Exceptional Children, 32* (2). Doi: 10.17161/fec. v32i2.6772

Basha, S. A., & Adhikary, C. (2017). Chunking cum acrostics strategy as a toll for memorizing the names of countries and continents. *Scholarly Research Journal for Humanity Science and English Language, 4* (21), 5125-5136.

Biyikli, C. & Doğan, N. (2015). The effect of learning strategies used for rehearsal on the academic success. *Education and Science, 40* (181), 311-327. Doi: 10.15390/EB.2015.2728

Bond, M. J., & Feather, N. t. (1988). Some Correlates of Structure and Purpose in the Use of Time. *Journal of Personality and Social Psychology, 55* (2), 321-32.

Britton, B. K., & Tesser, A. (1991). Effects of time-management practices on college grades. *Journal of Educational Psychology, 83* (3), 405-410. DOI: 0.1037/0022-663.83.3.405

Broadbent, D. E. (1996). Information processing in the nervous system. *Researchgate*.

Burt, C. D. B., & Kemp, S. (1994). Construction of activity duration and time management potential. *Applied Cognitive Psychology*, *8*, 155-168.

Burton, L. D. (2016) Can a Tomato Increase Your Productivity? *Journal of Research on Christian Education, 25* (2), 95-96, DOI: 10.1080/10656219.2016.1191926

Buzan, T. (1971). *Use your head: Speed memory*. Great Britain: Sphere Books.

Cheng, M, & Boggett-Carsjens, J. (2005). Consider sensory processing disorders in the explosive child: care report and reviews. *The Canadian Child and Adolescent Psychiatry Review*, 14 (2), 44-48.

Claessens, B. J. C., Van Eerde, W. (2007). A review of time literature. *RsearchGate*, 36(2), 255-276. DOI 10.1108/00483480710726136

Cohen, L., Manion, L., & Morrisson, K. (2007). *Research methods in education* (6th edition). New York: Routledge.

Conrey, F. R. et *al*. (2005). Seperating multiple processes in implicit social cognition: The Quad model of implicit task performance. *Journal of Personality and Social Psychology, 89 (4),* 469-487. DOI: 10. 1037/0022-3514.89.4.469

Corlett, D, et al. (2004). A mobile learning organizer for university students. *Evaluation of Mobile Learning Organizer for University Students*

Covey, S.R., Merrill, R. & Merrill, R.R. (1994). First Things First: to Live, to Love, to Learn, to Leave a Legacy. USA: Simon & Schuster Publishing.

Darmoul, S., Ahmed, A. & Alkahtani, M. (2015). Interruption management in human multitasking environments. *Preprints of the 15th IFAC Symposium on Information Control Problems in Manufacturing.*

Davis, L., Sirotowitz, S., & Parker, C. H. (1997). *Study strategies made easy*. USA: Library of Congress Cataloging-in-Publication Data.

de Raadt, M., Dekeyser, S. (2009). A simple time-management tool for students' online learning activities. *Proceedings Ascilite Auckland*

Deutsch, R., & Strack, F. (2004). Reflective and impulsive determinant of social behavior. *Personality and Social Psychology Review, 8 (3),* 220-247.

Diane, C. (2012). Theories on workload and time management. Houston Chronicle. USA:Hearst Communications, Inc.

Eilam, B., & Aharon, I. (2003). Students planning in the process of self-regulated learning. *Contemporary Educational Psychology*, 304-334. Doi: 10.1016/S0361- 476X (02)00042-5

Eilam, B., & Aharon, I. Macleod, L. (2012). Making smart goals smarter. *Physician Executive, 38* (2), 68-72. Retrieved from https://www.researchgate.net/publication/256098067

Folasade, A. E. (2014). Time Management in Organization. Retrieved from www.academia.edu

Frank, M. G., & Benington, J. H. (2006). The role of sleep in memory consolidation and brain plasticity: Dream or reality? *The Neuroscientist, 12* (6), 477-488. Doi: 10.1177/1073858406293552

Gardner, H. (1995). *The Mind's New Science: A History of the Cognitive Revolution*. NewYork: basic books.

Gasper, J. M., & Untoda, N. A. (2017). Common memorization techniques of grade 10 male students of Bataraza national high school and its implications to teaching: survey, analysis and suggestions of memorization techniques. *Researchgate.*

Grissom, J., Loeb, S., Mitanni, H. (2015). Principal rime management skills: Explaining patterns in principal's time use, job stress, and perceived effectiveness. *Journal of Educational Administration, 53 (6), pp. 773-793. DOI:10.1108/JEA-09-2014-011*

Grosfed-Nir, A., Ronen, B. & Kozlovsky, N. (2007). The Pareto managerial principle; When does it apply? *International Journal of Production Research, 45* (10), 2317 – 2325.

Gruszk, A, & Orzechowski, J. (2016). Meta-analysis of the research impact of Baddeley's multicomponent working memory model and Cowan's embedded-processes model of working memory: a bibliometric mapping approach. *Polish Psychological Bulletin, 47 (1),* 1-11. DOI: 10. 1515/ppb-2016-00011

Hoque, Md. E. (2019). Memorization: A proven method of learning. *International Journal of Applied Research, 22,* 142-150.

Jinalee, N., & Singh, A. K. (2018). A descriptive study of time management models and theories. *International Journal of Advanced Scientific Research and Management, 3* (9), 141-147.

Kellog, R. T. (2007). *Fundamentals of Cognitive Psychology*. San Jose State University.

Kenneth, A. (2012). Understanding the importance of time management to assistant registrar's in the registrar's department of the University of Education. *International Journal of Scientific & Engineering Research, 3* (12), 1-16.

Lah, N. C., Saat, R. M., & Hassan, R. (2014). Cognitive strategy in learning Chemistry: how chunking and learning get together. *The Malaysian Online Journal of Educational Science, 2* (1), 9-15. https://files.eric.ed.gov/fulltext/EJ1086202.pdf

Lakein, A. (1989). How to get control of your time and your life. Signet. Available from https://www.amazon.com/Control-Your-Time-Life Signet/dp/0451167724

Macan, T. H. (1996). Time-Management Training: Effects on Time Behaviors, Attitudes, and Job Performance. *The Journal of Psychology*, 130 (3), 229-236. DOI:10.1080/00223980.1996.9915004.

Macan, T., Gibson, J.M. (2010). Will you remember to read this article later when you have time? The relationship between prospective memory and time management. *Personality and Individual Differences*. DOI: 10.1016/j.paid.2010.01.015

Makia, E., & Makia, J. (2018). *Time management survival planning guide for schools and colleges.* Kendall Hunt Publishing Company.

Massaro, D. W., & Cowan, N. (1993). Information processing models: microscopes of the mind. Annual Review of Psychology, 383-425. DOI: 10. 1146/annurev.ps.44.020193.002123

Mayer, R. E. (1996). Learners as information processors: legacies and limitations of educational psychology's second metaphor. *Educational Psychologist, 31 (4),* 151-161.

McGregor, I., & Holmes, J. G. (1999). How storytelling shapes memory and impressions of relationship events over time. *Journal of Personality and Social Psychology, 76* (3), 403-419. DOI: 10.1037/0022-3514.76.3.403

Melby-Lervag, M., & Hulme, C. (2012). Is working memory training effective? A meta-analytic review. *Developmental Psychology*. DOI: 10. 1037/a0027473

Miller, A. M. (2018). Goal setting and its influence on achievement in the Spanish language classroom: combining second language acquisition, achievement goal theory, and goal setting theory [Doctoral Dissertation, Alabama University]. Retrieved from https://ir.ua.edu/bitstream/handle/123456789/3664/file_1.pdf?sequence=1&isAllowed =y

Moeller, A. K., Theiler, J. M., & Wu, C. (2012). Goal setting and student achievement: A longitudinal study. *The Modern Language Journal, 96* (2), 153-169. Doi: 0.1111/j.1540-4781.2011. 01231.x

MTD Training (2010). Motivation skills. MTD Training & Ventus Publishing ApS. *Managing Time* (2011). Rai Technology University.

Nadinolyi, K. B., Hajloo, N., Garamaleki, N. S., & Sadeghi, H. (2013). The study efficacy of time management training on increase academic time management of students. *Procedia - Social and Behavioral Sciences, 84,* 134-138.

Ni, L. B. & Hassan, N. A. B. (2019). The use of mnemonic and mathematical mnemonic method in improving historical understanding. *International Journal of Educational and Pedagogical Sciences, 13* (2), 93-97.

Nwabueze, A. I., Edikpa, E., & Chukwama, I. S. (2018). Timing the work for enhanced administrative performance in universities. *International Journal of Development Research*, 8 (7), 21982-21991.

Orehek, E., & Kruglanski, A. W. (2006). Partitioning the domain of social inference: dual mode and systems models and their alternatives. *Researchgate*.

Pampori, Z, A., & Malla, W. A. (2010). Mechanisms of memory – a review. *International Journal for Innovative Research in Multidisciplinary Field, 2 (9),* 336-344.

Persuh, M., Genzer, B., & Melara, R. D. (2012). Iconic memory requires attention. *Frontiers in Human Neuroscience, 6 (126),* 1-8. DOI: 10. 3389/fnhum.2012.00126

Pezzulo, G. (2007). Working memory. *Researchgate*.

Potkin, K. T., & Bunney, W. E. (2012). Sleep improves memory: The effect of sleep on long term memory in early adolescence. *PLoS One, 7* (8), 42-191. Doi: 10.1371/journal.pone.0042191

Puranik, H., Koopman, J., & Vough, H. C. (2019). Pardon the interruption: an integrative review and future research agenda on work interruption. *Researchgate*. DOI:10.1177/0149206319887428

Quam, R. et *al*. (2018). Procedural memory, working memory, and declarative memory skills are each associated with dimensional integration in second-category learning. *Frontiers in Psychology*. DOI: 10. 3389/fpsyg.2018.01828

Richards, J. H. (1987). Time management: A review. *Work & Stress, 1* (1), 73-78.

Riedel, W. J., & Blokland, A. (2015). Declarative memory. Handbook of experimental pharmacology.

Robert, S., & Wyer, Jr. (2006). Three models of information processing: an evaluation and conceptual integration. *Psychological Inquiry, 17 (3),* 185-255.

Roediger, H. L., & Butler, A. C. (2011). The critical role of retrieval practice in long-term retention. *Trends in Cognitive Sciences, 15* (1), 20-27. Doi: 10.1016/j.tics.2010.09.003

Sabiniewicz, A., & Sorokowski, P. (2017). Adaptive changes in human memory: a literature review. Journal of Education Culture and Society, 79-87. DOI: 10. 15503/jecs20171.79.87

Sadoski, M., Goetez, E. T. & Rodriguez, M. (2000). Engaging Texts: Effects of Concreteness on Comprehensibility, Interest, and Recall in Four Text Types. *Journal of Educational Psychology, 92* (1), 85-95.

Shipstead, Z., & Engle, R. (2012). Is working memory effective. Psychological Bulletin. DOI : 10. 1037/a0027473

Sindhgatta, R., et *al* (2010). Timesheet assistant: mining and reporting developer effort *ASE 2010, 25th IEEE/ACM International Conference on Automated Software Engineering.*

Siriganjanavong, V. (2013). The mnemonic keyword method: Effects on the vocabulary acquisition and retention. *English Language Teaching, 6* (10). Doi: 10.5539/elt. v6n10p1

Sumrall, W., et *al*. (2016). A review of memory theory. *International Journal of Humanities and Social Science, 6 (5),* 23-30.

Tracy, B. (2004). Time power: A proven system for getting more done in less time than you ever thought possible. New York: American Management Association.

Tracy, B. (2013). *Time management*. USA: American Management Association.

Vaden, R. (2015). Procrastinate on purpose: 5 permissions to multiply your time. Penguin publishing group.

Wong, L. (2009). Essential study skills: sixth edition. USA: Houghton Mifflin Company.

Appendix A

Students' Questionnaire

Dear student,

You are kindly asked to answer this structured questionnaire which is administered to gather the needed information in order to accomplish our Master Dissertation. The questionnaire aims at figuring out whether students use time management skills effectively. In addition, it aims at tackling the issue of managing time effectively in relation to information processing, retention and recall. As well as, the influence of effective time management skills on the processing, retention and recall of information. The questionnaire is anonymous and your answers remain confidential. Hence, you are politely invited to answer the following questions either by ticking the option(s) that seem appropriate for you, or by making full and complete answers. Bear in mind that your answers will be crucial for the success of this research.

Thank you for your cooperation

Miss. Chafia SOUAHLIA and Mrs. Yassamine KSOURI

Department of Letters and English Language

University of 8 Mai 1945-Guelma

Section One: General Information

1. Age: ……. years.
2. How long have you been studying English? (Including this year) ……... Years.
3. How could you describe your level in English?

Good	
Average	
Bad	

Section Two: Information Processing, Retention and Recall

4. Do you face problems in processing information?

Yes	
No	

-If yes, which one of these problems you face the most? (One option)

Overload of information	
Information processing disorders (visual, auditory, sensory disorders)	
Rate of delivery of information	
The ineffective encoding of information	
Lack of attention	

5. Do you think that the better information is organized the easier information processing will be?

Yes	
No	

6.Does the degree of information familiarity play a role in successful information processing?

Yes	
No	

7. Which channel do you prefer when processing certain information?

Visual	
Acoustic	
Elaborative	
Semantic	

8.Is processing, retaining and recalling information?

conscious	
unconscious	

9. What are the most effective strategies in information retention and recall? (three options)

Chunking	
Storytelling	
Acronyms	
Acrostics	
The link method (association)	
Visualization	
The keyword method	
The loci method	

10. Do you agree that relying on some strategies for storing information may result in a better information recall?

Totally disagree	
Neither agree nor disagree	
Totally agree	

11. How often do you use strategies of information retention and recall in order to remember particular information?

Always	
Usually	
Sometimes	
Rarely	
Never	

12. Do you feel you are able to recall information whenever necessary?

Always	
Usually	
Sometimes	
Rarely	
Never	

13. Do you think that memory training is an effective medium for successful information recall?

Yes	
No	

-If yes, why is memory training an effective medium for successful information recall?

it improves your academic performance	
It enhances your practice focus	
It enhances your brain's ability to process and store positive information	
It improves your neural plasticity	
All the above	

14. To what extent is encoding and processing information important for storing and recalling it?

Not important	
Important	
Very important	

15. Do you think that presenting some stimuli may have an impact on information recall?

Yes	
No	

16. Which factors could have a great influence on information retention and recall? (three options)

Attention	
Rehearsal	
Sleep	
Reward	
Testing effect	
Mnemonics	
Comprehension	
Motivation	

Section Three: The Role of Effective Time Management in Enhancing Information Processing, Retention and Recall

17. Do you think that time management is important?

Yes	
No	

18. How often do you plan your time management?

Yearly	
Monthly	
Weekly	
Daily	
Never	

19. How often do you stick to your time planning?

Always	
Usually	
Sometimes	
Rarely	
Never	

20. Do you compile and prioritize a written daily “To-Do” list?

Yes	
No	

-If yes, do you complete all items on your daily “To-Do” lists?

Not all	
Nearly all	
All	

21. Which of the following time management skills is the most effective in time control? (one option)

Good organization	
Prioritization (from priority)	
Efficient scheduling	
Using planning tools (calendar, digital applications…)	
Planning in relation to goal-setting	
Managing external time wasters (phones, visitors, meetings…)	
Avoiding multi-tasking (switching from a task to another)	

22. Do you allocate a specific time for learning outside the classroom (eg. revision, homework…)?

Yes	
No	

-If yes, do you incorporate time management skills in reviewing your lessons?

Yes	
No	

-Why do you mainly do so?

For a better information processing	
For a better information retention and recall	
Both	

23. Are you affected by the following external time-wasters?

	Yes	No
Family obligations		
Phone calls		
Social media		
Watching TV		
Hobbies		
Games		
Unexpected visitors		

-If yes, to what extent are you affected by the above-mentioned time-wasters?

To a great extent	
To a moderate extent	
To a limited extent	

24. Do you take action to minimize interruptions or intrusions on your time schedules?

Yes	
No	

25. Do you easily overcome procrastination?

Yes	
No	

26. Do you set deadlines for your tasks?

Yes	
No	

-if yes, do you usually meet your tasks' deadlines?

Yes	
No	

27. How do you feel when you have many tasks to do in a short period of time?

Very stressed	
Stressed	
Not stressed at all	

28. Do you use technology for organizing your time?

Yes	
No	

-If yes, which one of these technological tools you use the most?

Computers	
Smartphones	
Laptops	
Tablets	

29. How often do you rely on the following time management skills to process, retain and recall information whenever needed?

	Always	Usually	Sometimes	Rarely	Never
Good organization					
Prioritization (from priority)					
Efficient scheduling					
Using planning tools (calendar, digital applications…)					
Planning in relation to goal-setting					
Managing external time wasters (phones, visitors, meetings…)					
Avoiding multi-tasking (switching from a task to another)					

30. Do you usually evaluate time management skills to see how they worked for you in relation to information processing, retention, and recall?

Yes	
No	

31. Do your teachers encourage you to use time management skills while processing the learned information?

Yes	
No	

32. Could effective time management lead to high academic achievement?

Yes	
No	

Section Four: Further Suggestions

If you have any other suggestions, recommendations or comments, we would be very grateful if you add them below.

……

……

……

……

……

Thank you for your cooperation

ملخص

تسعى الدراسة الحالية إلى تقصي تأثير مهارات إدارة الوقت على معالجة المعلومات والاحتفاظ بها ومن ثم استرجاعها. مبدئيا، يهدف البحث إلى استكشاف أراء الطلبة اتباعا للأهداف المسطرة وأسئلة الموضوع. حيث افترضنا أن الإدارة الفعالة للوقت تؤثر تأثيرا كبيرا على معالجة المعلومات والاحتفاظ بها واسترجاعها. وللتحقق من صحة الفرضية تم تطبيق المنهج الوصفي من خلال توزيع استبيان الكتروني للحصول على بيانات كمية حيث تم إرسال نسخة إلكترونية من الاستبيان إلى طلبة ماستر سنة ثانية بقسم اللغة الإنجليزية، جامعة 8 ماي 1945. وقد أكدت النتائج المتحصل عليها التأثير القوي للإدارة الفعالة للوقت على معالجة المعلومات والاحتفاظ بها واسترجاعها. ولهذا يجب أخذ مهارات إدارة الوقت بعين الاعتبار لتحسين قدرات الطالب الذهنية.

Résumé

L'étude actuelle cherche à étudier l'impact des compétences en gestion du temps sur le traitement, la rétention, puis la récupération des informations. En principe, la recherche vise à explorer les opinions des étudiants en fonction des objectifs énoncés et des questions thématiques. Nous avons supposé qu'une gestion efficace du temps influe considérablement sur le traitement, la rétention et la récupération de l'information. Et pour vérifier l'hypothèse, l'approche descriptive a été appliquée pour atteindre les objectifs souhaités en distribuant un questionnaire, et aussi pour obtenir des données quantitatives. Exceptionnellement, une copie électronique du questionnaire a été envoyée à cent et un étudiants du département de langue anglaise de l'Université du 08 mai 1945. Ainsi, les résultats obtenus confirment la forte influence des compétences en gestion du temps sur le traitement, la rétention et la récupération des informations. C'est pourquoi les compétences en gestion du temps doivent être prises en compte pour améliorer les capacités mentales chez l’étudiant.