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Theme:

The contribution of the pomodoro technique into enhancing student's memory

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Dedication:

Every Challenging work needs self-efforts as well as guidance, help and support of those who are close to your heart.

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We dedicate this humble work to our sweet and loving

Father, Mother, our siblings and our beloved friends

Whose affection, love, encouragement and prayers of day and night make us able to get such success and honor,

Along with our hard working and respected supervisor, Dr Fellah.

List of tables (Chapter 02)

List of tables: (Chapter four)

List of tables

List of figures :

Table of Content

General Introduction

Chapter one: human's memory

Table of Content

Chapter two: the pomodoro technique

GENERAL INTRODUCTION

Title: the contribution of the pomodoro technique in improving students memory.

1. Statement of the problem:

Memory is the foundation of enhancing learning, both in the classroom and beyond. It can easily be stated that students with good memory can perform well in school, excel in examinations, and achieve better grades. However, one thing to note here is that no one is born with sharp memory skills; they have to hone these skills with time and reshape their brains . The more they utilize these skills, the better their memory gets. Like any other skill, constant practice and training your brain with the pomodoro memory technique that works with our brain and not against it will facilitates the student's memorization through having breaks between sessions that helps the information sinks into the brain and enhances their brain functioning . for that reason researchers argued that the best way to enhance your memory /memorization is the pomodoro memory technique . hence , the following question is stated : How does the pomodoro techniques enhance / improve the student's memory ?

2 .Research Questions:

-The following questions are to be addressed:

- How does the pomodoro technique improve the students' memorization?
- Does the pomodoro technique contribute into enhancing student's memorization?
- Students who use this time management method, do they memorize better?

3. Hypothesis:

In consideration of the above questions, it is hypothesized that the pomodoro technique plays a major role in enhancing/improving the student's memory and students who tend to use this technique memorize better than those who doesn't.

4. Objectives of the research:

This study is going to be conducted for a number of objectives:

- To introduce a new memory technique that will help students develop their memory .
- To investigate the existed relationship between the pomodoro technique and memory.
- To identify the importance of this management method and its effects on our memory.
- To show the difference between the students who tend to use this method and those who doesn't.

In this way the students will be aware of the importance of the pomodoro technique and its impact on their memory and they will be able to easily memorize .

5. Significance of the Research :

The aim of this study is to provide information about how your memory works and offer the pomodoro technique as a useful strategie to assist in the process of recalling , this study goes beyond simple rote memorization to whole brain techniques which will help you unleash your powerful memory.

6. Research Methodology and Design

6.1. Choice of the Method:

This research is going to be conducted through the descriptive (quantitative) method as an appropriate way for investigating the effects of the pomodoro technique upon student's memory.

6.2. Populations and Sampling:

The target population in the study is Master2 students at the department of English at Khenchela University. The sample has been chosen randomly. It will consist of forty students who will have a chance to answer the questionnaire.

This population has been chosen for specific purpose:

-Master 2 students are chosen because it is absolutely clear that they going to write their dessertations , so they are more aware of the importance of using this technique in order to develop their memory so it will facilitate their work.

7. Data Gathering Tools :

For this study, one questionnaire is going to be used. It is going to be handed to **forty** students from the university of Khenchela .

8.The Organization of the Study:

This research is basically divided into four chapters: chapter one examines human's memory in general , chapter two represents a detailed report about the pomodoro technique that can be used to develop and improve our memory, as for chapter three, which explain the

relationship between the pomodoro technique and memory, and chapter four which is the practical part that contains the questionnaire and the analysis of the data gathered.

9. Definitions of Key Terms :

9.1 The pomodoro technique:

The **pomodoro technique** is a time management method based on 25-minute stretches of focused work broken by 3-to-5 minute breaks and 15-to-30 minute breaks following the completion of four work periods. **(** Cirrilo, Francesco. *The Pomodoro Technique: The Acclaimed Time-Management System That Has Transformed How We Work,* p. 35.)

9.Memory:

According to Spanish Royal Academy, memory is a function of the brain that allows humans to acquire, store and retrieve information about different types of knowledge, skills and past experiences. It is one of the most studied human functions in Psychology.(Staniloiu, Angelica; Markowitsch, Hans J. (2012-11-01).)

Chapter one :
Human Memory

Introduction :

This chapter aims at presenting memory as an important part of human beings that can affect our memorization, first this chapter presents a conceptual definition of human memory, then gives a general idea about how it is formed , and then we put some lights on the different types of memory followed by the process of memory (how it works) . Another aspect that is dealt with in this chapter is memory and its relationship with both memorization and the brain (intelligence) and how can we improve our memory in general (boosting memory).

1) What's memory?

A memory is a function of the brain that allows humans to acquire, store and retrieve information about different types of knowledge, skills and past experiences. It is one of the most studied human functions in Psychology. (Collins Dictionary of Medicine, 2004)

According to the Spanish Royal Academy(2004,p.11), Memory is a basic and essential function in our lives because it is present in all the activities you do every day, human memory is often compared to the storage capacity of a computer, the differences are in the way of retrieving stored memories or files.

The computer recovers a file without any modification or change, regardless of when it has been stored; while memories recovered from memory can be modified by many factors.

Memories can be influenced by other memories, by the reception of new information, by your creativity, by your capacity for invention. It can also happen that you modify the memories to fit your expectations.

2) How we form memories?

The process of encoding a memory begins when we are born and occurs continuously. For something to become a memory, it must first be picked up by one or more of our senses. A memory starts off in short-term storage. learning how to tie our shoe, for example. Once we have the process down, it goes into our long-term memory and we can do it without consciously thinking about the steps involved.

(*https://www.youtube.com/watch?v=ZU4suR_uXbg*)

Important memories typically move from short-term memory to long-term memory. The transfer of information to long-term memory for more permanent storage can happen in several steps. Information can be committed to long-term memory through repetition; such as studying for a test or repeatedly taking steps until walking can be performed without thinking; or associating it with other previously acquired knowledge, like remembering a new acquaintance Mrs. Emerald by associating her name with an image of the green jewel.

Motivation is also a consideration, in that information relating to something that you have interest in is more likely to be stored in your long-term memory. That's why someone might be able to recall the stats of a favorite baseball player years after he has retired . (Simon & Schuster, 1982)

Students are typically not aware of what is in their memory until they need to use that bit of information. Then they use the process of retrieval to bring it when they need to use it.

3) Types of memory:

since the memory is formed by a set of very different systems or subtypes of memory that are each responsible for a certain function, For this reason, the expression “I have very good / bad memory” is not correct, but most likely you are good or bad in some of the subtypes of memory that from memory and not in memory in full.

Memory is divided into the following memory systems or subtypes: sensory memory; the short-term memory, in which we find short-term memory and working memory; and, finally, long-term memory. (Pogue Press/O’Reilly, 2008)

1) Sensorial memory

According to Simon and Schuster (1982, p.32) Sensory memory is a very brief (about three seconds) recall of a sensory experience, such as what we just saw or heard. Some compare sensory memory to a quick snapshot of what you just experienced that quickly disappears.

This memory system has a great capacity for processing because it is responsible for recognizing the sensations perceived.

Sensory memory is a system or subtype of memory that in turn is formed by two other subtypes:

a) Iconic Memory:

Responsible of recording the visual stimuli and has a holding capacity around 300 milliseconds.

b) Ecoica memory:

Simon stated (1982, P .45) that ecoica memory responsible of temporarily storing the auditory stimuli when they disappear and has a greater retention capacity, around 10 seconds.

Although the sensory memory has a very short duration, thanks to this system you are able to remember the sounds you just heard and the details of the images you just saw

2) Short term memory:

Within the short-term memory, we find two memory systems: short-term memory and working memory or operating memory.

A)Short term memory:

is a system that has the ability to retain information for short periods of time, Its storage capacity is limited, approximately 7 plus minus 2 items for 18-20 seconds and For this reason, we are able to remember a phone number for a few seconds and after a few moments, we forget. (Robinson, 2008)

so if we want to remember a phone number that we have just been told or any other element, we should review it mentally until we learn it, which will mean that the information has been transferred to the long term.

b) Working memory:

Robinson argue (2008, p .22) that working memory it is an active memory system that holds information temporarily during the organization and execution of a task. That is, working memory allows us to manipulate the information necessary for us to cope with the tasks required.

Although its storage capacity is limited, thanks to this memory system we can perform several mental tasks at once, such as understanding, reasoning, retaining information, acquiring new knowledge and solving problems, The working memory or operating memory is closely related to long-term memory, which provides the information necessary to perform the tasks.

If we stop to think, working memory is involved in any kind of mental activity, such as reading comprehension, mathematical operations, task organization, and goal setting.

3) Long-term memory :

When we talk about memory in general, we actually mean the long-term memory, which is responsible for storing your memories, the knowledge you have about the world, the images you have seen, the concepts you have learned…ECT

the long-term memory has different types ;declarative memory or explicit memory and procedural memory or implicit memory. (Science Daily, 17 May 2016)

declarative or explicit memory:

This system of memory refers to facts that you can consciously and intentionally remember and is divided into two new subtypes:

A) Episodic memory:

also called autobiographical memory, it is responsible of storing our own experiences, When a friend asks us what we did last weekend and we tell him all the plans we made, who we were with and how we spent it, we are actually using episodic memory to respond because we are talking about what we have experienced .

. ***B) Semantic memory***:

it is the one in charge of storing the knowledge that we acquire, for instant, When we are taught an apple and we are asked what kind of fruit it is, we are using semantic memory to respond, basically we use the knowledge we have acquired throughout our life to answer that question ; Thanks to the semantic memory we are able to associate words, symbols, and concepts, we are able to know the capital of our country and the name of the president of the government…ect

Procedural or implicit memory:

It is acquired and used unconsciously, and can affect thoughts and behaviors. It allows people to perform certain tasks without conscious awareness of these previous experiences; for example, remembering how to tie one's shoes or ride a bicycle without consciously thinking about those activities.

4) How does memory works:

According to Judith Hooper and Dick (1986, p.67) the more we know about our memory, the better we'll understand how we can improve it; Have you ever wondered how we manage to remember information for a test? How we create new memories, store them for a periods of time, and recall them when we need them, how many times a day we rely on our memory to help us function, from remembering how to use our computer to recollecting our password to log-in to our online bank account, your baby's first cry...the taste of our grandmother's cookies...the scent of an ocean breeze. These are memories that make up the ongoing experience of our life; they provide us with a sense of self. They're what make us feel comfortable with familiar people and surroundings, tie our past with our present, and provide a framework for the future. In a profound way, it is our collective set of memories, our "memory" as a whole that makes us who we are.

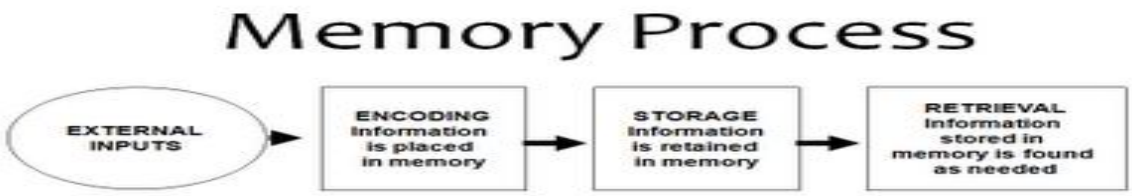
Most people/students talk about memory as if it were a thing they have, like bad eyes or a good head of hair. But our memory doesn't exist in the way a part of our body exists; it's not a "thing" we can touch. It's a concept that refers to the process of remembering, In the past, many experts were fond of describing memory as a sort of tiny filing cabinet full of individual memory folders in which information is stored away, But today, experts believe that memory is far more complex and elusive than that and that it is located not in one particular place in the brain but is instead a brain-wide process.

Do you remember what you had for breakfast this morning? If the image of a big plate of fried eggs popped into your mind, that memory was the result of an incredibly complex constructive power, our "memory" is really made up of a group of systems that each play a different role in creating, storing, and recalling our memories. When the brain processes information normally, all of these different systems work together perfectly to provide cohesive thought.

What seems to be a single memory is actually a complex construction. If we think of an object say, a pen our brain retrieves the object's name, its shape, its function, the sound when it scratches across the page. Each part of the memory of what a "pen" is comes from a different region of the brain. The entire image of "pen" is actively reconstructed by the brain from many different areas. Neurologists are only beginning to understand how the parts are reassembled into a coherent whole.

If we ‘re riding a bike, the memory of how to ride the bike comes from one set/part of brain cell and the memory of how to get from here to the end of the block comes from another, the memory of biking safety rules from another; and that nervous feeling you get, from another. Yet we're never aware of these separate mental experiences, nor are they coming from all different parts of our brain, because they all work together so well. In fact, experts tell us there is no firm distinction between how you remember and how you think.

This doesn't mean that scientists have figured out exactly how the system works,They still don't fully understand exactly how you remember or what occurs during recall, The process of memory begins with encoding, then proceeds to storage and, eventually, retrieval. **(**http://www.skepdic.com/memory.html**)**



1) Encoding:

Judith Hooper and Dick (1986, p.73) states that **Encoding** is the first step in creating a memory. It's a phenomenon that is rooted in the senses, it begins with perception, for example, the memory of the first person we’ve ever fell in love with. When we’ve met that person, our visual system likely registered physical features, such as the color of their eyes and hair. our auditory system will pick up the sound of their laugh and we probably noticed the scent of their perfume, we may even have felt the touch of their hands, all of these different sensations traveled to the part of your brain called the hippocampus, which integrated these perceptions as they were occurring into one single experience, your experience of that specific person.

Experts believe that the hippocampus, with the help of another part of the brain called the frontal cortex, is responsible for analyzing these different sensory inputs and deciding if they're worth remembering or not . If they are, they may become part of your long-term memory.

Although a memory begins with perception, it is encoded and stored using the language of electricity and chemicals.

The connections between brain cells aren't fixed -- they change all the time. Brain cells work together; they organize themselves into groups that specialize in different kinds of information processing. As one brain cell sends signals to another, the connection between the two gets stronger. The more signals sent between them, the stronger the connection grows. For that reason, with each new experience we face, our brain slightly rewires its physical structure. In fact, how we use our brain helps determine how our brain is organized.

To properly encode a memory, we need first to pay attention and Since we cannot pay attention to everything all the time, things are simply filtered out, and only a few stimuli pass into our conscious awareness because If we remember every single thing that we noticed, our memory would be full before we even leave the house in the morning.

2) Storage:

Short and Long Term Memory:

Once a memory is created, it must be stored (no matter how brief the memory is). Many experts think that there are three ways we store memories: first in the sensory stage; then in short-term memory; and ultimately, for some memories, in long-term memory. Because there is no need for us to maintain everything in our brain, the different stages of human memory function as a sort of filter that helps to protect us from the flood of information that we're confronted with on a daily basis.

The creation of a memory begins with its perception: The registration of information during perception occurs in the brief sensory stage that usually lasts only a fraction of a second. It's our sensory memory that allows a perception such as a visual pattern, a sound, or a touch to stay for a brief moment after the stimulation is over.

After this the sensation is stored in short-term memory , our Short-term memory has a limited capacity; it can hold about seven items for no more than 20 or 30 seconds at a time, this capacity somewhat can be increased by using various memory strategies /mechanics . For example, a ten-digit number such as 8005840392 may be too much for your short-term memory to hold. But if we divide it into chunks, as in a telephone number, 800-584-0392 may actually stay in our short-term memory long enough for us to remember the telephone number. Likewise, by repeating the number to ourselves, we can keep resetting the short-term memory clock.

Important information is gradually transferred from short-term memory into long-term memory. The more the information is repeated or used, the more likely it is to eventually end up in long-term memory, or to be "retained." (That's why studying helps people /students to perform better on tests.) Unlike sensory and short-term memory, which are limited and decay rapidly, long-term memory can store unlimited amounts of information indefinitely

students tend to more easily store material on subjects that they already know something about, since the information has more meaning to them and can be mentally connected to related information that is already stored in their long-term memory. (*http://www.amazon.com/exec/obidos/ISBN=0673467899/roberttoddcarrolA/*)

3) Memory Retrieval :

When students want to remember something, they retrieve the information on an unconscious level, bringing it into their conscious mind at will. While most students think they have either a "bad" or a "good" memory, in fact, most of them are fairly good at remembering some types of things and not so good at remembering others. If we assume that they have troubles remembering something it’s usually not the fault of our entire memory system but an inefficient component of one part of it.

For instant how you remember where you put your eyeglasses, when you go to bed at night, you need to register where you place your eyeglasses; You must pay attention while you put them on your bedside table. You need to be aware of where you are putting them, or you won't be able to remember their location the following morning. Next, this information is retained; ready to be retrieved at a later date. If the system is working properly, when you wake up in the morning you will remember exactly where you left your eyeglasses.

If you've forgotten where they are, one of several things could have happened:

- You may not have registered clearly where you put them down
- You may not be able to retrieve the memory accurately.
- You may not have retained what you registered.

Therefore, if you want to stop forgetting where you left your eyeglasses, you will have to work on making sure that all three stages of the remembering process are working properly.

If we've forgotten something, it may be because we didn't encode it very effectively, because we were distracted while encoding, or because we're having trouble retrieving it. If we've "forgotten" where we put our eyeglasses, we may not have really forgotten at al instead, the location of our eyeglasses may never have gotten into our memory in the first place. For example, we probably would say that we know what a five-dollar bill looks like, but most of the times that we've seen one, we've not really encoded its appearance, so that if we tried to describe it, we probably couldn't.

(http://www.amazon.com/exec/obidos/ISBN=0205279481/roberttoddcarrolA/)

Robert (1998) argue that the Distractions that occur while we're trying to remember something can really get in the way of encoding memories. If we »'re trying to read a business report of an article in the middle of a busy airport or anywhere else, we may think we're remembering what we read, but we may not have effectively saved it in our memory.

Finally, we may forget because we're simply having trouble retrieving the memory. If we've ever tried to remember something one time and couldn't, but then later we remember that same item, it could be that there was a mis-match between retrieval cues and the encoding of the information we were searching for.

5) MEMORY & THE BRAIN:

5.1) the brain:

The brain is the centre of the **nervous system**. It allows them to collect information (**sensory system),** act on that information **(motor system)** and store the result for future reference (**memory),** thus effectively making life possible.(http://thebrain.mcgill.ca/)

The **human brain** is the most complex living structure known in the universe. Although it has the same general structure as the brains of other mammals, is over three times as large as the brain of a typical mammal and much more complex. The adult human brain weighs on average about 1.5 kg , and it is about the size of a small head of cauliflower, It is very soft (having a consistency similar to soft gelatin)and, despite being referred to as "grey matter", the live brain is actually pinkish-beige in color (although it may turn grey after death) and slightly off-white in the interior ;The interior white matter provides most of the brain's structure and communications, while the grey matter that surrounds the white matter provides most of the thinking functions .

Almost 80% of the brain consists of water 10-12% being fatty lipids and 8% protein. Although it accounts for just 2% of body weight, it uses fully 20-25% of the body's **oxygen** supply, **nutrients**, and **glucose**.

It is very complex organ that has more than 100 billion **neurons** passing signals to each other via 1,000 trillion **synaptic connections**. It continuously receives and analyzes **sensory information**, responding by controlling all our actions and functions. It is also the centre of **higher-order thinking**, learning and memory, and gives us the power to think, plan, speak, imagine, dream, reason and experience emotions.

(http://thebrain.mcgill.ca/flash/a/a_07/a_07_cr/a_07_cr_tra/a_07_cr_tra.html)

5 .2) parts of the brain involved with memory:

Memory is a complex function that involves multiple steps, starting with the input of the stimulus to the brain and ending with independent memory retrieval, human memory is made up of three basic stages: sensory memory, where information is derived from touch; visual or aural; short-term memory and long-term memory. The different steps in memory retention take place throughout the brain.

But the real question is are memories stored in just one part of the brain, or are they stored in many different parts of it? The expert Karl Lashley (1950) began exploring this problem, about 100 years ago, First, Lashley trained rats to find their way through a maze. Then, he used the tools available at the time, (soldering iron) (to harm the rats' brains, specifically in the cerebral cortex). He did this because he was trying to erase the program, or the original memory trace that the rats had of the maze.

Lashley was actually surprised, because the rats were still able to find their way through the maze, regardless of the size or location of the injury. Based on his creation of the brains injury and the animals' reaction, he formulated this hypothesis: if part of one area of the brain involved in memory is damaged, another part of the same area can take over that memory function (Lashley, 1950).

Many scientists believe that the entire brain is involved with memory. However, since Lashley's research, other scientists have been able to look more closely at the brain and memory. They have argued that memory is located in specific parts of the brain, and The main parts of the brain involved with memory are **the amygdala**, **the hippocampus**, **the cerebellum**, and **the prefrontal cortex :**

THE AMYGDALA:

The main job of the amygdala is to regulate emotions, such as fear and aggression; the amygdala plays a part in how memories are stored because storage is influenced by stress hormones. For example, one researcher experimented with rats and the fear response (Josselyn, 2010). He shocked the rats foot. This produced a fear memory in the rats. So that, each time they heard the tone, they would freeze (a defense response in rats), indicating a memory for the impending shock.

The amygdala is also involved in memory consolidation: the process of transferring new learning into long-term memory. The amygdala seems to facilitate encoding memories.(The amygdala is involved in fear and fear memories.)

THE HIPPOCAMPUS:

Another group of researchers also experimented with rats to learn how the hippocampus functions in memory processing; They harmed the hippocampus of the rats, and found that the rats demonstrated memory weaknesses on various tasks, such as object recognition and maze running. They concluded that the hippocampus is involved in memory, specifically normal recognition memory (Clark, Zola, & Squire, 2000). Another job of the hippocampus is to show information to cortical regions that give memories meaning and connect them with other connected memories. It also plays a part in memory consolidation: the process of transferring new learning into long-term memory.

Injury to this area leaves us unable to process new declarative memories. One famous patient, known for years only as H. M., had his (hippocampus) removed in an attempt to help control disease he had been suffering from for years . As a result, his declarative memory was significantly affected, and he could not form new semantic knowledge. He lost the ability to form new memories, yet he could still remember information and events that had occurred before the surgery.

The cerebellum and the prefrontal cortex:

Although the hippocampus seems to be more of a processing area for explicit memories, you could still lose it and be able to create implicit memories, thanks to your cerebellum, For example, one classical experiment is to blink when they are given a puff of air. When researchers damaged the cerebellums of rabbits, they discovered that the rabbits were not able to learn the eye-blink response (Steinmetz, 1999; Green & Woodruff-Pak, 2000)

Other researchers have used brain scan, to learn how people process and retain information. From these studies, it seems that the prefrontal cortex is involved. In one of the studies , participants had to complete two different tasks: either looking for the letter *a* in words (considered a perceptual task) or categorizing a noun as either living or non-living (considered a semantic task) . Participants were then asked which words they had previously seen. Recall was much better for the semantic task than for the perceptual task.

NEUROTRANSMITTERS:

There also appear to be specific neurotransmitters involved with the process of memory, such as epinephrine, dopamine, serotonin, glutamate, and acetylcholine …ECT (Myhrer, 2003). There continues to be discussion and debate among researchers about the specific role of each neurotransmitter. Despite the fact that we don't yet know which role each neurotransmitter plays in memory, we do know that communication between neurons via neurotransmitters is important for developing new memories.

It is also believed that strong emotions trigger the formation of strong memories, and weaker emotional experiences form weaker memories; this is called arousal theory (Christianson, 1992). For example, strong emotional experiences can leads to the release of neurotransmitters, and hormones, which strengthen our memory; that's why , our memory for

an emotional event is usually better than our memory for a non-emotional event. When humans and animals are stressed, the brain release more of the neurotransmitter glutamate, which helps them remember the stressful event. This is clearly evidenced by what is known as the flashbulb memory phenomenon.

A flashbulb memory is an exceptional clear remembering of an important event, for instant; the 9/11 terrorist attacks; Most likely people can remember where they were and what they were doing. In fact, survey found that for those Americans who were age 8 or older at the time of the event, 97% can recall the moment they learned of this event, even a decade after it happened.

Even flashbulb memories can have decreased accuracy with the passage of time, even with very important events. For example, a journalist asked the president George. W Bush how he heard about the terrorist attacks of 9/11. In January 2002, less than 4 months after the attacks, He responded**: « I was sitting there, and my Chief of Staff—well, first of all, when we walked into the classroom, I had seen this plane fly into the first building. There was a TV set on. And you know, I thought it was pilot error and I was amazed that anybody could make such a terrible mistake. » (Greenberg, 2004, p. 2)**

Contrary to what President Bush recalled, no one saw the first plane hit, except people on the ground near the twin towers. The first plane was not videotaped because it was a normal Tuesday morning in New York City, until the first plane hit.

So human memory, even flashbulb memories, can be weak. In fact, memory can be so weak that we can convince a person that an event happened to them, even when it did not. In studies, research participants will recall hearing a word, even though they never heard the word. For example, participants were given a list of 15 sleep-related words, but the word "sleep" was not on the list. Participants recalled hearing the word "sleep" even though they did not actually hear it (Roediger & McDermott, 2000).

6) Memory and intelligence:

We students needs t to know How much does our intelligence rely on our ability to hold ideas in our mind, It turns out that memory and intelligence are *very* closely related, to the point that some have questioned if they could be the same thing. Your memory, especially your working memory, can significantly influence your "intelligence". That is, your memory

affects your ability to quickly and easily retrieve and apply stored information in situations when you need to solve a problem, and your ability to solve problems is often defined as intelligence. Therefore, memory and intelligence are almost like two sides of the same coin.

For example, people who are seen as being good at maths are often able to solve problems in their head and the reason they can do this easily is because they can quickly retrieve stored information which allows solving the problem successfully. They are not necessarily more "intelligent" overall but rather, they are able to store mathematical data in their long-term memory and retrieve it quickly when they need it. However, the two are linked and improving your memory can help you to display what is commonly seen as "intelligence".

In the early 1990's, a series of studies conducted by Kyllonen and Christal came to the conclusion that a specific type of memory is almost similar with our ability to reason.

Working memory or immediate memory; it's your capacity to store several images and sounds in your head at the same time. Kyllonen and Christal's studies found a great relationship between working memory and intelligence. In a series of four experiments, they measured people's reasoning ability as well as their ability to hold different items in their mind at the same time. They discovered that these two abilities *were 80 to 90* percent correlated.

The results were so striking that many scientists began to question whether this could actually be true, was the ability to reason really the same thing as the capacity to hold ideas in your head at the same time?

Kyllonen and Christal (1995) discovered that, under some circumstances, working memory tests were much worse at predicting intelligence. In particular, speed was a big part of this. Somebody with small working memory tended to work more slowly. But speed isn't necessarily a factor *in* reasoning.

In other words, processing speed is more closely related with memory than intelligence is, suggesting that it's *not* the same thing. Even so, working memory is so closely related to intelligence that it begs the question, if you could upgrade your working memory, would it boost your intelligence?

Up until recently, nobody thought it was possible to improve what we call "fluid intelligence." Crystallized intelligence, which measures what might be called wisdom, can be improved with practice and training. But fluid intelligence appears to be biologically predetermined.

At least, that's what we thought before Susanne Jaggy and her colleagues conducted a very controversial experiment in 2008.

Sussanne jeaggi (2008) argued that the brain can dramatically improve on almost any task with practice; it's rare to find evidence to suggest that training on one task improves performance on another one.

In her experiment, improvement on a *working memory* task transferred to a very different test of *fluid intelligence*. This suggested that it *really was possible* to improve reasoning ability.

The test conducted was called the dual N-Back**.** The participants were asked to look at a series of symbols appearing on a checkerboard while listening to other symbols. This was a modification of a working memory test, but the participants weren't just being tested. They were training.

Compared with the control group, the participants saw a dramatic increase in performance on a fluid thinking test. The more they trained, the better the results. It looked like a slam dunk (an old sport cartoon), especially when they replicated the study in 2010.

Jaeggi's experiment (2008) didn't come out of thin air, either. It was inspired by an experiment conducted in 2002 by Torkel Klingberg, in which a memory training test helped ADHD children on several tasks, including fluid intelligence tests. But then came the studies by Redick and Chooi. They failed to replicate Jaeggi's results.

We *can* tell you that a recent study found changes in the regions of the brain associated with working memory after one of these training programs was put into place. We can also tell you that many of the brain training games produced by companies like CogMed and Luminosity appear to be effective.

We can tell you exactly how the relationship between memory and intelligence works, and we can definitively say that training programs will enhance it, because that's how science works. It's a process, not a body of facts, and that's how it should stay.

6) Boosting memory:

A strong memory depends on the health and vitality of your brain. Whether you're a student studying for final exams, a working professional interested in doing all you can to stay mentally sharp, or a senior looking to preserve and enhance your grey matter as you age, there's lots you can do to improve your memory and mental performance.

It's said that you can't teach an old dog new tricks, but when it comes to the brain, scientists have discovered that this old saying simply isn't true. The human brain has the ability to adapt and change—even into old age. This ability is known as neuroplasticity. With the right stimulation, your brain can form new neural pathways, changing the existing connections, and adapt and react in ever changing ways.

The brain's incredible ability to reshape itself holds true when it comes to learning and memory. You can use the natural power of neuroplasticity and different memory techniques (the pomodoro)to increase your cognitive abilities, enhance your ability to learn new information, and improve your memory at any age. (Clark, Zola, & Squire1994).

Conclusion:

This chapter presented memory as a complex yet a very important element of the human beings brain , this chapter also dealt with important elements like the process of memory , types of memory , memory and the brain …ECT and finally boosting our memory(how to improve our memory) was used as an element to close the first chapter, and open the second one in which light will be shed on the pomodoro technique which is considered the best technique in order to improve our memory .

Chapter TWO :
The Pomodoro Technique

Introduction

This chapter aims at presenting the Pomodoro Technique First, it proposes how this basic idea for pomodoro technique came to the mind to its creator “Francesco Cirillo “as a preface, then it introduces the pomodoro technique inventor and the author of the pomodoro technique book.

Second, it provides a definition of pomodoro technique and its goals. This chapter also focuses on the objectives of pomodoro technique (How to apply it to reach incremental objectives) and its results.

Finally, the pomodoro technique is chosen to be as the best tool to enhance student’s memory

Preface

Francesco Cirillo, its creator, came up with the idea in the late 80s, during his first year at university.

He proposed to himself that he wanted to check if he could study non-stop for 10 minutes, really focusing on the task in order to get rid of or overcome a time of low productivity and high confusion, bad memory, and that disheartened feeling of not knowing what to do which has been caused by the high number of interruptions and distractions and the low level of concentration and motivation. To do so, He needed a timer and as any Italian he found a tomato-shaped timer in the kitchen.

Francesco found out that after some attempts over a certain period and quite some effort, He was able to stop procrastinating and actually improved his concentration levels and memorization as well his study process.

He fine- tuned the technique and arrived at the ideal amount of time of focused work which is 25 minutes. After these 25 minutes, He would take 5 minutes break and go back to his task for another 25 minutes plus a 5 minutes break again and so on. After 4 blocks of studying and 4 breaks, He would take a longer break 15 minutes or 1 hour. Today, the pomodoro technique is widespread and quite popular as a study application.

Who is Francesco Cirillo?

Francesco Cirillo is the owner of Cirillo consulting, a consulting firm based in Berlin that works with the many of the world's largest companies. He created the Pomodoro Technique, a renowned time management tool used by millions of people all over the world, while a university student looking for a way to get more done in a less time.

Francesco's core focus has always been improving productivity and efficiency, by finding ways to achieve better results with less time and less effort. Francesco has worked at the forefront of the software industry more than 20 years. In a career spanning startups, multinationals and freelance consulting, He has mentored thousands of professionals, developers, managers and software teams.

(https://francescocirillo.com/pages/francesco-cirillo).

1. **Definition of the Pomodoro Technique**

The Pomodoro Technique is a time management method developed by Francesco Cirillo in the late 1980s. The technique uses a timer to break down work into intervals, traditionally 25 minutes in length, separated by short breaks. Each interval is known as**Pomodoro,** from the Italian word for **Tomato,** after the tomato-shaped kitchen timer that Cirillo used as university student.

(https://en.wikipedia.org/wiki/Pomodoro_Technique)

Pomodoro is a cyclical system, you work in short sprints, which make sure you're consistently productive. You also get to take short breaks to bolster your motivation and keep your creative.

(https://lif ehacker.com/productivity-101-a-primer-to-the-pomodoro-technique-1598992730)

2. **Goals of the pomodoro technique**

For Francesco Cirillo (2006, P.3) the aim of the pomodoro technique is to provide a simple tool / process for improving student's memory and productivity as well which is able to do the following:

- Alleviate anxiety linked to becoming.
- Enhance focus and concentration by cutting down on interruptions.

- Increases awareness of your decisions.
- Boost motivation and keep it constant.
- Bolster the determination to achieve your goals.
- Refine the estimation process, both in qualitative and quantitative terms.
- Improve your work or study process.
- Strengthen your determination to keep on applying yourself in the face of complex situations.

And I would like to add other few goals through experiencing or using this tool which are:

- It increases memory retention and helps people who suffer from short term memory to store information and retrieve them in time of need.
- It helps the information to sink into the brain through using brain breaks which are 5 minutes break between each 25 minutes session.
- It engages two modes of thinking: the focused mode and diffuse mode.
- It reduces the impact of internal and external interruptions on focus and flow.

Core process of the Pomodoro Technique

For many students, time is an enemy. We race against the clock to finish assignments, achieve tasks, memorize and review for exams and meet deadlines.

The Pomodoro Technique is the best tool for students to improve their study process, facilitate memorization way and brings new taste also challenges to life.

The core of the pomodoro technique process consists of 6 steps:

1. **Choose a task you'd like to get done.**

Something big, something small, something you've been putting off for a million years, it doesn't matter. What matters is that it's something that deserves your full, undivided attention.

For example: if you are a student and you have a pile of modules to revise in a short period of time to prepare yourself for the upcoming exams

2. **Set the pomodoro technique for 25 minutes.**

Make a small oath to yourself, I will spend 25 minutes on this task and I will not interrupt myself. You can do it after all, it is just 25 minutes.

3. **Work on the task until the pomodoro rings.**

Immerse yourself in the task for the next 25 minutes. If you suddenly realize you have something else you need to do, write the task down on a sheet paper.

4. **When the pomodoro rings, put a checkmark on a paper.**

Congratulations! You've spent an entire, interruption-less pomodoro on a task.

5. **Take a short break.**

Breathe, meditate, grab a cup of coffee, go for a short walk or do something else relaxing (i.e. not work-related) your brain will thank you later**.**

6. **Every 4 Pomodoros take a longer break.**

Once you completed four pomodoros, you can take a longer break.

20 minutes is good or 30 minutes. Your brain will use this time to assimilate new information and rest before the next round of pomodoros.

How to use the Pomodoro Technique like a Pro?

With a little focus and a better understanding of the science behind it, this technique may prove to be your secret weapon against the procrastination enemy.

According to Francesco Cirillo,(2006, P.3) the process underlying this technique consists of five stages:

What	When	Why
Planning	at the start of the day	to decide on the day's activities
Tracking	throughout the day	to gather raw data on the effort expended and other metrics of interest
Recording	at the end of the day	to compile an archive of daily observations
Processing	at the end of the day	to transform raw data into information
Visualizing	at the end of the day	to present the information in a format that facilitates understanding and clarifies paths to improvement

TABLE01: the process of the pomodoro technique

The stages of planning, tracking, recording, processing and visualizing are fundamental to the techniques.

In The Planning phase, Tasks are prioritized by recording them in a "to do list".

- This enables users to estimate the effort the task require. As pomodoros are completed, they are recorded, adding to a sense of accomplishment and providing raw data for subsequent self-observation and improvement.

The Pomodoro objectives

Francesco Cirillo organized in his book the six incremental objectives as follows: (2006. P.6)

Objective I: find out how much effort an activity requires.

At the beginning of the each day, choose the task you want to do from the to do list sheet, prioritize them, and write them down in the to do today sheet.

To do today	Khenchela,5 February 2020 Mizane Amina
Write an essay about artificial intelligence	
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE02: the to do list

1. **Start the first pomodoro**

Set the pomodoro for 25 minutes and start the first task on the to do today sheet. Don't forget to see how time is left, means the remaining time should always be visible.

The pomodoro can't be interrupted; it should be 25 minutes of pure work.

The pomodoro is indivisible, means that it can't be split up.

If a pomodoro is interrupted by someone or something, it should be considered as a void as it never had been set, then you have to make a fresh start with a new pomodoro. When the pomodoro rings, mark an **X** next to the activity that you have been working on and take a break for 3-5 minutes.

To do today	Khenchela,5 February 2020 Mizane Amina
Write an essay about artificial intelligence	X
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE03: (To do today sheet: the first pomodoro)

When the pomodoro rings that means the current activity is temporarily finished and you have to take a break for 5 minutes and you're not allowed to keep on working during the break even if you're convinced that in those few minutes you could complete the task at hand.

The aim of taking a few minutes of break is disconnect from work, to relax and let the brain assimilate the new information to be sinked into the brain which will help you to do better during the next pomodoro.

During the break you can do whatever you want but make sure don't involve yourself into mental activities or issues like taking about work related issues with a colleague or make imperative phone calls or writing important emails…etc. Because doing these kinds of things would block the constructive mental integration that you need to feel alert and ready for the start of the next Pomodoro. Once the break is over set the pomodoro for another 25 minutes and continues the activity at hand until it rings again. Then mark another **X** on the To Do Today sheet.

To do today	**Khenchela,5 February 2020 Mizane Amina**
Write an essay about artificial intelligence	**X X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE04: (To Do today sheet: The second Pomodoro)

Next comes the 5 minutes break, and then a new Pomodoro.

1.2 Every four pomodoros

Every four pomodoros, stop the activity you're working on and take a longer break from 15 to 30 minutes.

To do today	**Khenchela,5 February 2020 Mizane Amina**
Write an essay about artificial intelligence	**XX X X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE05: (To Do Today sheet: The end of the first set of pomodoros)

After completing the four pomodoros, the 15-30 minute break considered as the ideal opportunity to relax, to drink coffee or juice, to check the incoming email or take a quick walk or to tidy up your desk. The essential thing is to get yourself away from doing complex things that prevents from being ready or being able to give the next pomodoro your best effort. Obviously, during this break you shouldn't be thinking about what you did in the last pomodoro.

1.3 Completing an activity

Keep on working, Pomodoro after pomodoro, until you finish the task at hand and then cross it out on the To Do Today sheet.

To do today	**Khenchela,5 February 2020** **Mizane Amina**
~~**Write an essay about artificial intelligence**~~	**XX X X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE06: (To Do Today sheet: Completing an activity)

Francesco Cirillo mention in his book (2006. P .8) the specific cases that should be handled with common sense:

- If you finish a task while the pomodoro is still ticking, the following rule applies: if a Pomodoro Begins, It has to ring. It's a good idea to take advantage of the opportunity for over learning, using the remaining portion of the pomodoro to review or repeat what you've done, make small improvements, and note down what you've learned until the pomodoro rings.
- If you finish an activity in the first five minutes of the pomodoro and you feel like the task was actually already finished during the previous pomodoro and revision wouldn't be worthwhile, as an exception to the rule the current Pomodoro doesn't have to be included in the pomodoro count.

Once the current activity has been successfully completed, move on to the next one on your list, then the next, taking breaks between every pomodoro and every four pomodoros.

To do today	**Khenchela,5 February 2020 Mizane Amina**
~~Write an essay about artificial intelligence (max 15pps)~~	**XX X X X**
~~Explain all the difficult terms in the essay~~	**X X**
~~Memorize the topic by heart for the presentation~~	**X X X**

TABLE07: (the completed pomodoro's)

1.4 Recording

According to Francesco Cirillo (2006. P. 8) the completed pomodoros can be transferred in a hard-copy archive. As an alternative it may be more convenient to use an electronic spreadsheet or a database, and delete the completed activities from the inventory sheet.

The primary goal of tracking and recording is simply to provide a report with a number of pomodoros completed per task and how much effort you have put to accomplish each activity. To do so the author Francesco Cirillo (2006. P. 8) recommend the following boxes that can be used: the date, start time, type of activity, description of the activity, the actual number of pomodoros, a short note on the results achieved, and possible room for improvement, or problems that may have come up. This initial recording model actually represents the report you want. It's easy to draw up, even on a paper.

Records					Mizane Amina
Date	Time	Type	Activity	Actual Pomodoros	Notes
05feb 2020		Writing	Essay about artificial intelligence	5	15pps
05feb 2020		Explaining	Difficult terms explanation.	2	3 pps
05feb 2020		Memorizing	Topic memorization.	3	

TABLE08:(to do list/Completed pomodoro's)

The important thing in the Pomodoro technique is to track the number of pomodoros actually completed: the real effort. This point is the key to understanding the pomodoro technique. And you had better not forget to track the start times for activities.

1.5 Improvement

Recording helps people in terms of self-observation and decision-making.

For instance, When I started using the Pomodoros Technique To get my task done I did a small self-observation in which I asked myself how many pomodoros a week I spend on work activities and how many pomodoros I do on an average day of the week, which pomodoro that could be eliminated, and how was the whole process, effective or not.

As you see in the table above, it took me ten pomodoros to finish the whole activity from writing the given essay to explaining the difficult terms to finally memorizing it. Actually I spend a great amount of time doing the activity because the essay was scientific, it contains difficult terms that I myself want to fully understand them, besides it requires attention and concentration to be memorized. Here I could say that this activity needed effort and more pomodoros than other activities I did before that required less pomodoros and less effort. And I remain improving my study process and doing activities through using this popular tool till today.

Objective ii: Cut down on interruptions

Francesco in his book (2006. P. 9) says that “The length of a Pomodoro, 25 minutes, seems short enough to make it possible to resist being distracted by various kinds of interruptions. But experience shows that once you’ve started using the Pomodoro Technique, interruptions can be a real problem. That’s why an effective strategy is needed for minimizing unhandled interruptions and progressively increasing the number of pomodoros that can be accomplished consistently without interruptions”. There are two kinds of interruptions: internal and external.

1. **Internal interruptions- We interrupt ourselves**

Usually, you can afford to take 25 minutes before calling back a friend or replying to an email. You’ll learn how to handle the inevitable interruption while staying focused on the task at hand.

When it comes to study or to accomplish many tasks per day, several interruption might appear in your way to prevent from doing what you want to do, and the creator of these interruption unfortunately is actually "**You"**, and you even find it hard to overcome or to manage these interruption, among these interruptions: the need to stand up and get something to drink or eat, call a friend, talk to your siblings or you mom, check Instagram or YouTube notifications…etc.

These kinds of distractions, or ways to procrastinate the activity at hand, are called internal interruptions, they are often associated with having a little ability to concentrate.

So the Question that comes to everyone's mind is:

How can we free ourselves from these internal interruptions?

Hopefully, the answer and the method to manage internal interruptions are given by the author Francesco Cirillo in his book "The Pomodoro Technique" (2006. P.10)

He says that "we have to work on two fronts simultaneously":

- Make these interruptions clearly visible. Every time you feel a potential interruption coming on, put an apostrophe (') on the sheet where you record your pomodoros. Then do the following:
- Write down the new activity on the To Do Today Sheet under Unplanned and urgent if you think it's imminent and can't be put off.
- Write down in the activity inventory, marking it with "U" (unplanned); add a deadline if need be.
- Intensify your determination to finish the current pomodoro. Once you've marked down the apostrophe, continue working on the given task till the Pomodoro rings. (Rule: Once a pomodoro begins, it has to ring.)

We will have an example that will help us clarify the dynamic of handling internal interruptions.

As I started my first pomodoro to write an essay about artificial intelligence, I felt the urge to call my friend to find out what is the deadline of handing over our essays? Then I asked myself "is this really urgent" Do I have to do it right now? No, I can put it off. May be an hour or more. Maybe even until evening! I put an apostrophe on the To Do Today Sheet

next to the current activity. Add an item to the Activity Inventory for unplanned activities (marked with a "U") and continue with the pomodoro.

To do today	**Khenchela,5 February 2020 Mizane Amina**
Write an essay about artificial intelligence (max 15pps)	**‘ X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	

TABLE09: To Do Today sheet: An internal interruption.

Activity Inventory	
Call a friend: when's the last date of handing over the essay	
…	
…	

TABLE10: Activity Inventory sheet: An unplanned activity.

Then I asked myself: Does this activity have to be done tomorrow? No, it just has to be done by the end of the week. So I added a deadline next to the "U"

	Activity Inventory	
(08 Feb)	**Call a friend: when's the last date of handing over the essay**	
	…	
	…	

TABLE11: Activity Inventory sheet: An unplanned activity with a deadline.

For example if I get a sudden craving for a pizza or tacos 10 minutes later. I'll mark down another apostrophe but this time I'll note this activity on the To Do Today Sheet under Unplanned & urgent. Then I continue with my pomodoro.

To do today	**Khenchela,5 February 2020 Mizane Amina**
Write an essay about artificial intelligence (max 15pps)	**‘ ‘ X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	
Unplanned & urgent	
Order a Pizza or Tacos	

TABLE12: (To Do Today Sheet: An urgent internal interruption)

Up to this point, the pomodoro hasn't been interrupted. It's kept on ticking and I have continued working, dealing with interruptions in a wise way by putting an apostrophe up the checkmarks. Finally the Pomodoro rings. I record it with an "X" and take a quick break of 5 minutes, then I started the second pomodoro.

To do today	**Khenchela,5 February 2020 Mizane Amina**
Write an essay about artificial intelligence (max 15pps)	**‘ ‘ X X**
Explain all the difficult terms in the essay	
Memorize the topic by heart for the presentation	
Unplanned & urgent	
Order a Pizza or Tacos	

TABLE13: (To Do Today sheet: Urgent internal interruption, First Pomodoro)

Now, I bet you are wondering when I ordered the pizza. Actually I ordered the pizza when I finished the whole four pomodoros, because it was urgent and I was hungry so I have waited until I finish the whole block of pomodoro to order it. When exactly? At the long break of 30 minutes so that I can get the delivery without interrupting the next pomodoros.

The butter of the topic; Internal interruptions are considered as a normal thing that happen to any person at this planet, dealing with it, it’s what makes the difference.

If it happens to be internally interrupted during the start of your first pomodoro, write down under the unplanned and urgent list your thing and don’t forget to put an apostrophe above the X mark until you finish your pomodoro session.

As discussed by Francisco Cirillo (2016), If you have to interrupt a pomodoro either because you give in to temptation or something really urgent comes up, there’s only one thing to do: void the current pomodoro as if you don’t started it, and even if it’s about to ring (Because it cannot be considered as a finished pomodoro) Then mark down an apostrophe to

keep track of the interrupted pomodoro, obviously you can't mark the unfinished pomodoro with an X.

So take 5 minute break and start with a new pomodoro, then the next pomodoro will go better.

2. **External interruption :**

External interruption inevitably happen to any student at least 3 or 4 interruption per day, especially if the study place is crowded with people or noisy either at home or at any environment that requires communication, being active and talkative.

For example: You can get interrupted by any member of your family asking you about something or doing something.

You can get interrupted by a phone call of a friend.

As discussed Francisco Cirillo (2016), the main objective of pomodoro technique is not to get interrupted by any sort of interruptions that prevents the flow of study and which call for the ability to protect the ticking pomodoro, and as we have made the effort to eliminate the internal interruptions we have to do the same for external interruption that might prevent us from having the pleasure of making an X on the to do today sheet or get the pomodoro done which equals getting the work done.

If you wonder how to dial down external interruptions ideally, you just have to tell the person you're in the middle of something (make a joke of it if you want, can't talk now dude, I'm in the middle of a pomodoro) and catch up in 25 minutes or a few hours, depending on how urgent it was.

If a pomodoro absolutely has to be interrupted either due to human weakness or a real emergency, there's only one thing to do which is to void the pomodoro with a dash in your check box. (Yes, even if it is just about to ring!)

Brain breaks help students focus and better retain information, and help ideas sink in.

Pomodoro technique is considered as a highly effective way to study and work.

So let's talk a little bit about brain break:

Brain break is a short period of time of 5 or 10 minutes when we change the boring and ineffective routine or way of getting information that usually arrives at well known roadways.

Our brains are wired for novelty and as humans we pay attention to every stimulus in our environment that feels threatening or out of the ordinary.

Tokuhama Espinosa (2014) stated that "We are hardwired to scan the environment for things that are new and therefore attract our attention. This shifts our attention mode and jumpstarts our capacity to notice things".

Barbara Oakley (2014) claims that "We have two modes of thinking and that in order to learn effectively we must go back and forth from one to the other, In the focused mode, we are concentrated practicing the content we are trying to learn. In the diffuse mode, we are engaged in another task, not deliberately thinking about the content, simply resting our brains and letting the new information sink in"

To use her own words: if you want to climb a mountain, you need to do the hard work (focused mode) and stop at the base station to relax, rest and check your gear (diffuse mode) a couple of time too

Atkinson and Schifrin's (1968) Multi-store model stated that "If we start losing the stimuli from our environment and we start losing input, which means that the information will not even have the chance to transition from sensory memory to short term memory to long term memory".

Means that if we take a brain break through using the pomodoro technique, it refreshes our thinking and helps the information sink in or discover another solution to a problem and get back the attention mode. During these few minutes, the brain moves away from learning, memorizing and problem solving to incubating and processing new information through transmitting it to short term memory to long term memory.

So, as students we have to incorporate brain breaks into our learning style or method because they help activate, energize and stimulate our brain also they improve our concentration and relieve stress.

According to some researchers and scientists, some brain breaks focus on discussion or some specific verbal task thus the most effective brain breaks incorporate some level of

physical movement in order to stimulate neurological pathways and help hemispheres of the brain work together.

Students should have a kinesthetic break every 25-30 minutes.

Brain breaks are research-based and their efficiency has been scientifically proven.

CONCLUSION:

This chapter focused on the pomodoro technique as a strategy to enhance students' memory , through giving them the objectives of pomodoro technique and how to apply it in order to reach a perfect memory recalling . In addition, the chapter stated many advantages and benefits of the pomodoro technique on many levels when applied effectively.

Chapter three :
the relationship between memory
and
the pomodoro technique

Chapter three : the relationship between memory and the pomodoro technique

Introduction:

This chapter aims at presenting the existed relationship between memory and the pomodoro technique; it explains the process of how does the pomodoro technique affect our brain and memory in general by giving different examples and experiments for consolidation.

The existed relationship between the pomodoro technique and memory:

During exams, most of students used to spending hours at a time memorizing facts, names of elements, articles, lessons, historical events. They end up founding themselves cramming the night before a test (they probably read through their notes over and over, drink a gallon of coffee / tea ...Etc.) In the hope that the piece of information they have memorized would somehow lodge in their brains and once the test is over, they doubtless forget everything right away.

In order to remember something we need to work with our brains and not against them, we need to find different ways to improve our memory and to do that we have to initially and clearly understand how does the construction of the human being memory function; This is when the pomodoro technique comes in. It's a famously useful phenomenon: it facilitates student's memorization through having breaks between sessions that helps the information sinks into the brain.

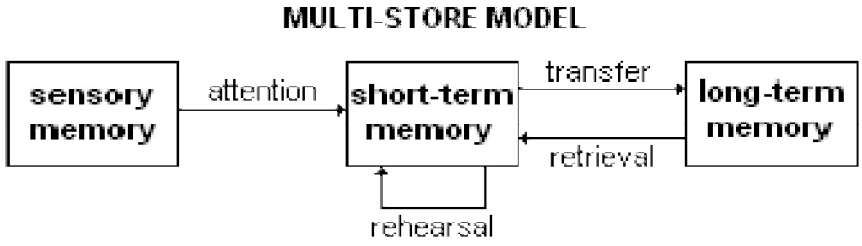
The latter has an influence upon memory and its complex functions that involves multiple steps (Encoding, Storage and retrieval)

It turns out that memory and the pomodoro technique are very closely related, our memory (Short- term memory, Long term memory) can significantly be improved throughout the pomodoro technique.

We are not computers and we cannot recall information whenever we want, and it never works quiet like we wish it would, so we tend to hack our memory with tools and such techniques that efficiently organizes information or memorization and retention that can be used to achieve near perfect recall.

Chapter three : the relationship between memory and the pomodoro technique

It is known that our attention span starts decaying after a couple of minutes. From personal experience during memorization we students start losing focus and quickly get bored, we stop getting the stimuli from our environment and we start losing input, which means that the information won't even have the chance to transition from sensory memory to short term memory to long term memory. Norman Doidge, M.D.(2009)



Now, if we look into the work of Stuart and Rutherford (1978), Davis (1993), Benjamin (2002), and McKeachie (2006), anywhere between 20 to 30 minutes seems to be the rule of our attention span and 25 minutes seems to be golden rule.

To use Barbara Oakley's words(2006,p.11) "if you want to climb a mountain, you need to do the hard work and stop at the base stations to relax and rest a couple of times" Which is the same thing in our memory system , for instance our short term memory has a limited capacity , it can hold about seven items for no more than 20 or 30 seconds at a time but the use of the pomodoro strategy may increase the chance of memorizing them easily , for example: a ten digit numbers such as 9876543211 may be too much for your short term memory to hold but divided it into chunks as in a phone number 987-654-3211- and memorizing it by taking a 5 minute break in every 30/25 min block session may actually stay in your short term memory long enough (it's like you keep resetting the short-term memory clock) .

According to Barbara (2006) important information is gradually transferred from short-term memory into long term memory. The more information is repeated or used, the more likely it is to eventually end up in long term memory, or to be "retained" (that's why studying helps people to perform better on tests.) Unlike sensory and short term memory, which are limited and decay rapidly, long term memory can store unlimited amounts of information indefinitely.

Chapter three : the relationship between memory and the pomodoro technique

David Eagle man in his book(the brain ,the story of you ,p.155) argue that since our memory is formed by a set of different systems that are each responsible for a certain function,and each system is located in a different part of the human brain , For this reason, the pomodoro strategy can only affect certain parts of the brain and not the brain as a whole, for instants ; this technique cannot be used on the sensory memory due to its temporarily holding capacity (300 milliseconds /10 seconds) so the pomodoro technique can not affect the part of the brain that is responsible of the sensory memory .

'people are not born equal' ; yet there is no such thing as smart and stupid students ; you only go so far by hard work and training your brain in a clever way and the pomodoro strategy can easily offer that; The technique goes beyond just setting a timer ; it will train your brain to retrieve/recall information whenever you need it and also it makes you enjoy learning .

Just as we can strengthen any other muscle in our bodies, we can train our brains to remember more and learn anything faster. You don't need to be born with a photographic memory Whether you need to study for an exam, want to learn a new language, hope to avoid embarrassing memory lapses (the name of your manager's), or simply want to stay mentally sharp, improving your memory is easier than it sounds. All it takes is trying out new memorization techniques and the pomodoro strategy is considered one of the well known and effective ones. David J. Piekarski (January 2017, Pages .123-144)

Scientists and philosophers have been trying to figure out how human memory works for at least 2,000 years and they're still making new discoveries. For example, in 2016, British scientists discovered a protein in the brain that plays a key part in memory formation and memory loss, and the pomodoro strategy with its 5 MINUTE breaks plays a major part helping producing this protein. Ezequiel M. Galarce (2015)

Still, we do know that there are basically three stages or steps to memory processing: encoding, storage, and recall.

It appears that the pomodoro technique resets our brains and it is critical for memory and learning ,by using this strategy our brain's neurons become over-connected with so much electrical activity so basically when we set a timer and take a break of 5 minutes every 30/25 minutes the brain consolidates facts and figures and new words, and recall information This

is retention territory, and without it the human brain (students) will easily lose focus and interest . Albert, Bruce. New York: Garland Science, 2002.

Alberts, Bruce (2002) argue that Our brains rely on oxygen to function properly, and to get that oxygen, we need a healthy flow of oxygen-rich blood to our brains; using such techniques with this triggers high levels of a protein called cathepsin B, which travels to the brain to trigger neuron growth and new connections in the hippocampus, an area in the brain believed to be critical for memory.

This memory technique will help you better remember details of anything you're learning, help you quickly remember words or phrases, It takes some work and creativity to memorize this way, but you'll retain that information much longer than if you just tried to memorize without it. but once you start using it you can reuse this for any future studies .

There's a universal favorite in brain-related sayings that goes: "**Use it, or lose it**". The mind needs to be trained, just like your body, and that's why memorization is considered as a skill The less we try to actively memorize information, the lazier the brain gets. It becomes harder to pick up new skills and study. Not to mention that it sets the groundwork for faster neuron deterioration as we grow older. Even though our minds should be young and quick until old age, we're facing a universal frustration of struggling to memorize a single phone number or a person's name way before that. National Institutes of Health,(2007. Web) .

Francisco (2017) in his technique states that this strategy is not going to help unless you actively commit to it. So, to get the full benefit of this strategy, you need to make memorization practice a habit.

If you need to force yourself to memorize something, it's clear your brain has trouble understanding why it's relevant to your knowledge. This is why this memorization technique comes down to a very simple core guideline: transform a piece of information with no context so it makes sense to you personally.

Altman J, Bayer SA (1997) argues that improving our memory capacity can become another form of self-care. As lazy as technology has made us, it's also providing us with countless fun and useful tools to get our brains back on track, we need to keep in mind that memory improvement doesn't work as a one-time solution.

Chapter three : the relationship between memory and the pomodoro technique

In the past two decades, we've become increasingly reliant on having phones and computers as memorization crutches. But if we understand it as an investment in our future mental health and if we used such strategies in order to develop and train our brains we will help improving our selves and develop our memory at the same time.

Students needs to understand the fact that this technique will help them avoid the lack of concentration and forgetfulness, and that It is not difficult to build a better brain because any one can reshape their brains and The scans revealed that smart students brains were not built differently from yours or mine –but- These scientists did find something distinctive, The smart student' brain showed unique patterns activity in regions that involved memory and cognition.

The researchers then put some of the rookies through a memory training program and observed how their brains changed with exercise, The more the normal students practiced the pomodoro memory training technique, the more their brain activity started to resemble the brains of memory of a smart student.

In fact it took only six weeks for the normal students who had never used memory techniques before to show an increase in brain power, these really incredible memory feats are not some form of inborn talent. It's really just training, and what these findings mean is that anything these smart people can accomplish we can actually accomplish it too. "Development and Developmental Disorders of the Human Cerebellum."(2003)

In the 20 the century an Italian Jesuit priest became the first westerner to pass China's highest civil service exams, The exam involved memorizing reams of classical poetry ,a task that only 1% of people who took the test were able to perform successfully, yet, Ricci passed these exams after only 10 years, despite not having spoken any Chinese before and he did it with the help of the pomodoro technique , never forget that During that time, the Chinese had their own diligent study methods and techniques that used repetition as memory aides .

Another example is the Memory champions who participate in China's popular reality and talent show « the beain » have used the pomodoro technique to memorize decks of cards or information about airline flights.

In each episode, seven contestants must perform mental challenges like memorizing the names and birthdays of over 900 infants or solving a series of Rubik's Cube completely blindfolded in under five minutes.

Feng, who is two time winner of the World Memory Championships, uses the same technique (pomodoro) of Ricci to exploit the brain's natural ability to memorize images and locations. Broccoli V, Simeone A Molecular Biology of the Cell. New York: Garland Science

Conclusion:

This chapter focused on the existed relationship between memory and the pomodoro technique , and gives detailed information about how does the pomodoro technique affect our memory and the process that our brain goes through in order to enhance our memory using this technique.

Chapter four : Data Analysis and Interpretation

Introduction

The whole chapter deals with the analysis of the student's questionnaire, and the present conducted research is centered mostly on finding out the role of the pomodoro technique in enhancing / improving the student's memory. The research device used to evidence the hypothesis affirmed previously is a questionnaire dealt with master two students of English. The participant's attitude and opinion are very important and helpful in the present study, The student's questionnaire intended to investigate the student's opinions and beliefs about the importance of the pomodoro technique as a fundamental factor in enhancing /Developing the students memory abilities, Moreover, the chapter categorizes the interpretation and the discussion of the data, pedagogical implications, and recommendations for future studies.

Aim of the questionnaire:

This questionnaire is designed to investigate student's memory abilities and their reactions toward the pomodoro memory technique. ,it is very essential to gather the students outlook and views about their memory abilities and the difficulties they face during memorization in order to provide them with efficient techniques(pomodoro) that aims to facilitate the process of studying/Memorizing.

Description of the Questionnaire

This questionnaire is a whole of 22 items divided into two sections. **Section one**: all about students background information. **Section two:** which is designed to investigate student's memory abilities and their reaction toward the pomodoro memory technique? ,and it engages different types of questions"closed"and "open-ended" question .closed questions involve students to answer "Yes" or"No" or by ticking one answer from a locate of options ,whereas; open-ended questions are addressed to students to affirm their points of views and share their previous knowledge about the subject.

Section one: students' background information (Q1_Q5)

This section seek to gather information about the participant's personal information concerning their memory ,for instant (Q3) students were asked to state if they were pleased with their current memory or not , and (Q6) they have to state if they are worried

About their memory abilities or not …ECT*

Section two: the pomodoro technique and memory (Q6_Q22)

the second section is generally designed to investigate the student attitude/Opinions/beliefs/ toward the contribution of the pomodoro technique in enhancing the students memory abilities, also this section aim to explore their perception about using memory techniques in order to enhance their memorization and most importantly to know their perspective about memory/Brain development , for example (Q7) informants needs to state their opinions about the use of memory technique in order to enhance their memory , (Q11) students were asked if they face any problems during recalling information and (Q18) participants are asked If their brain can be reshaped just like a muscle ….ECT

Sometimes some statements in form of questions were used in order to see how our participants react toward it, and to see if they truly understand how their memory works in general.

Administration of the questionnaire:

For this study, one questionnaire is going to be used. It is going to be handed to forty **(N: 40)** of master two students from the university of Khenchela, it was handed out in a

Friendly environment and all students were so collaborative, helpful and full graduate goes to them.

Analysis of the students' questionnaire.

Section one: Background Information

- **Q1: are you generally pleased with your memory?**

OPTION	Number	Percentage
Yes	**10**	**25%**
no	**25**	**62,5%**
maybe	**5**	**12,5%**
undecided	**0**	**0**
total	**40**	**100%**

Table01: student's Opinion about their memory abilities

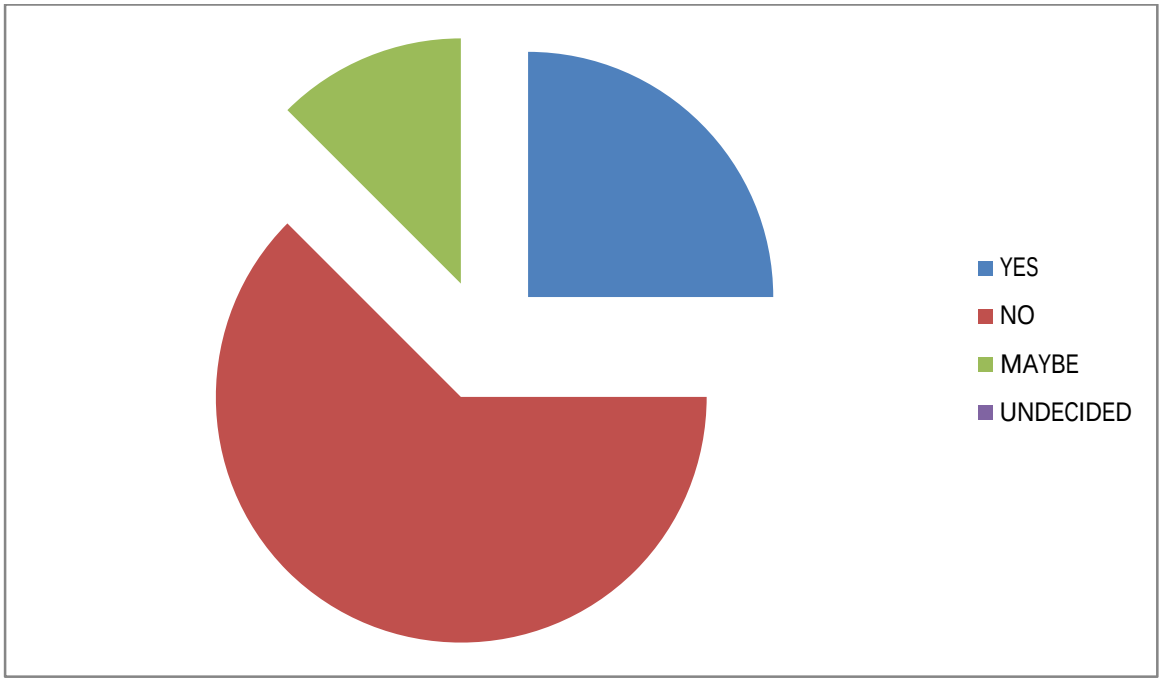


Figure01: student's Opinion about their memory abilities

According to the information in the table and chart above , the majority of students (62,5%) opted or chose option (b) , they choose no because they are not pleased with their memory abilities and this can be due to many factors, while (25%) said that they are pleased with their memory , and the other (12,5%) were not sure about their memory .

- **Q2: Is your memory worst than other people at your age?**

	Number	Percentage
YES	**17**	**42,5%**
NO	**15**	**37,5%**
MAYBE	**06**	**15%**
UNDECIDED	**02**	**5%**
TOTAL	**40**	**100%**

Table02: the difference between students memory and others memory at their age.

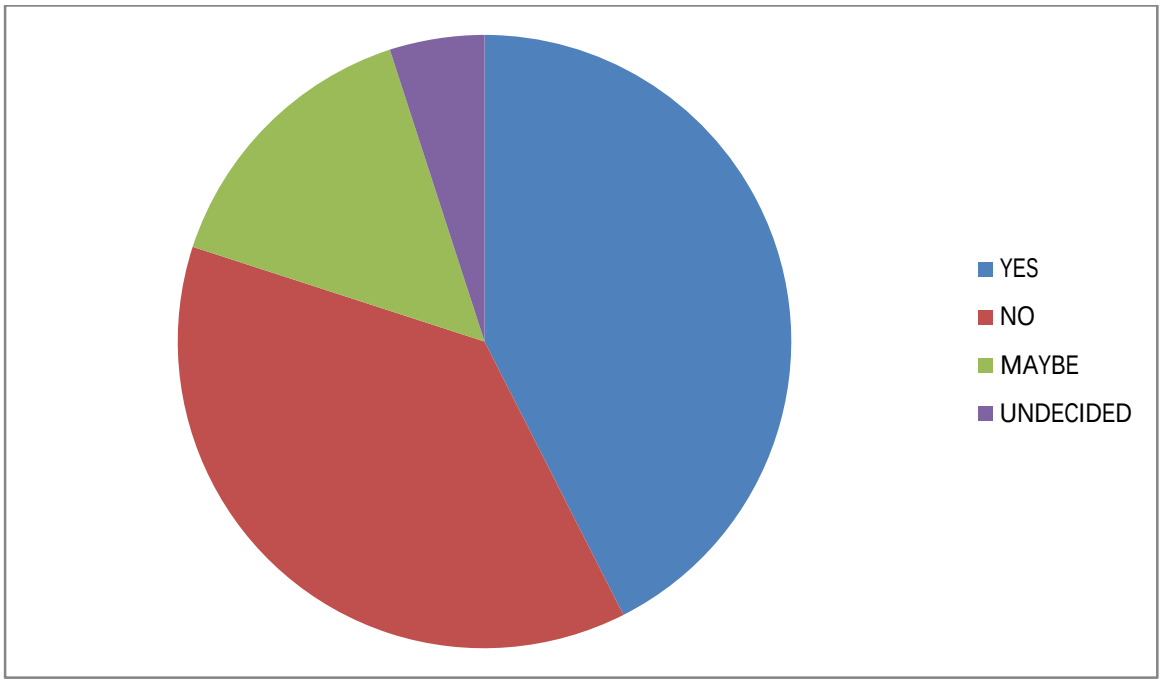


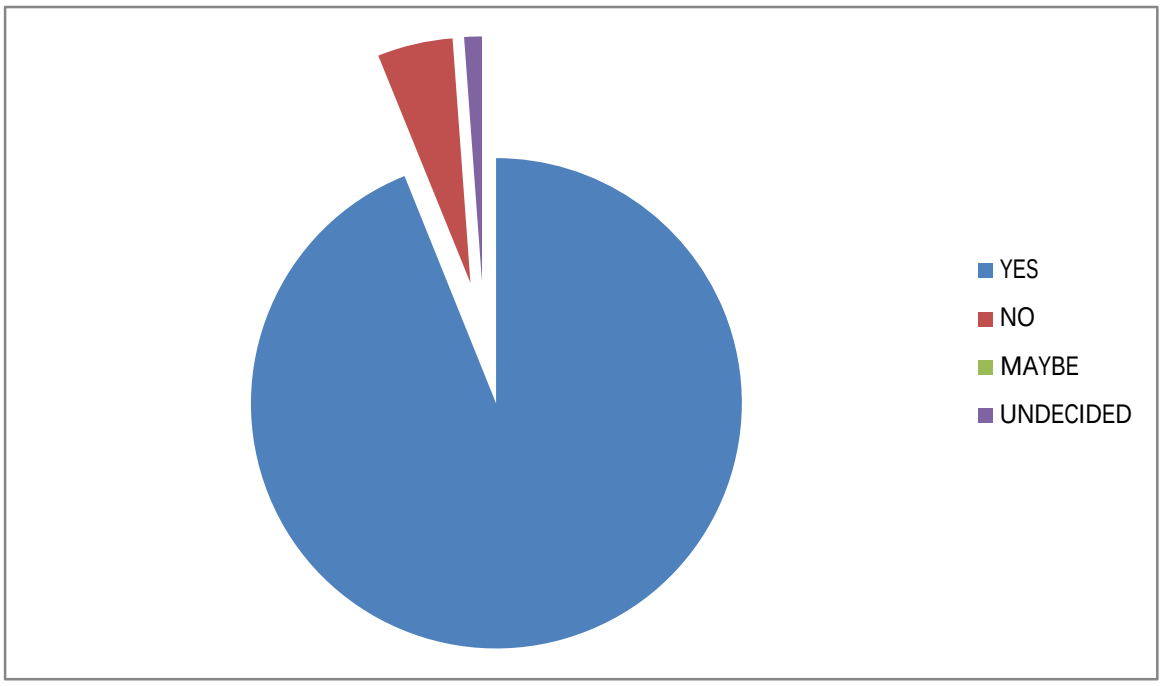
FIGURE02: difference between students memory and others memory at their age.

According to the statistics in the table and chart above the majority of students(42,5%) opted for option (A,Yes) admitting that their memory is worse than the memory of the students their age ,while (37,5%) of them claim that their memory is not worst than people their age , on the other hand (15%) were not sure if their memory is worst than their peers or not and the (5%) of our sample haven't made up their minds yet.

- **Q3: Are you worried that you will forget something important?**

Options	Number	Percentage
YES	**38**	**95%**
NO	**02**	**5%**
MAYBE	**0**	**0%**
UNDECIDED	**0**	**0%**
TOTAL	**40**	**100%**

TABLE03: student's concern about forgetting important information.



FIGUREO3: student's concern about forgetting important information.

As the table and the chart indicates, the majority of the student (95%) seem to have a big concern and worry about forgetting something important after memorizing it , while the remaining 5% of our informants answered (no) which denote that they don't face any difficulties during recalling information.

- **Q4: Are you worried about your memory abilities?**

options	NUMBER	PERCENTAGES
YES	4O	100%
NO	0	0%
MAYBE	0	0%
UNDECIDED	0	0%
TOTAL	40	100%

TABLE04: student's concern about their memory abilities.

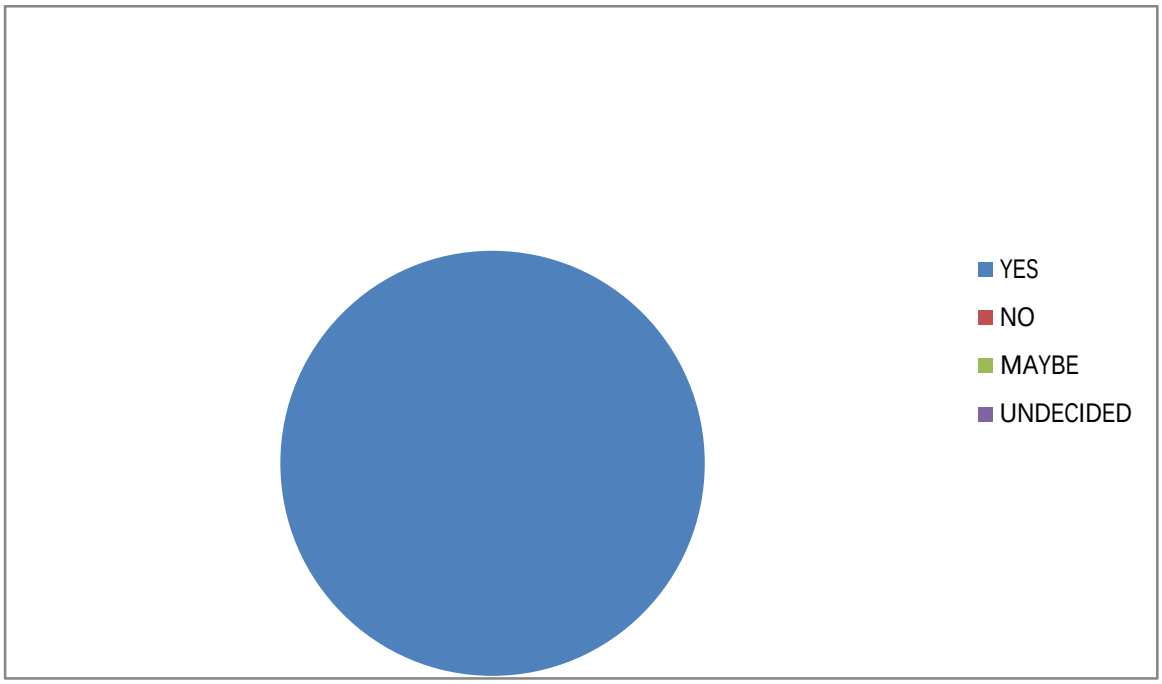


FIGURE04: student's concern about their memory abilities.

According to the table and the chart above the whole participants (100%) opted to choose option(A,YES) which literally expresses their concern about their memory abilities ,and that can be due to the lack of brain trainings and neglecting the importance of using such techniques.

SECTION TWO: the pomodoro technique and memory

Q05: do you support using memory techniques?

options	NUMBERS	PERCENTAGES
YES	23	57,5%
NO	17	42,5%
TOTAL	40	100%

TABLE05: how much does a student support the use of memory techniques?

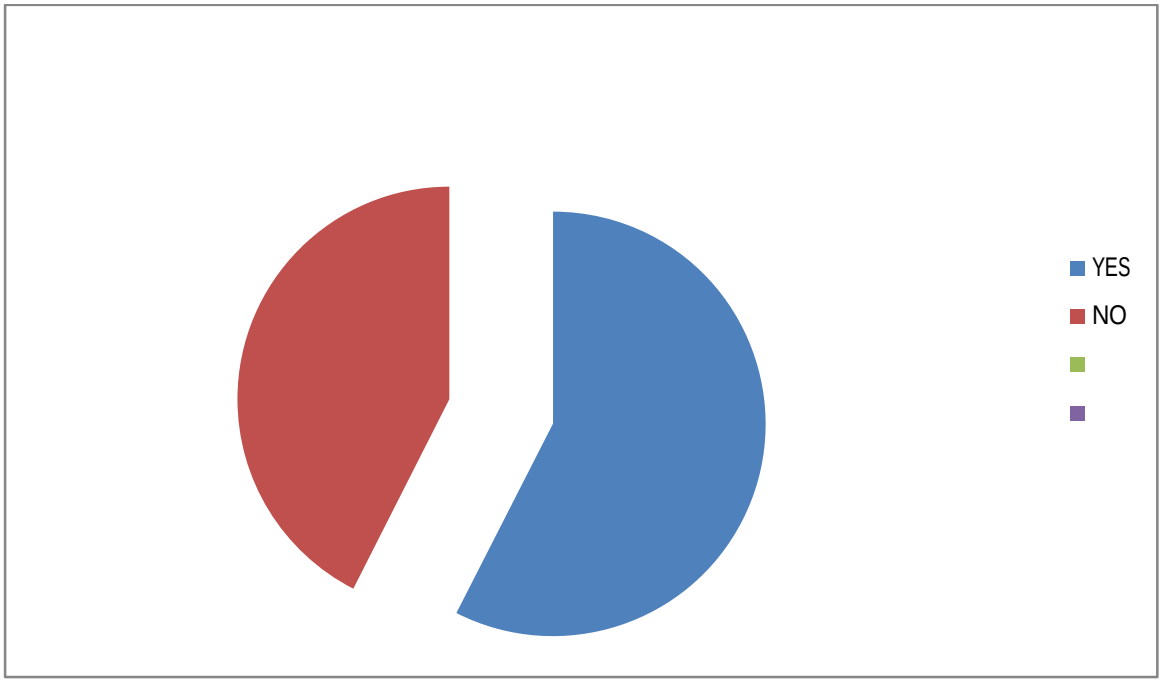


FIGURE05: how much does a student support the use of memory techniques?

According to the information mentioned in the table and chart above , more than half of the students (57,5%) do support using memory techniques for their own personal reasons thus due to their advantages and benefits , while (42,5%) of them do not tend to support the utilize of memory technique for unknown reasons .

1) **Q06: Are you familiar with the pomodoro technique ?**

options	numbers	Percentages
yes	18	45%
no	22	55%
total	40	100%

TABLE06: student's familiarization with the pomodoro technique

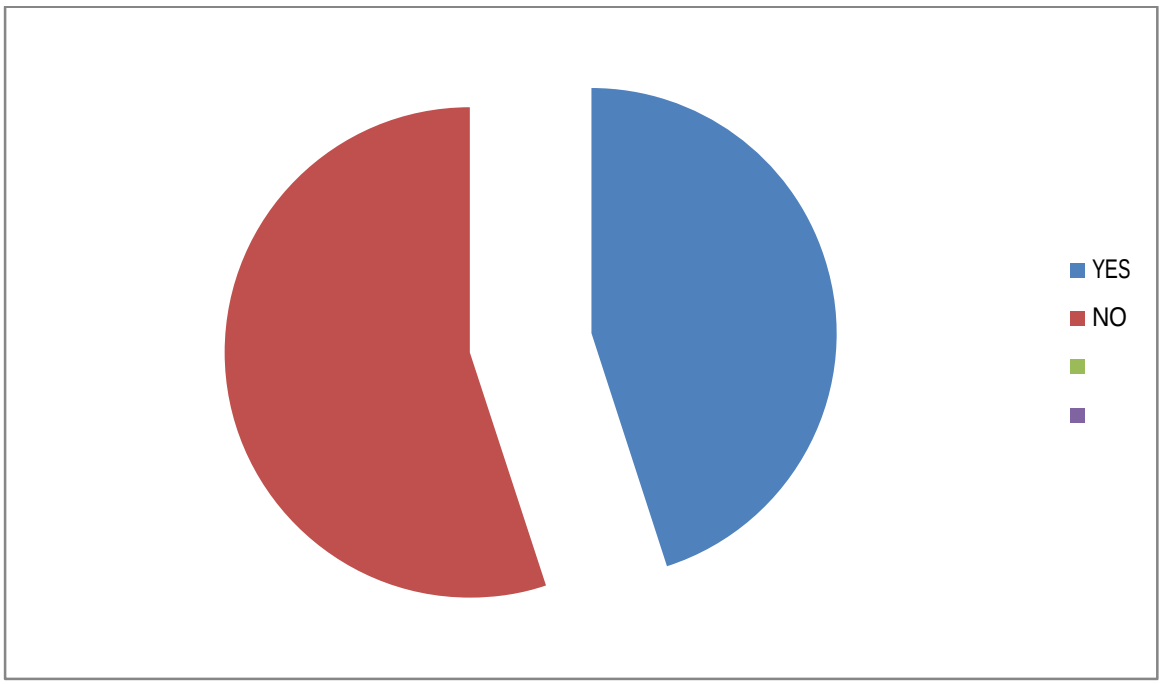


FIGURE06: student's familiarization with the pomodoro technique

The results deduced from the table and chart demonstrates that more than half of our respondents (55%) are not familiar with the pomodoro technique , which means they are new to it and its their first time knowing about it , however we have noticed that (45%) of them are already familiar with this memory technique and have probably use it before .

The (55%) of respondents who were familiar with the pomodoro technique argued that it's a life changing technique and it's a turning point in their way of studying, they claim that it helped them in revising and memorizing and retrieving information whenever they need it , also it helped information sink into the brain due to the time breaks between each study session .

Q07: How do you react to this statement: "we are all born equal in IQ"?

OPTIONS	numbers	percentages
agree	7	17,5%
Strongly agree	6	15%
disagree	13	32,5%
Strongly disagree	14	35%
total	40	100%

TABLE07: student's reactions to the statement «we are all born equal in IQ "

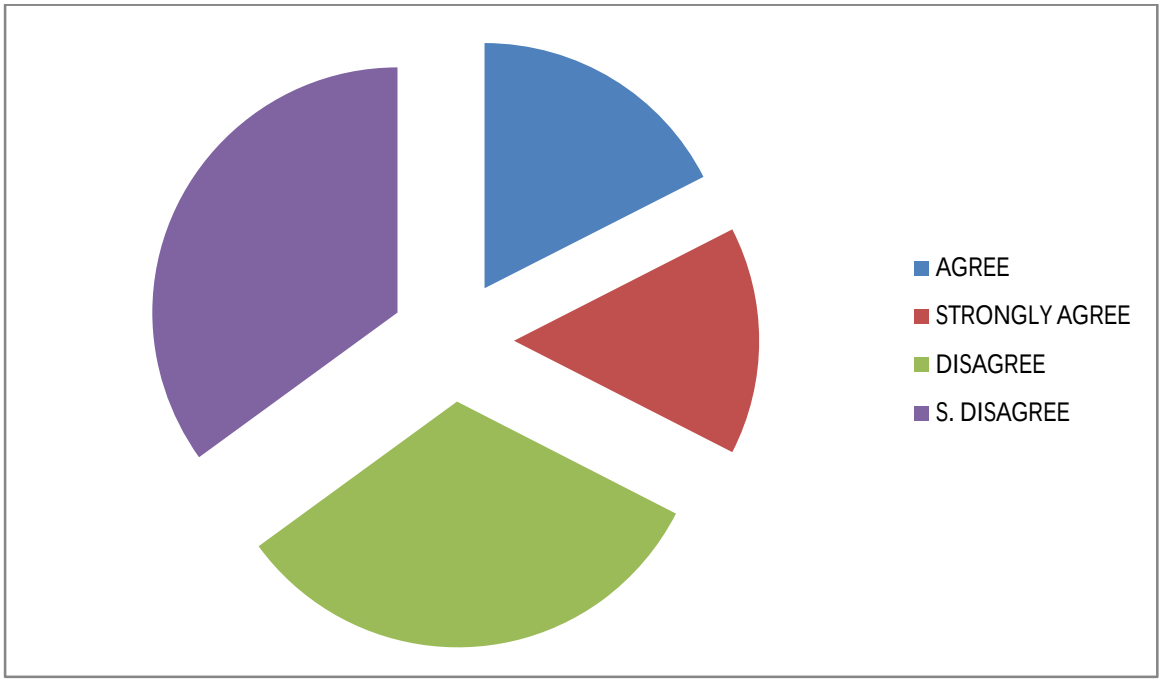


FIGURE07: student's reactions to the statement "we are all born equal in IQ "

Of the total respondents, (32, 5%) disagreed and (35%) strongly disagreed which means that the majority of the students thinks that we are all born with different IQ, Surprisingly (17, 5%) of the students agreed and (15%) strongly agreed with the suggested statement which indicates that they understand how does their memory work.

1) **Q08: To which extent do you agree or disagree with the idea of using / applying the pomodoro technique as a method of improving memory / retention process?**

Options	numbers	percentages
agree	6	15%
Strongly agree	18	45%
neutral	4	10%
disagree	10	25%
Strongly disagree	2	5%
total	40	100%

TABLE08: student's opinions about the use of pomodoro technique as a method in improving student's memory.

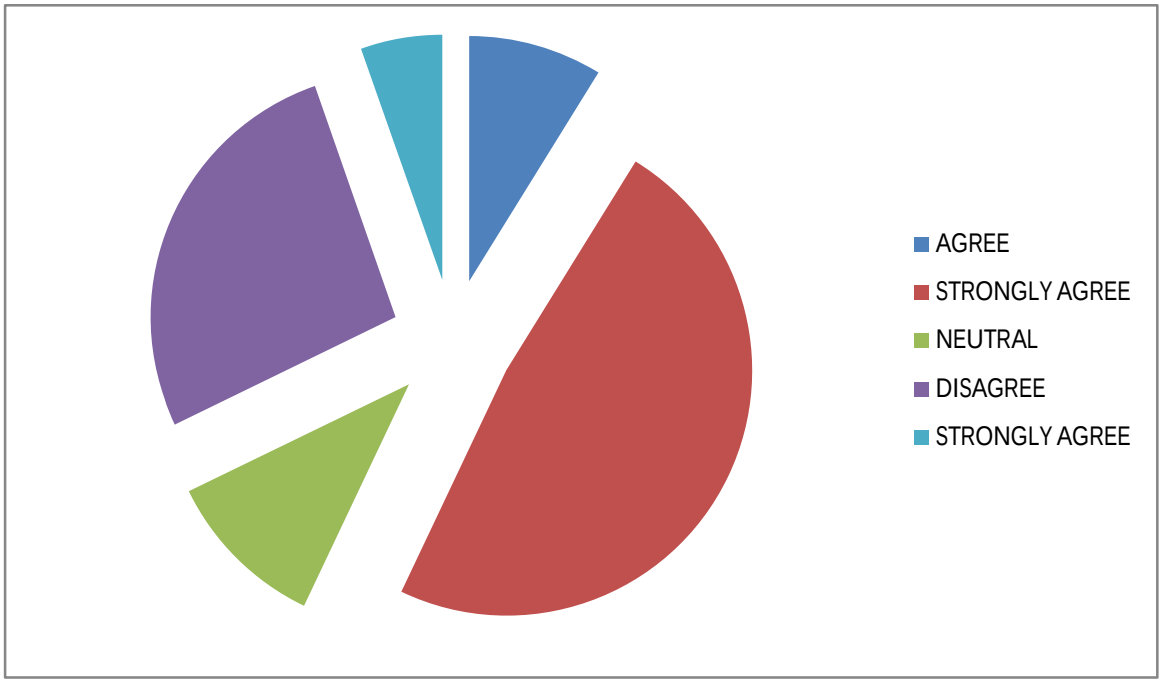


Figure08: student's opinions about the use of pomodoro technique as a method in improving student's memory.

The results points out that (45%) of respondents have strongly agreed on using/applying the pomodoro technique as a method of improving memory, followed by (15%) who have also gave the green light to it, However (10%) weren't neither for nor against it, while (25%) have disagreed upon the utilization of the pomodoro technique in retaining

information easily and quickly, and the last (5%) who strongly disagreed upon adopting it as a memory facilitator.

Q09: Do you find any difficulties in recalling information whenever you need them?

Options	numbers	percentages
Yes	36	90%
No	04	10%
total	40	100%

TABLE09: the difficulties that students face during recalling information.

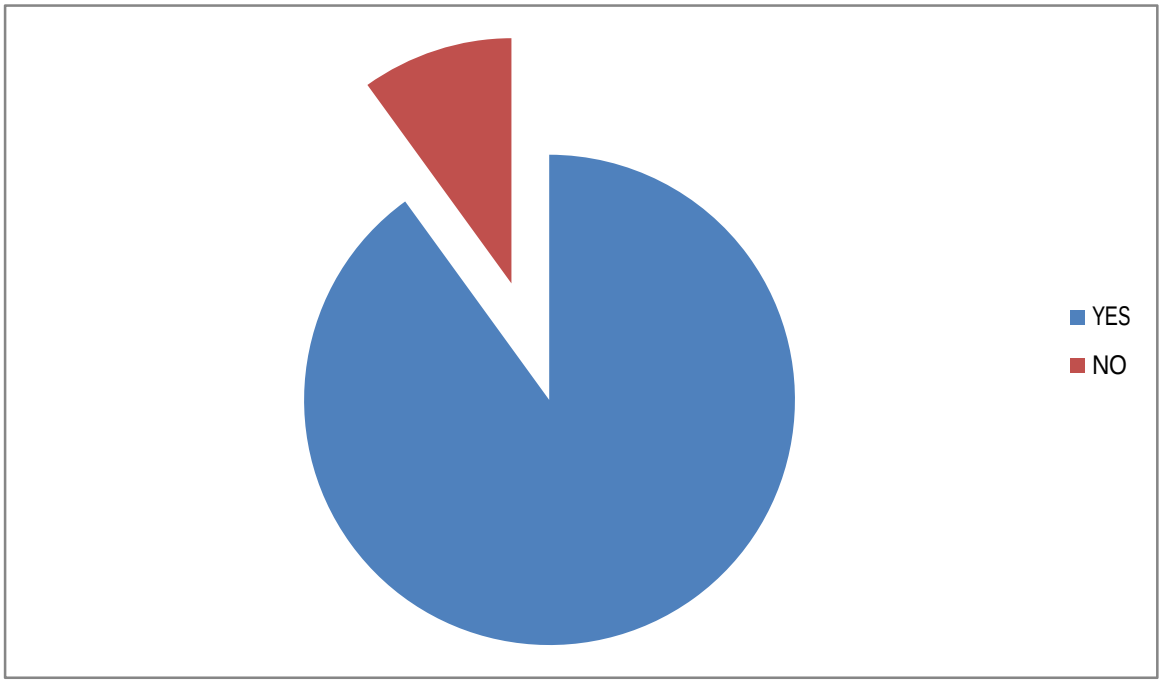


FIGURE09: The difficulties that students face during recalling information.

According to the results mentioned in the table and chart above we could say that the vast majority of students (90%) are facing difficulties during recalling information due to many known factors , however (10%) of the respondents claimed that they do not struggle in retrieving or recalling information.

According to the students who chose yes option, their answers were be like : I think I have amnesia , I struggle from sleeping deprivation and insomnia, and others claimed to have anxiety and dysfunction in their working memory ; all these answers are an obvious sign of having a problem when trying to recall information.

Q10: Do you think student's memory can be developed?

Options	numbers	Percentages
Yes	25	62,5%
no	15	37,5%
total	40	100%

TABLE10: student's opinion about if their memory can be developed.

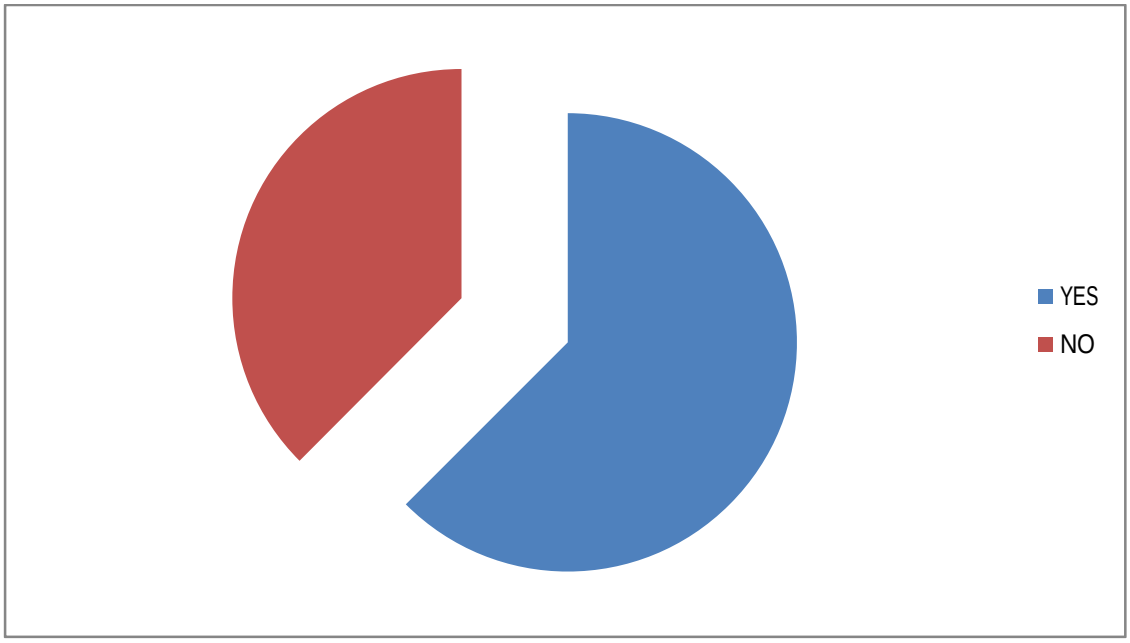


FIGURE10: student's opinion about if their memory can be developed.

As it appears in the table and figure above (62,5%) of informants assume that students memory can be developed which shows that they are quiet aware of their memory and how it functions however (37%) of them answered that students memory cannot be developed and stays as it is .

Students who have answered (YES) had a similar replies to the question (how can they develop their memory); they all said that memory can be developed throughout using different techniques.

Q11: Do you easily memorize information?

Options	Numbers	percentages
Yes	03	7,5%
No	37	92,5%
total	40	100%

TABLE11: student's opinions about their memorization.

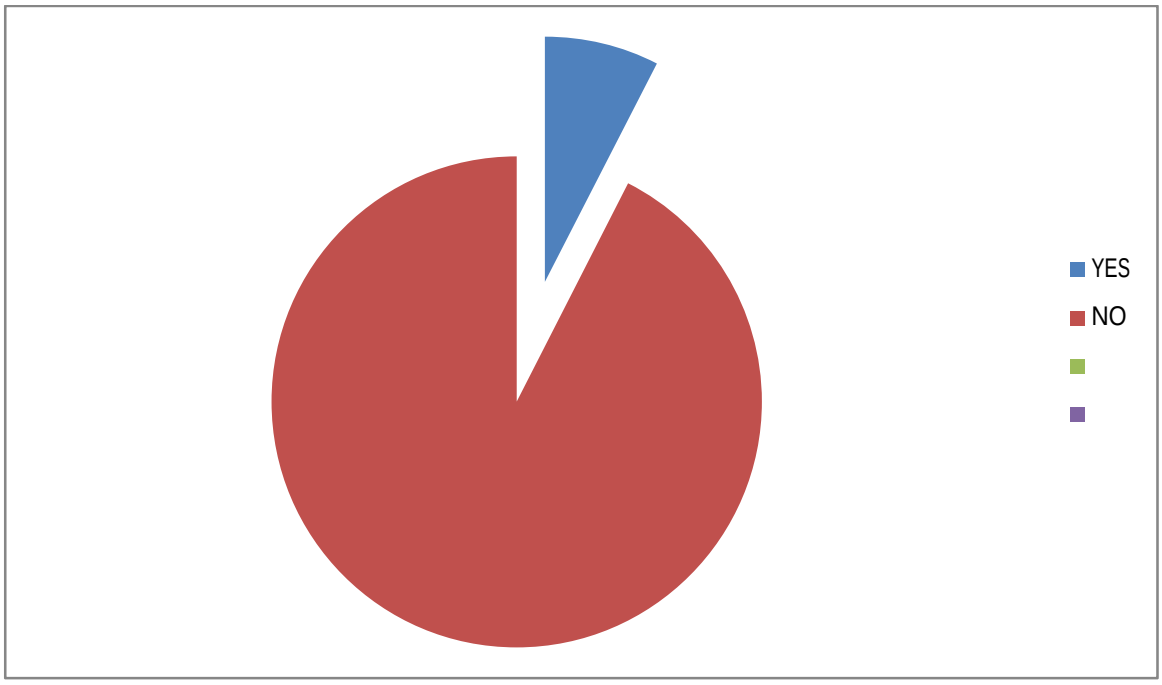


FIGURE11: student's opinions about their memorization

According to the statistic in the table and chart above, the majority of the students (92,5%) stated that it was difficult for them to memorize information, However the rest of the informants (7,5%) claimed that they don't face any problems during memorization .

Q12: Do you think you can train your memory?

Options	Numbers	Percentages
Yes	26	65%
No	14	35%
total	40	100%

TABLE12: student's beliefs about memory training

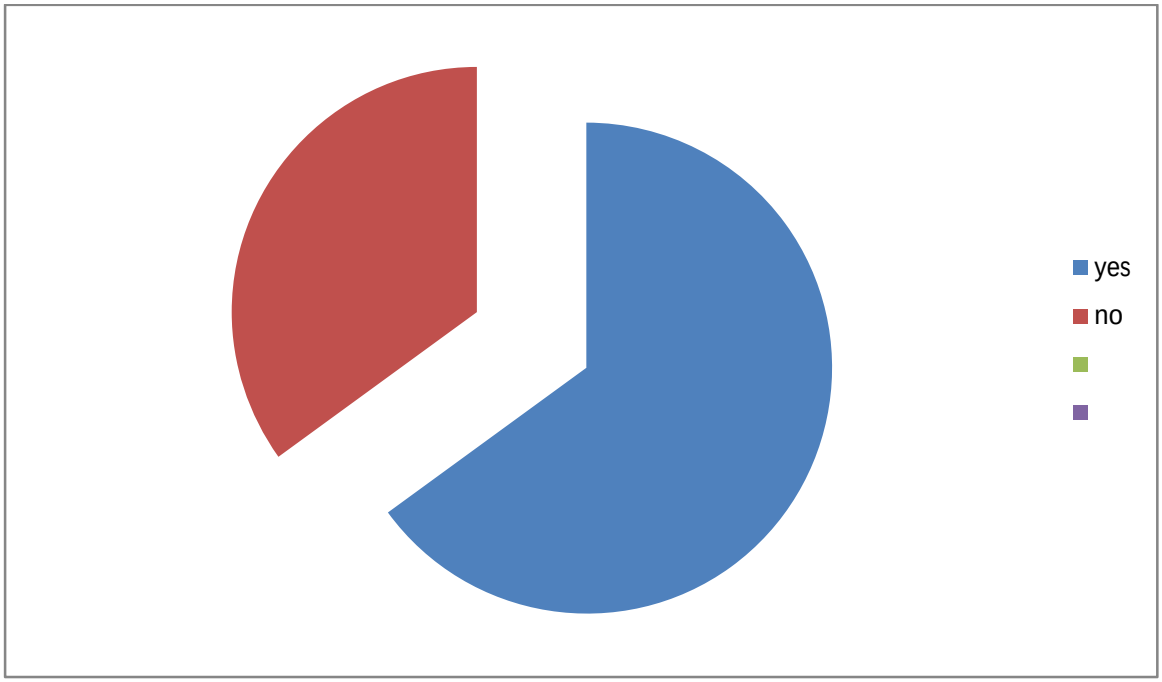


FIGURE12: Student's beliefs about memory training.

The statistics of the table and chart above shows that more than half of the students (65%) claim that they can train their memory in order to develop their memorization skills while (35%) of our informants thinks that memory cannot be trained due to many factors .

If yes , what's the most efficient way / method to train your memory ?

options	numbers	Percentages
Using-techniques (pomodoro)	10	25%
Eating healthy food	13	32,5%
Meditation	3	7,5%
Training your brain	14	35%
total	40	100%

TABLE13: Efficient methods that helps training student's memory.

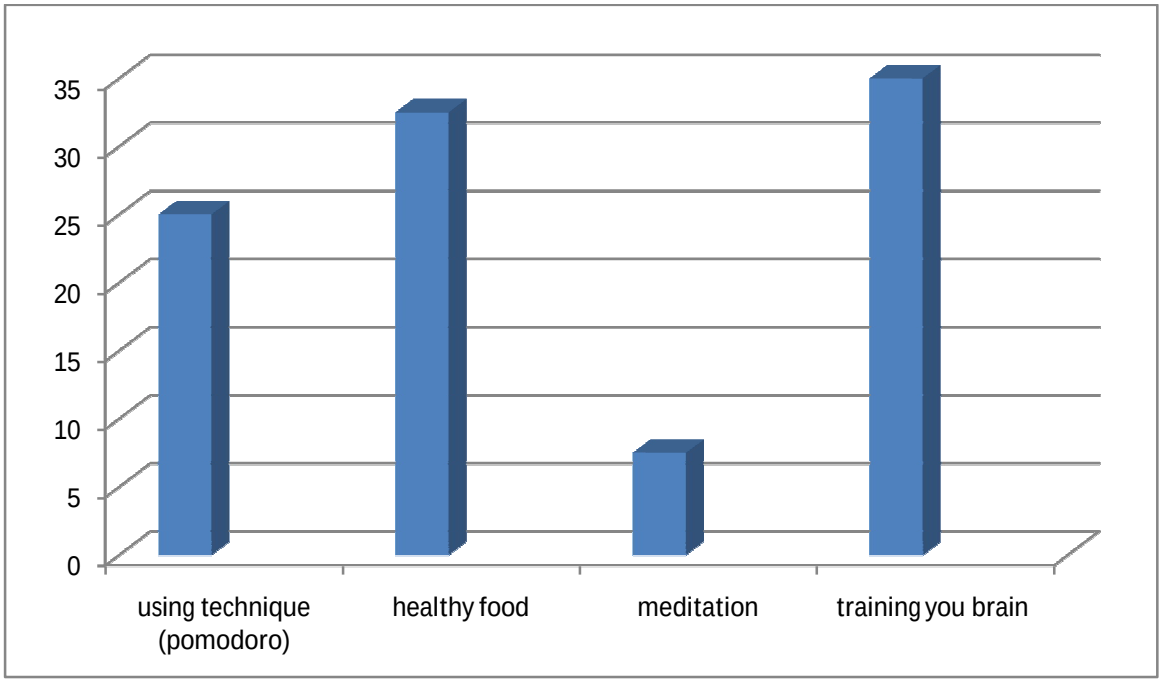


FIGURE13: efficient methods that helps training student's memory.

The bars above shows the results of our informants which provided a variety of answers; to start with the majority of the students (35%) opted for training their brains for specific reasons, while (32,5%) choose option(B, eating healthy food) , and we can notice that a decent percent of students (25%) picked using techniques such as the pomodoro technique in order to train and develop their memory and the last (5%) opted for mediation.

Q13: Do you prefer having breaks between sessions?

options	numbers	Percentages
Yes	27	67,5%
No	04	10%
Sometimes	09	22,5%
total	40	100%

TABLE14: student's perceptions about having breaks between sessions.

FIGURE14: student's perceptions about having breaks between sessions.

The statistic related to this question demonstrate that approximately the majority of students (67,5%) prefer having breaks between sessions , while (10%) of them react negatively toward this option , and the last (22,5%) of the students opted for option (C, sometimes)which means that they rarely takes breaks during memorization.

IF YES WHY!

Those who said yes provided different explanations and arguments such as : to chill out and drink coffee , to relax , to listen to music , to regain energy,for better acquisition, …ECT

Q14: During recalling information , do you feel :

a) **Anxious**
b) **frustrated**
c) **stressed**
d) **all of this**

options	numbers	percentages
Anxious	**05**	**12,5%**
Frustrated	**12**	**30%**
Stressed	**07**	**17,5%**
All of this	**16**	**40%**
Total	**40**	**100%**

TABLE15: student's feelings during recalling information.

FIGURE115: student's feelings during recalling information.

As the bars and table indicates the highest percentages of students (40%) feel anxious , frustrated, and stressed all together during recalling information, while frustration took the second place of rating(30%) However (17,5%)of our informants opted for stressed option and the last (12,5%) choose option (A, anxious)

Q15: To what extent do you AGREE /DISAGREE with the expression «I have very good / bad memory"?

OPTION	NUMBERS	PERCENTAGES
AGREE	20	50%
S.AGREE	10	25%
DISAGREE	08	20%
S.DISAGREE	02	5%
TOTAL	40	100%

TABLE16: students reaction to the expression (I have good/bad memory)

FIGURE16: students reaction to the expression (I have good/bad memory).

The results in the table and chart above indicates that (50%) of students agreed with the expression that says" I have a good/bad memory" ,followed by (25%) who strongly agreed with it , while (20%) of our participants disagreed and only (5%) strongly disagreed with the statement.

Q16: can the brain be strengthened and reshaped just like a muscle?

Options	Numbers	Percentages
Yes	28	70%
No	12	30%
total	40	100%

TABLE17: student's perception about the brain structure.

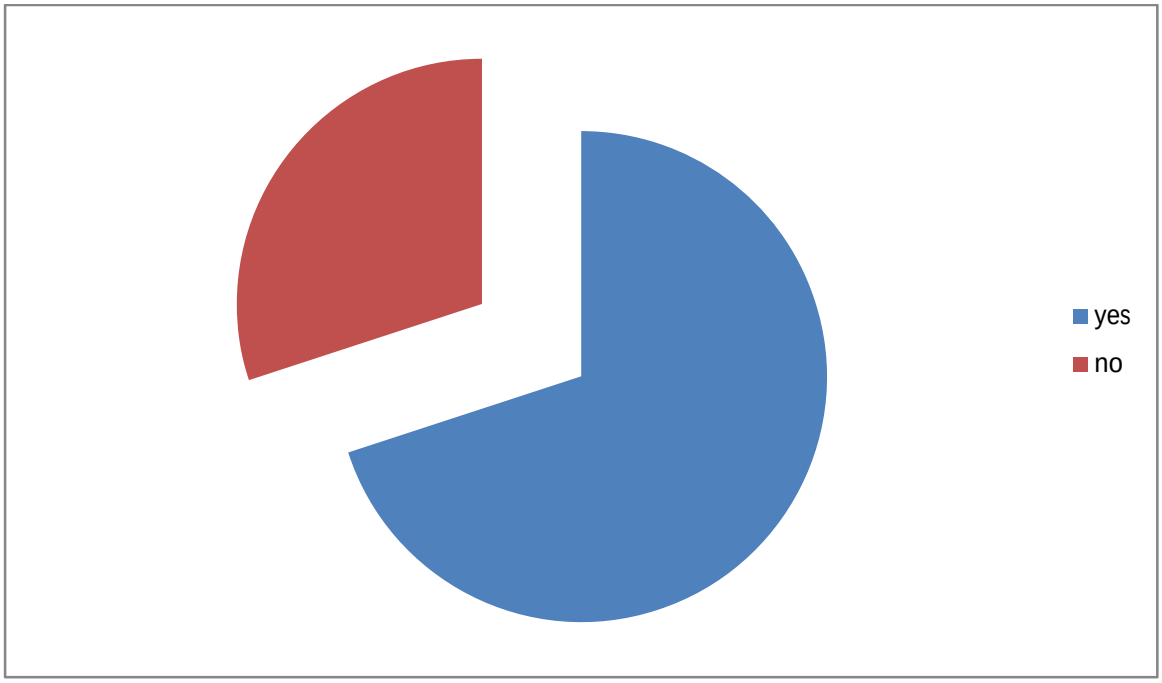


FIGURE17: student's perception about the brain structure.

According to the statistics above (70%) of respondents know that the brain can be strengthened and reshaped just like any other muscle in the human body, However (30%) of them replied with NO.

Q17: Does the brain need freedown time to process new information?

Options	Numbers	Percentages
YES	34	85%
NO	06	15%
TOTAL	40	100%

TABLE18: STUDENTS BELIEFS ABOUT THE BRAIN AND ITS NEED OF FREE DOWN TIME TO PROCESS INFORMATION.

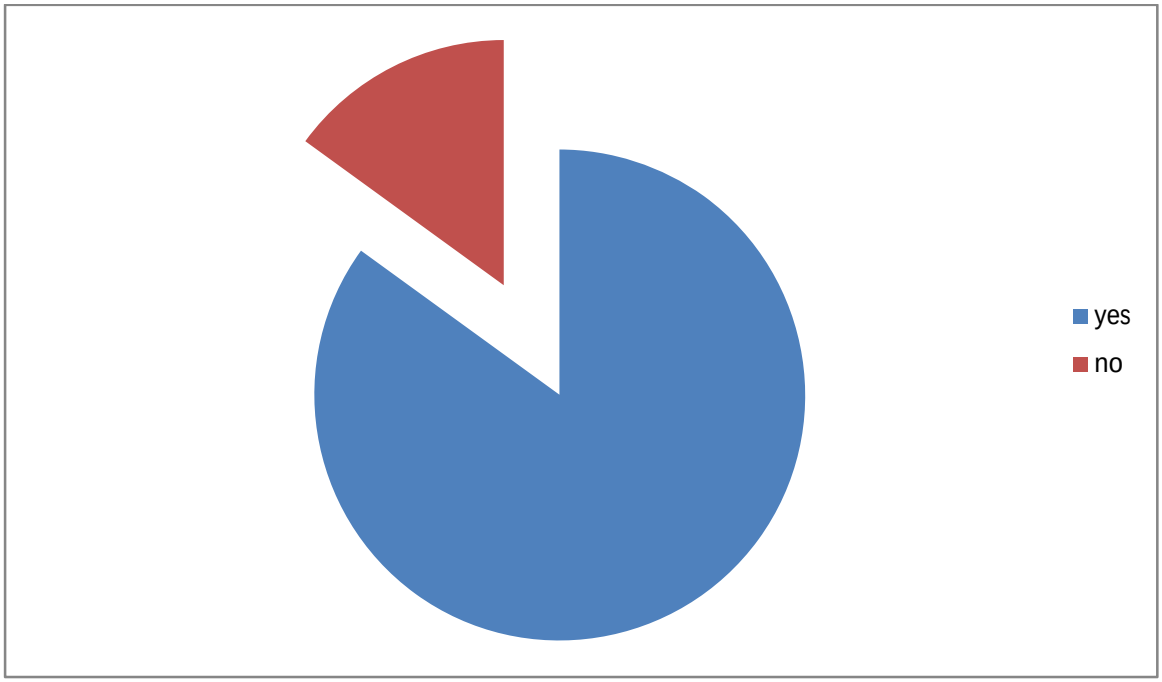


FIGURE18: STUDENTS BELIEFS ABOUT THE BRAIN AND ITS NEED OF FREE DOWN TIME TO PROCESS INFORMATION.

According to the table and chart above , the majority of the students (85%) argued that the brain needs free downtime to process new information , while (15%) of them thinks that the human's brain doesn't need some free downtime in order to process the upcoming information.

Q18: When you are giving information (let's say a new phone number) what strategy do you use in order to keep it in working memory? :

options	numbers	Percentages
Pomodoro technique	14	35%
Repetition	18	45%
Write the information down	08	20%
total	40	100%

TABLE19: student's view about the strategies used in order to keep information in their working memory.

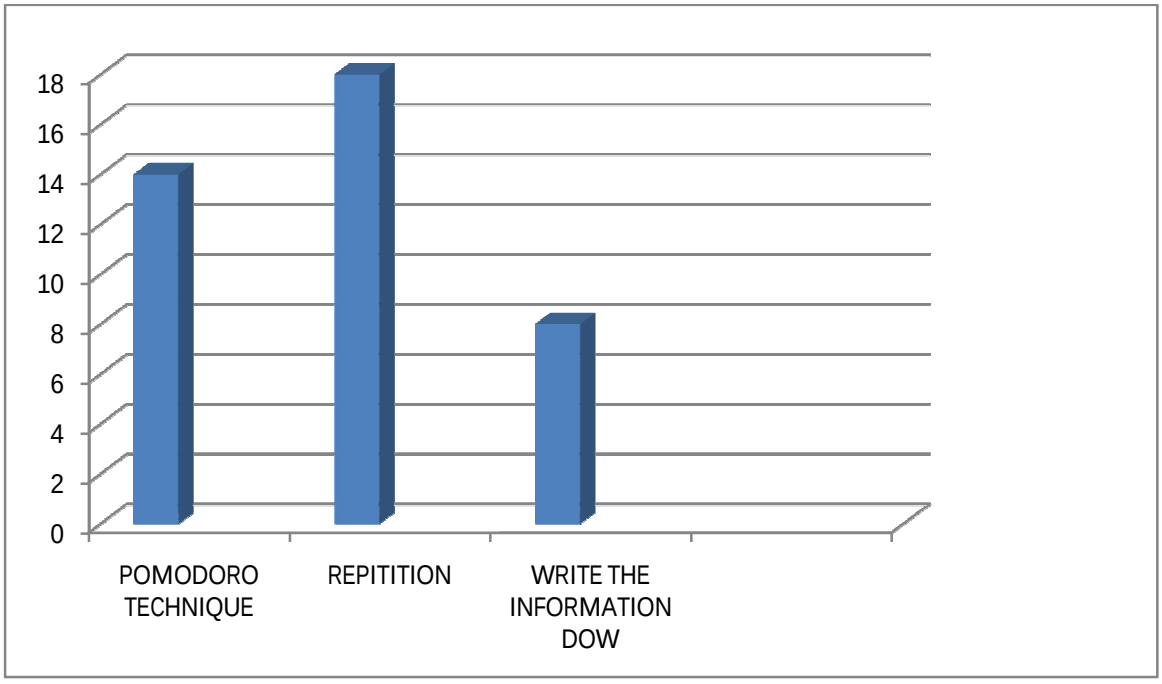


FIGURE19: student's view about the strategies used in order to keep information in their working memory.

The table and bars above indicates that(18) of our participants prefer repetition as a strategy to keep information in their working memory ,while (14) of hem opted for the pomodoro technique, however only eight persons chose to write the information down .

Q19: Which one do you think would be worse having a short term memory deficit or long term memory deficit? WHY ?

options	numbers	Percentages
Short term memory deficit	**19**	**47,5%**
Long term memory deficit	**21**	**52,5%**
total	**40**	**100%**

TABLE20: Student's beliefs about long term/Short term memory deficit.

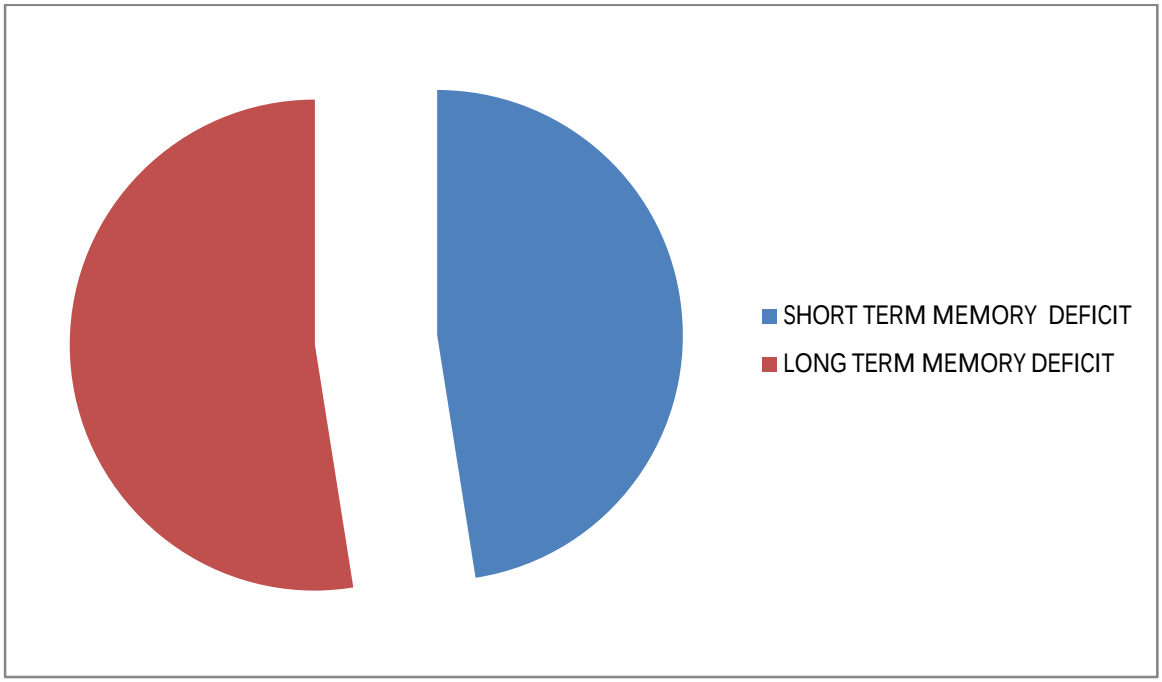


FIGURE20: student's beliefs about long term/Short term memory deficit.

As the statistics above indicates, more than half of students(52,5%) thinks that forgetting something you just heard or saw or did recently is better than having trouble recalling information when you need them , while (47,5%) of the students believe that having a short term memory deficit is worst than a long term memory lose .

Why?

The twenty- one students(21) , who said that having a long term memory deficit is worse gave various reasons such as : their memory starts to get weaker as they get older, it can also be a sign of some serious diseases like Alzheimer's , it causes stress , it causes mental health problems,…ECT

The nineteen students , who said that having a short term memory lose is worse also gave various reasons like : forgetting where you just put something , forgetting recent events , forgetting something you saw or read recently , you start feeling emotionally ,you cant even do basic math and spelling …..ECT

Q20: Do you think that taking a break and reflecting what you have learned in the past can actually help you learn something in the future ? if yes why !

OPTIONS	NUMBERS	PERCENTAGES
YES	25	62,5%
NO	15	37,5%
TOTAL	40	100%

TABLE 21: the effect of taking breaks and the information that you have learned in the past on your future learning .

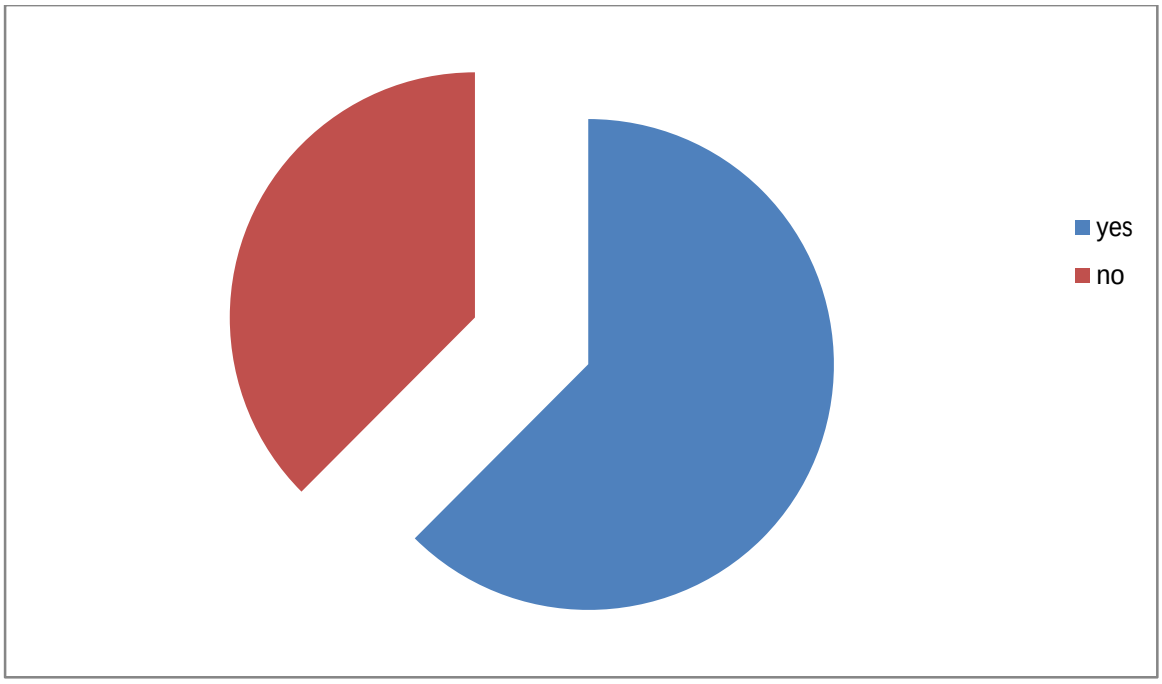


FIGURE21: the effect of taking breaks and the information that you have learned in the past on your future learning.

The statistics above show that 62,5% of the informants agreed with the idea of taking a break and that what you have learned in the past can actually helps in learning something new in the future , However 37,5% of them said no

IF YES, WHY?

Those who said argued that ; their memory performs better under pressure , and that it refreshes their memory , also it makes them more excited , and it helps them learn better…ECT

Interpretation of the Results:

On the basis of the analysis of the student's questionnaire, concluding view may be drawn as follows:

1- Initially, the students questionnaire begins with the students profile
   Gender: Male and Female.
   Age: 20-23, 23-25, 25-30.
   Where was the participation of females aged between 23-25 higher than male's.
   Also where they had given an opportunity to answer some standard and personal questions about their memory state and abilities. Which indicate that the majority of students are not really satisfied with their memory in general and most importantly their memory abilities in specific, in which they feel afraid to forget what they have learned/memorized that results in leading them to assume or truly think that their memory is worse than people their age.
2- The respondent's memory state/ functioning is not that good due to many reasons and factors.

Secondly, in section two which consists of 16 question; was basically about the pomodoro technique and memory.

The main focus was shedding a light on the pomodoro technique and its contribution into enhancing and boosting students' memory. Therefore, to promote or foster the development of one's memory or student's memory, first they should be subjected to some memory tests and questions to see the real level / ability of their memory, if any problem occurred during the process, here memory techniques must be prescribed and served to help them succeed the memorization process.

However, in our case the majority of the respondents are not pleased with their memory abilities and as it is aforementioned above, memory techniques should get involved in order to save the situation and help students to easily memorize and recall information whenever they need.

So, when we asked students their opinions about supporting and using memory techniques as way to facilitate memorization almost all of them got approved/ approbated using them.

The suggested technique where the study was all about is the pomodoro technique which is again a technique that helps enhancing and improving memorization, was familiarized by half of our informants which is not the case but what it can provide the students through their memorization / study process …etc.

The technique was favored by a decent number of students which they surely used it and helped them in improving their memory due its efficiency and practicality and time breaks that it provides, whom they agreed with the idea of using/ applying the pomodoro technique as a method of improving memory/ retention process.

3- In addition, to dive in depths of this study interpretation, when students asked whether they easily memorize and recall information in time of need, most of them showed a sign of struggle and difficulty during what is called by "memorizing and recalling "process which proves that their memory isn't working as it should be and as they expected it to function because we live in times where our memory should be strong and functions for our own- good and self-interest and to be so, memory techniques are the best companion to do its task and pave the way for a good memory.

4- Moreover, as it is cited before, the pomodoro technique was chosen as the best memory technique to land students a hand of help throughout their studies and it was chosen by students themselves especially those who experienced it and utilized it which clearly validates its efficiency and usefulness.

5- Besides that, those who chose using the pomodoro technique are those who said that our memory can be developed/ trained and the brain can be reshaped /strengthened just like a muscle and to further on that , our respondents support using memory improvement techniques due to their immense help , they also believe that if someone's memory is weak it can be enhanced and fixed through memory activities /drills and techniques so that it performs better than it used to , simply by just knowing how the memory or the brain in general functions and act accordingly.

6- It seemed that the majority of students agreed upon having time breaks between study sessions , in other words the brain needs free down- time to process information and that's exactly how the pomodoro technique works , in which they can take break to rest their minds, chill out and having some juice drink or coffee , listening to music or

meditating …etc. and when we wanted to figure out why did they rather having breaks between study sessions they simply replied with varied answers like: to regain energy and start studying or working again, it gives them the feeling of excitement and determination to continue what they have started and it prevents them from forgetting what they studied or revised and not tiring the mind

7- Furthermore, The majority of students argued that they feel different unpleasant feelings during recalling information like anxiety, stress, frustration and so on, due to different reasons, hence the pomodoro technique works on preventing any student to feel so and sharpen/foster their memory skills and abilities it also prepares them to be quiet ready to sit in for an exam, to do a speech, presentation or to recall information when it is really needed.

8- As well, the main focus of the pomodoro technique is to get rid of internal and external distractions which causes other problems such procrastination, lack of attention, forgetfulness and hinders information to get transmitted from short term memory to long term memory , More than half of students preferred having short term memory deficit which means forgetting recent things that it's a normal part of getting older for many people but in our case study most of students who did respond to our questionnaire are aged between 20 -30 which means they still young and fresh. So to stop this problem from getting worse it should be diagnosed and be treated appropriately and one of the key treatments and solution to this problem is applying memory technique such as "the pomodoro technique" when it comes to memorizing an information, speech, a presentation, or revising a lesson because it helps keeping what a student have learned in the working memory then it reinforces it to transfer to a relatively lasting memory. This is why repeating information over and over while you are studying leads to a better recall on exam.

Conclusion:

To summarize, the results obtained from this piece of research prove the positive effects, as well as the significance of the pomodoro technique upon student's memory, which in turn affirm the stated hypothesis. These mostly clarify the existed relationship between the pomodoro technique and the students memory; The obtained results would help us in providing a list of recommendations to students in order to increase their awareness about implementing the pomodoro technique in order to develop and enhance their memory abilities

Recommendations For Further Research

The current concluded study to shed the light on the contribution of the "Pomodoro Technique" into enhancing and boosting the student's memory. The outcomes gained from this research have powerfully proved that student's memory can be extremely enhanced through the implementation of pomodoro technique the truth that confirms it is very significant, which validates the present research hypothesis, from these findings, some recommendations can be set down:

1- Students require taking into consideration the significance of using "The pomodoro technique" in their learning/ study process, since it fosters memory that is the first lead to maintain a good memorization, then later to a better recalling.
2- Teachers also can take advantage of the pomodoro technique and its implementation in teaching process, which means teaching just 25 minutes then take a break of 5 minutes, that leads into students focus and attention, helping to grasp the given material or information and getting it sinked into the brain.
3- Students should use the Pomodoro technique in work place / study place or any other place or environment as a significant and valuable tool for better memorization as well for being productive and industrious.
4- Speaking of productivity, The pomodoro technique can be used also as an alternative tool to improve productivity, one's performance on something, making them focused and even smarter, it can help you crank through projects and tasks faster by forcing you to adhere to strict timing.
5- Through The pomodoro technique not only memorization can be enhanced but also time can be managed and distractions can be avoided, it increases accountability, records accomplishments. Hence it makes easy to plan effectively for the future in which students, teachers and workers should take all these advantages into consideration and never take its benefits for granted.

GENERAL CONCLUSION

GENERAL CONCLUSION

The current conducted research highlights the contribution of the pomodoro technique in enhancing /developing the students memory abilities; it is used to prove that our memory can be developed throughout the use of this new efficient technique (pomodoro). The key question was to what extent pomodoro technique usage affects student's memory abilities.

Its known that Student's attention span starts decaying after a couple of minute of memorization, they start losing focus and quickly get bored, simply they stop getting the stimuli from the environment ; This is when the pomodoro technique comes in. It's a useful technique that facilitates student's memorization and has an influence upon memory and its complex functions; The present work consists of four chapters ,where the first three chapters are the theoretical part which are purely descriptive, whereas the forth chapter was concerned with the practical part through administrating questionnaires to master two students of English at the university Abbes Laghrour khenchela. The first chapter then, aims at presenting memory as an important part of human beings that can affect our memorization, The second chapter present data and facts about the pomodoro technique, then the Third chapter which examine the existed relationship between the first two chapters. However, the forth chapter deals with the analysis and interpretation and the data gathered from students and teachers questionnaires.

On the light of these findings ,the heart of this entire work can be explained in the following two main points : (1) students needs to be aware about how does their memory work in order to develop it ,(2) students needs to understand the fact that they need memory techniques in their lives to facilitates the process of recalling information.

It can be concluded that the use of the pomodoro technique has a major influence up on students memory, and it can be seen as one of the most affective mnemonic techniques .

Bibliography

Bibliography :

Chapter one :.

Sites

https://www.youtube.com/watch?v=ZU4suR_uXbg.

http://www.skepdic.com/memory.html.

(*http://www.amazon.com/exec/obidos/ISBN=0673467899/roberttoddcarrolA/*.

(http://www.amazon.com/exec/obidos/ISBN=0205279481/roberttoddcarrolA/.

http://thebrain.mcgill.ca/.

http://thebrain.mcgill.ca/flash/a/a_07/a_07_cr/a_07_cr_tra/a_07_cr_tra.html.

ARTICLES/BOOKS :

Christianson, 1992. "Relative brain size and metabolism in mammals". *Science*. **220** (4603): 1302–1304. Bibcode:1983Sci...220.1302A.

Clark, Zola, & Squire,(2000) "Retrieval and reconsolidation: toward a neurobiology of remembering". *Learning and Memory*. **7** (2): 73–84. doi:10.1101/lm.7.2.73. PMID 10753974.

Clark, Zola, & Squire *(1944). The measurement of adult intelligence. Baltimore: Williams & Wilkins. ISBN 978-0-19-502296-4. OCLC 219871557.* ASIN = B000UG9J7E.

Collins Dictionary of Medicine (2009). *Language, memory, and though*. Hillsdale, NJ: L. Erlbaum Associates. ISBN 978-0-470-15187-7. OCLC 2331424 .

expert Karl Lashley (1950). "Organization and memory". In K.W. Spence & J.T. Spence (Eds.), The psychology of learning and motivation: Advances in research and theory. Vol. 1, pp. 328–372. New York: Academic Press.

Josselyn,(2010). *The social psychology of experience: Studies in remembering and forgetting*. London: Sage.

Judith Hooper and Dick(1986). . Memory science, memory politics. In P. Antze & M. Lambek (Eds.), *Tense past: Cultural essays in trauma and memory* (pp. 67–87). New York & London: Routledge.

Kyllonen and Christal (1995) . *Handbook of Intelligence: Evolutionary Theory, Historical Perspective, and Current Concepts*. New York, Heidelberg, Dordrecht, London: Springer. p. 3. ISBN 978-1-4939-1561-3.

Myhrer, 2003. *Human anatomy* (3rd Ed.). McGraw-Hill. p. 416. ISBN 978-0-07-122207-5.

Bibliography

Pogue Press/O'Reilly, (2008) . "The Cognitive Neuroscience of Human Memory Since H.M." *Annual Review of Neuroscience*. Annual Reviews. **34** (1): 259–288. doi:10.1146/annurev-neuro-061010-113720. ISSN 0147-006X. PMC 3192650. PMID 21456960.

Robert (1998) Science of Memory: Concepts. New York: Oxford University Press, pp. 171–175.

Robinson,(2008). *Remembering the times of our lives: memory in infancy and beyond*. Hillsdale, NJ: Lawrence Erlbaum Associates. ISBN 978-0-8058-5733-7. OCLC 62089961.

Roediger & McDermott, (2000). *The Stanford Encyclopedia of Philosophy*. Retrieved 2011-10-14.

Simon & Schuster, (1982) .*Cognitive psychology: Connecting mind, research and everyday experience*. Nelson Education.

ScienceDaily, 17 May 2016). "A process analysis of the CA3 subregion of the hippocampus". *Front Cell Neurosci*. **7**: 78.

Steinmetz, 1999; Green & Woodruff-Pak,(2000). "Learning under stress impairs memory formation". *Neurobiology of Learning and Memory*. **93** (2): 183–188. doi:10.1016/j.nlm.2009.09.009. PMID 19796703. S2CID 38765943.

Sussanne jeaggi (2008). "Intelligence: Knowns and unknowns" (PDF). *American Psychologist*. **51** (2): 77–101. doi:10.1037/0003-066x.51.2.77. ISSN 0003-066X. Archived (PDF) from the original on 28 March 2016. Retrieved 9 October 2014.

the Spanish Royal Academy (2004). "Memory reconsolidation: an update". *Annals of the New York Academy of Sciences*. **1191** (1): 27–41. Bibcode:2010NYASA1191...27N. doi:10.1111/j.1749-6632.2010.05443.x. ISSN 0077-8923. PMID 20392274.

Chapter two :

SITES :

https://francescocirillo.com/pages/francesco-cirillo .

https://en.wikipedia.org/wiki/Pomodoro_Technique.

https://lif ehacker.com/productivity-101-a-primer-to-the-pomodoro-technique-1598992730.

books:

For Francesco Cirillo (2006).Book:"pomodoro technique".

Chapter three:

Alberts, Bruce. New York: Garland Science, 2002. *Language, memory, and though*. Hillsdale, NJ: L. Erlbaum Associates. ISBN 978-0-470-15187-7. OCLC 2331424.

Barbara Oakley's words(2006). . *Memory observed: remembering in natural contexts*. San Francisco: W.H. Freeman. ISBN 978-0-7167-1372-2. OCLC 7837605.

Bibliography

Broccoli V, Simeone A Molecular Biology of the Cell. New York: Garland Science(2008).

David Eagleman (2004).Book: « the brain ,the story of you .

David J. Piekarski (January 2017). "Loss of Recent Memory After Bilateral Hippocampal Lesions". *Journal of Neurology, Neurosurgery, and Psychiatry*. **20** (1): 11–21.

.Norman Doidge, M.D.(2009) ."Age differences in memory for item and source information". *Canadian Journal of Psychology*. **41** (2): 175–192.

Stuart and Rutherford (1978). . "Stress disrupts context-dependent memory". *Learning and Memory*. **16** (2): 110–113. doi:10.1101/lm.1257509. PMID 19181616.

Appendix

Dear colleagues,

We are not computers and we cannot recall information whenever we want, and it never works quiet like we wish it would, so we tend to hack our memory with tools and techniques that aims to facilitate the process of memorizing things and recall them whenever we need ; this questionnaire ,entitled : the contribution of the pomodoro technique into facilitating and improving the students memory aims to make students aware/recognize the pomodoro technique and the importance of setting a timer and taking a 5 minutes breaks every 25 minutes in improving our memory , the pomodoro memory technique has been designed to help students memorize easily and to avoid the lack of concentration and forgetfulness, and to build a better brain because any one can reshape their brains .

We would be grateful if you could answer the following questions, your answer will be a great help for us to reach the targeted objective of our inquiry, please tick the appropriate box or give full statement when necessary.

Thank you in advance, for your cooperation and time consecration.

- **Gender :**

Female ☐ **male** ☐

- **Age :**

20-23 ☐ **23-25** ☐ **25-3**☐

- **Are you generally pleased with your memory?**

YES ☐ **NO** ☐ **MAYBE** ☐ **UNDECIDED** ☐

- **Is your memory worst than other people at your age?**

YES ☐ **NO** ☐ **MAYBE** ☐ **UNDECIDED** ☐

- **Are you worried that you will forget something important?**

YES ☐ **NO** ☐ **MAYBE** ☐ **UNDECIDED** ☐

- **Are you worried about your memory abilities?**

YES ☐ **NO** ☐ **MAYBE** ☐ **UNDECIDED** ☐

2) Do you support using memory techniques?

YES ☐ **NO** ☐

3) Are you familiar with the pomodoro technique?

YES ☐ **NO** ☐

If yes can you tell us how it helped you improving your memory?

……

……

……

……

……

…….

3)-How do you react to this statement: "we are all born equal in IQ"?

Agree ☐ **strongly agree** ☐ **disagree** ☐ **strongly disagree** ☐

4) -To which extent do you agree or disagree with the idea of using / applying the pomodoro Technique as a method of improving memory / retention process?

AGREE ☐ **STRONGLY AGREE** ☐ **NEUTRAL** ☐ **DISAGREE** ☐ **STRONGLY DISAGREE** ☐

5) -Do you find any difficulties in recalling information whenever you need them?

YES ☐ **NO** ☐

If yes, explain why?

……

……

……

……

……..

7) - Do you think student's memory can be developed?

YES ☐ **NO** ☐

If yes how?

……

……

……

……..

8)-Do you easily memorize information?

YES ☐ **NO** ☐

9)-Do you think you can train your memory?

YES ☐ **NO** ☐

If yes, what are the most efficient way / method to train your memory?

- **Using techniques(pomodoro)** ☐
- **Eat healthy food** ☐
- **Meditation** ☐
- **Train your brain** ☐

6) -Do you prefer having breaks between sessions?

YES ☐ **NO** ☐ **SOMETIMES** ☐

If yes, explain why?

……

……

7) **-During recalling information , do you feel :**

Anxious ☐ **frustrated** ☐ **stressed** ☐ **all of this** ☐

8) **-To what extent do you AGREE /DISAGREE with the expression " I have very good / bad memory "**

AGREE **STRONGLY AGREE** ☐ **DISAGREE** ☐ **STRONGLY DISAGREE** ☐

9) **-Can the brain be strengthened and reshaped just like a muscle?**

YES ☐ **NO** ☐

10) **-Does the brain need freedown time to process new information?**

YES ☐ **NO** ☐

11) **- When you are giving information (let's say a new phone number) what strategy do you use order to keep it in working memory? :**

- **Pomodoro technique** ☐
- **Repetition** ☐
- **Write the information down** ☐

12) -Which one do you think would be worse having a short term memory deficit or long term memory deficit? WHY?

……

……

……

……

13) - Do you think that taking a break and reflecting what you have learned in the past can actually help you learn something in the future?

YES ☐ **NO** ☐

IF YES, WHY?

……
……
……
……..

Thanks for your cooperation

Abstract

The purpose of the present study is to demonstrate how does the pomodoro technique take part in enhancing the memory of master two student's at the English department of Khenchela university , it aims at determine whether the students' memory abilities could be improved by using this efficient technique.

To carry out this study. we have used the descriptive (quantitative) method as an appropriate way for investigating the effects of the pomodoro technique upon students memory, one questionnaire was used for master two students to get a credible and transparent answers that will be eventually interpreted into results .

The results have shown that ,the POMODORO technique plays a major role in enhancing students memory and it is considered to be the most appropriate strategy that the students can use in order to facilitate the process of memorizing information and recall them wenever they need.

Résumé :

Le but de cette étude est de démontrer comment la technique pomodoro prendre part à l'amélioration de la mémoire des étudiants de master deux au département d'anglais de l'université de Khenchela, il vise à déterminer si les capacités de mémoire des étudiants pourraient être améliorées en utilisant cette technique efficace.

Pour mener à bien cette étude. nous avons utilisé la méthode descriptive (quantitative) comme un moyen approprié pour étudier les effets de la technique pomodoro sur la mémoire des étudiants, un questionnaire a été utilisé pour les étudiants master deux pour obtenir une réponse crédible et transparente qui sera éventuellement interprété en résultats .

Les résultats ont montré que la technique POMODORO joue un rôle majeur dans l'amélioration de la mémoire des élèves et qu'elle est considérée comme la stratégie la plus appropriée que les élèves peuvent utiliser afin de faciliter le processus de mémorisation de l'information et de les rappeler quand ils en ont besoin.

ملخص:

الغرض من هذه الدراسة هو توضيح كيفية مساهمة تقنية بومودورو في تعزيز ذاكرة الطالبين الرئيسيين في قسم اللغة الإنجليزية بجامعة خنشلة ، وتهدف إلى تحديد إذا كان يمكن تحسين قدرات الذاكرة لدى الطلاب باستخدام هذه التقنية الفعالة .

لإجراء هذه الدراسة. لقد استخدمنا الطريقة الوصفية (الكمية) كطريقة مناسبة للتحقيق في تأثيرات تقنية بومودورو على ذاكرة الطلاب ، وقد تم استخدام استبيان واحد للحصول على إجابات موثوقة وشفافة سيتم تفسيرها في النهاية إلى نتائج.

أظهرت النتائج أن تقنية بومودورو تلعب دورًا رئيسيًا في تعزيز ذاكرة الطلاب وتعتبر الإستراتيجية الأنسب التي يمكن للطلاب استخدامها من أجل تسهيل عملية حفظ المعلومات واسترجاعها متى احتاجوا إليها.