Chapter - I
Introduction

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CHAPTER - I
INTRODUCTION

1.1. INTRODUCTION

"All improvement in memory consists of one's habitual method of recording facts"

- Dr. William James, Father of American Psychology

Psychology touches almost every aspect of our lives. As society has become progressively more complex, psychology has assumed an increasingly significant role in solving human problems. Psychology is the study of behavior of human beings as well as animals, normal, abnormal, children and adult. Psychology occupies all the fields of study like behavioral, cognitive, affective, psychomotor, developmental, personality, perception, motivation, learning, industrial, Para, attitude, physiological, experimental, social, vocational, clinical, health, military, genetic aspects etc.,

Educational psychology is applied branch of psychology. Educational psychology has influenced the educative processes in many ways. It is an attempt to apply the knowledge of psychology to the field of Education. Memory is the colossal contribution of cognitive psychology which shows different approaches of remembrance and forgetting, Educational Psychology emphasizes on memory, related factors and improving memory of students in Educational process.

1.2. MEMORY

Memory is a crucial psychological factor influencing learning. Learning plays noteworthy role in all the walks of human life. All the finest attempts in the field of the Education are directed to make the student learn properly. For an effective learning it is essential that one should be able to preserve past
experiences and make use of them whenever needed. In The psychological world, this ability of retention and reclaiming is known as memory.

Definitions:

Stout: “Memory is the ideal revival so far as ideal revival is merely reproductive. This productive aspect of ideal revival requires the object of past experiences to be re-instated as far as possible in the order and manner of their original occurrence”

Would Worth and Marquis: “Memory consists in remembering what has previously been learned”.

Ryburn: “The power that we have to ‘store’ our experiences and to bring into the field of consciousness some time after the experiences have occurred in term”

    Memory becomes a special ability of our mind to store what has been previously learnt or experienced to recollect or reproduce it after some time.

MEANING OF MEMORY

In psychology, Memory is an organism’s ability to store, retain, and recall information and experiences. Traditional studies of memory began in the fields of philosophy, including techniques of artificially enhancing memory. The late nineteenth and early twentieth century put memory within the paradigms of cognitive psychology. In recent decades, it has become one of the principal pillars of a branch of science called cognitive neuroscience, an interdisciplinary link between cognitive psychology and neuroscience.

Memory becomes an act of remembering. This is a process of encoding, retrieving information. Memory is one of the most indispensable ability that man is endeavored with. Learning is inseparable part of memory. Learning requires Intelligence as well as Memory. Human mind possesses a special ability by virtue
of which every experience or learning lives behind memory images or traces which are conserved in the form of 'engrams' composed of memory traces. This preservation of the memory traces by our central nervous system or brain is known as retaining of the learnt or experienced act. How long we can retain depends upon the strength and quality of the memory traces.

**PROCESSES OF MEMORY**

Human memory is not a single "vessel" to be filled, but rather a complex set of interrelated memory systems. From information processing perspective there are three main stages in the formation and retrieval of memory.

**Encoding**

Once something is attended to, it must be encoded to be remembered. Basically, encoding refers to translating incoming information into a mental representation that can be stored in memory. Someone can encode the same information in a number of different ways. For example, one can encode information according to its sound (acoustic code), what it looks like (visual code), or what it means (semantic code). Suppose, for example, that trying to remember these three types of encoding from the notes, might say each of the terms aloud and encode the sounds of the words (acoustic), might see the three types of encoding on the page and visualize the way the words look (visual), or might think about the meanings of each of the terms (semantic).

One may be able to remember information best if use techniques (while retrieving the information) that are related to the encoding. For example, if encoded something visually, it will be able to recall most easily by drawing on visual cues.
Storage

Storage is the process of holding information in memory. A distinction is often made between short-term and long-term memory. Short-term memory is just that, brief and transient. Think about looking up a new phone number in the phone book and making a call. May remember it long enough to make the call, but do not recall it later. This is short-term memory, which can hold a small amount of information for a short period of time. Once if stop attending to the number, perhaps after make the call and move on to another task, are likely to forget it. In order to remember the number for a longer period of time (and after attending to other things), it would need to store it in long-term memory.

The transfer of information from short-term to long-term memory can be achieved in numerous ways. Simply repeating the information could help if it's repeated enough times. For example, frequently called phone numbers are remembered because have used (repeated) the number many times. Although simply repeating, or practicing, something can help move it into long-term memory, another strategy for transferring information is to think about it deeply. That is, elaborate on the information, drawing connections between what are trying to remember and the other things with which are already familiar, might learn that telephone number quicker, for example, the dates of friend's birthday, the numbers on your license plate or some other familiar number pattern.

Retrieval

Retrieval is the process of actually remembering something when want to. If think about tip-of-the-tongue experiences, when know a word or name but just can't seem to recall it, will understand how retrieval is different from storage. In terms of memory improvement, it can help to understand how the retrieval process relates to encoding and storage. Consider the relationship between retrieval and encoding. If encoded something visually, but are trying to retrieve it acoustically,
will have difficulty in remembering. Like encoding, information can be retrieved through visualizing it, thinking about the meaning, or imagining the sound, etc. The more ways information has been encoded, the more ways there are for retrieving it. Imagine that you are taking a test in which you are given a definition and asked to recall the word it describes. One may recall the page of notes that the word was on and visualize the word, or might say the definition to oneself and remember repeating the word. Thus, memory is aided by encoding and retrieving information in multiple ways.

Retrieval relates to storage as well, obviously the memory has to be stored in order to retrieve it, but knowing *how* it was stored can help. This is where elaboration and processing come in. When attempting to retrieve information, it helps to think about related ideas. For example, trying to remember a chemistry formula during an exam. Although able to visualize the page of chemistry notes, cannot recall the exact formula. Do remember, however, that this same formula was used in the biology class in last semester. If think about that class, able to recall the formula. This is one reason why intentionally organizing information in memory when learning, it helps recall it later.

**Attention —> Encoding —> Storage —> Retrieval**

Here are the steps of memory discussed thus far. First, you select the information to which you will attend. You then code the information for storage (where it can be practiced and processed more deeply). Later, when needed, information is retrieved by using a search strategy that parallels how the information was coded and stored.
CLASSIFICATION OF MEMORY

While all memory systems are interdependent (and have information going in both directions), the most critical memory system for incorporating knowledge into long-term memory is the short-term or "working memory." All incoming information is organized and processed in the working memory by interaction with knowledge in long-term memory. The limiting feature here is that working memory can process only a relatively small number (five to nine) of psychological units at any one moment. This means that relationships among two or three concepts are about the limit of working memory processing capacity. Therefore, to structure large bodies of knowledge requires an orderly sequence of iterations between working memory and long-term memory as new knowledge is being received.

All the information that is register into sensory memory not necessarily entered or palled to short term memory or LTM unless it is processed. The information processing occurs in three stages. The figure 1 and the flow chart 1 illustrate these three stages.

Figure 1. The Three Memory Systems of the Human Mind
Atkinson-Schifrin Model

MULTI-STORE MODEL

Sensory Memory

The sensory memories perform as buffers for stimuli received through the senses. The term sensory memory is used to describe the state when the sensory registers receive incoming information and hold them for enough time to be processed. All the information enters into sensory memory by sense organs. Visual memory retain within a fraction of second. Auditory memory for 2 to 4 seconds will be retained. The object which concentrated attended and recognized will be retained and sends to STM. In the sense, information is passed from sensory memory into short-term memory by attention, thereby filtering the stimuli to only those which are of interest at a given time.

Short-term Memory

Short-term memory acts as a scratch-pad for temporary recall of the information under process. For instance, in order to understand the sentence need to hold in mind the beginning of the sentence read the rest. Short term memory decays rapidly and also has a limited capacity. It holds 7 to 9 items for 30 seconds. Chunking of information can lead to an increase in the short term memory capacity. This is the reason why a hyphenated phone number is easier to remember than a single long number. The Successful formation of a chunk is known as closure. Interference often causes disturbance in short-term memory retention.
This accounts for the desire to complete the tasks held in short term memory as soon as possible.

**Long-term Memory**

The information that is attended, repeated rehearsal and associating, practiced memory techniques and meaningful organization of information will enter to LTM. LTM holds tremendous amount of information, it has enormous capacity, highly organized. Hence the information once entered into long-term memory can be retrieved anytime. Whatever the information that has been stored at LTM will not undergo forgetting but it may sometime difficult to retrieve.

To understand the three stages of memory clearly the another model presented in the diagram 2.

**Diagram 2. Stages of Memory**
To get more explanation of the above model the few factors were presented below.

<table>
<thead>
<tr>
<th>Sl no</th>
<th>Sensory Memory</th>
<th>Short-Term Memory</th>
<th>Long-Term Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertically exact visual and Auditory stimulus are held as iconic images</td>
<td>Information coded in concise form</td>
<td>Semantic organization, systematic classification, organization is compartmentalized</td>
</tr>
<tr>
<td>2</td>
<td>Hold large amount of auditory and visual stimuli is up to 16 items</td>
<td>Capacity is limited to 7 to 9 items</td>
<td>Unlimited capacity</td>
</tr>
<tr>
<td>3</td>
<td>Duration is very short. Visual-1/10th sec to 1 sec, Auditory-2 sec</td>
<td>Duration of the information which it can hold is upto 30 sec</td>
<td>Duration for a month, a year or life time.</td>
</tr>
<tr>
<td>4</td>
<td>Processes that take place are attention and recognition</td>
<td>Processes that take place are focusing, attention, rehearsal, memory techniques</td>
<td>Information stored in imagery, meaningfulness</td>
</tr>
<tr>
<td>5</td>
<td>Information is deleted because of decay</td>
<td>Because of displaced</td>
<td>Because of faulty organization and non used.</td>
</tr>
</tbody>
</table>

Long-term memory is intended for storage of information over a long period. Depending upon the type of information stored in LTM, it is classified as below.
Anderson divides long-term memory into **declarative (explicit)** and **procedural (implicit)** memories. Declarative memory requires conscious recall, in that some conscious process must call back the information. It is sometimes called **explicit memory**, since it consists of information that is explicitly stored and retrieved.

**Declarative Memory** can be further sub-divided into **semantic memory**, which concerns facts taken independent of context; and episodic memory, which concerns information specific to a particular context, such as a time and place. Semantic memory allows the encoding of abstract knowledge about the world, such as "Paris is the capital of France". Semantic memory, on the other end, is a structured record of facts, concepts and skills that are acquired. The information in semantic memory is derived from that in our own episodic memory, such that we can learn new facts or concepts from our experiences. **Episodic memory**, on the other hand, is used for more personal memories, such as the sensations, emotions, and personal associations of a particular place or time; episodic memory
represents our memory of events and experiences in serialized form. *Autobiographical memory* - memory for particular events within one's own life - is generally viewed as either equivalent to, or a subset of, episodic memory. *Visual memory* is part of memory preserving some characteristics of our senses pertaining to the visual experience. One is able to place in memory information that resembles objects, places, animals or people in sort of a mental image. Visual memory can result in priming and it is assumed some kind of perceptual representational system underlies this phenomenon.

In contrast, *procedural memory (or implicit memory)* is not based on the conscious recall of information, but on implicit learning. Procedural memory is primarily employed in learning motor skills and should be considered a subset of implicit memory. It is revealed when one does better in a given task due only to repetition - no new explicit memories have been formed, but one is unconsciously accessing aspects of those previous experiences. Procedural memory involved in motor learning depends on the functionality of the cerebellum and basal ganglia.

1.3. **THE MEMORY IN BRAIN**

![Figure 3. The Structure of Brain](image)
Figure 4. The Structure of Brain

Figure 5. The Structure of Brain Covered almost all Parts of Memory
The Brief Explanation of Memory in Brain

Short-term memory is supported by transient patterns of neuronal communication, dependent on regions of the frontal lobe (especially dorsolateral prefrontal cortex) and the parietal lobe. Long-term memories, on the other hand, are maintained by more stable and permanent changes in neural connections widely spread throughout the brain. The hippocampus is essential (for learning new information) to the consolidation of information from short-term to long-term memory, although it does not seem to store information itself. Hippocampus, a primitive structure deep in the brain, plays the single largest role in the processing of the information as memory. Without the hippocampus, new memories are unable to be stored into long-term memory, and there will be a very short attention span. Furthermore, it may be involved in changing neural connections for a period of three months or more after the initial learning. One of the primary functions of sleep is thought to be improving consolidation of information, as several studies have demonstrated that memory depends on getting sufficient sleep between training and test. Additionally, data obtained from neuro imaging studies have shown activation patterns in the sleeping brain which mirror those recorded during the learning of tasks from the previous day, suggesting that new memories may be solidified through such rehearsal.

Brain areas involved in the neuroanatomy of memory such as the hippocampus, the amygdala, the striatum, or the mammillary bodies are thought to be involved in specific types of memory. For example, the hippocampus is believed to be involved for spatial learning and declarative learning, while the amygdala is thought to be involved in the emotional memory. The amygdala, an almond-shaped area near the hippocampus, processes emotion and helps imprint memories that involve emotion. Damage to certain areas in patients and animal models and subsequent memory deficits is a primary source of information.
However, rather than implicating a specific area, it could be that damage to adjacent areas, or to a pathway traveling through the area is actually responsible for the observed deficit. Further, it is not sufficient to describe memory, and its counterpart, learning, as solely dependent on specific brain regions. Learning and memory are attributed to changes in the neuronal synapses, thought to be mediated by long-term potentiation and long-term depression.

Hebb distinguished between short-term and long-term memory. He postulated that any memory that stayed in short-term storage for a long enough time would be consolidated into a long-term memory. Later research showed this to be incorrect. Research has shown that direct injections of cortisol or epinephrine aids in the storage of recent experiences. This stands true for stimulation of the amygdala. This proves that excitement enhances memory by the stimulation of hormones that affect the amygdala. Excessive or prolonged stress (with prolonged cortisol) may hurt memory storage. Patients with amygdalar damage are no more likely to remember emotionally charged words than no emotionally charged ones. The hippocampus remains important for explicit memory. The hippocampus is also important for the memory consolidation. The hippocampus receives input from different parts of the cortex and sends its output out to different parts of the brain already. The input comes from secondary and tertiary sensory areas that have processed the added information. Hippocampal damage may also cause memory loss and problems with the memory storage.

The cerebral cortex, the outer layer of the brain, stores most long-term memory in different zones, depending on what kind of processing the information involves: language, sensory input, problem-solving, and so forth. In addition, memory involves communication among the brain’s network of neurons, millions of cells activated by brain chemicals called neurotransmitters.
1.4. MEMORY TECHNIQUES (MNEMONICS)

Mnemonic is a memory enhancing instructional strategy that involves teaching students to link new information that is taught to information they already know. Mnemonic instruction is useful for students across a wide age range. Though students in the early elementary grades are usually not expected to learn and recall as many facts as older students, they are involved in a number of activities that involve making associations that employ mnemonic principles. Mnemonics are clues of any kind that help us remember something, usually by causing us to associate the information we want to remember with a visual image, a sentence, or a word. The idea behind using mnemonics is to encode difficult-to-remember information in a way that is much easier to remember. Our brains evolved to code and interpret complex stimuli such as images, colors, structures, sounds, smells, tastes, touch, positions, emotions and language. We use these to make sophisticated models of the world we live in. Our memories store all of these very effectively. Mnemonics help learners recall larger pieces of information, especially in the form of lists like characteristics, steps, stages, parts, phases, etc.

Mnemonic’ is another word for memory tool. Mnemonics are the techniques for remembering the information that is otherwise quite difficult to recall. A study by Gerald R. Miller notes that mnemonics increased recall. He found that students who regularly used mnemonic devices increased test scores up to 77%. Many types of mnemonics stayed and which type works best is limited only by the imagination of each individual learner. If once mastered simple memory systems, can use mnemonic enhancers to expand the range of the systems. So by using these techniques to expand mnemonics, one can significantly enhance the power of simple systems and the volumes of information that can be held.
Most people believe that their memories get worse as they get older. This is true only for people who do not use their memories properly: memory is like a muscle – the more it is used, the better it gets. The more it is neglected, the worse it gets.

If our brains are like computers, we’d simply add a chip to upgrade our memory. However, the human brain is more complex than even the most advanced machine, so improving human memory requires slightly more effort and strategies or mnemonics.

**Memory cannot be Improved by**

a. By reading a book on memory improvement,
b. By listening to memory improvement CDs or audio tapes,
c. By watching memory improvement videos,
d. By attending a seminar on memory improvement,
e. By taking memory improvement pills or medication,

The whole idea that one can improve their memory by using the above methods appears as ridiculous as using them to get in physical shape and build muscles. Can someone lose weight and become a bodybuilder just by reading a book about bodybuilders? Or by watching some videos about them? Or maybe become a great dancer by reading a book on dancing? The only way to lose weight and get in physical shape is going to the gym and working out. The only way to form any practical skill is going though the practical training. It’s as simple as that; there are no other ways. There are no magic pills; no shortcuts. Memory Improvement is no different. It should be based on practical training and mental workout.

By considering above fact it can be said that by practicing Memory techniques one can improve the memory. In due course it has been proved by
many research studies that practicing mnemonics like acronyms or coding, phonetic mnemonics, spelling mnemonics, keyword method, concept map, semantic organization, peg word method, method of loci, mind map etc., will enhance the memory. (In the sub title 1.5 the discussion has done on some of the mnemonics).

1.5. MEMORY TRAINING PACKAGE AND MEMORY TECHNIQUES INTEGRATED IN THE PACKAGE

"Memory is like a muscle –

_The more it is used, the better it gets._

_The more it is neglected, the worse it gets_"

Memory Training Package works by making links between information, apt facts into mental structures and frameworks. Gives more activity of remembering, the more facts and frameworks to hold, the more additional facts and ideas will slot easily into long term memory. Memory training package help the students to retrieve the information when they needed and enhance their memory. It trains brain to remember the gained experiences. Memory is the mental activity of recalling information that learned or experienced. That simple definition, though, covers a complex process that involves many different parts of the brain and serves in disparate ways. Memory works like a bank. You can get to it, only if you put it there. If you didn't deposit it, you can't collect it when you need it.
Memory, like muscular strength, is a "use it or lose it" proposition. The more we work out our brain, the better we’ll be able to process and remember information. Novelty and sensory stimulation are the foundation of brain exercise. If we break our routine in a challenging way, we’re using brain pathways we weren’t using before. Try a “neurobic” exercise – an aerobic exercise for our brain that forces us to use our faculties in unusual ways by memory tools. The prepared package represented in appendix 1.

The memory Training Package included more than a few mnemonics (Memory techniques) prescribed by psychologists and experimentalists. So let us know some facts about mnemonics in brief.

**Memory Techniques integrated in the Memory Training Package**

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<thead>
<tr>
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<td>Acronyms</td>
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<td>Method of Loci</td>
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<tr>
<td>Peg word Method</td>
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<tr>
<td>Concept Map</td>
</tr>
<tr>
<td>Mind Map</td>
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<tr>
<td>Key Word Method</td>
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<td>Number-Consonant System</td>
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</table>

1. **Acronyms**

Acronyms are very common in ordinary language and in many fields. Acronyms can be formed by using each first letter from a group of words or of sentence to form a new word. One common mnemonic for remembering lists consists of an easily remembered acronyms or phrase with an acronym that is
associated with the list items. The idea lends itself well to memorizing hard-to-break passwords as well. Acronyms are very common in ordinary language and in many fields. Acronyms can be formed by using each first letter from a group of words or of sentence to form a new word. This is particularly useful when remembering words in a specified order. Some examples of common acronyms include NBA (National Basketball Associations), SCUBA (Self Contained Underwater Breathing Apparatus), BTUs (British Thermal Units), and LASER (Light Amplification by Stimulated Emission of Radiation). For example, to remember the "classic" named colours of the rainbow (Red, Orange, Yellow, Green, Blue, Indigo, Violet), it can be easier for some people to remember the mnemonics "Roy G. Biv" (a made-up name) instead. Or in reverse "VIBGYOR" pronounced "vib-GYOr". or easier: Richard Of York Gave Battle In Vain.

**Acronyms and initialisms** are abbreviations that are formed using the initial components in a phrase or name. These components may be individual letters or parts of words.

An acronym is a word that is made up by taking the first letter from each word that you want to remember and making a new word from all those letters. For example, if you want to remember the names of the Great Lakes, you could learn the acronym HOMES — Huron, Ontario, Michigan, Erie, Superior. Remembering the animal classification order from Biology was pretty difficult (Kingdom, Phylum, Class, Order, Family, Genus, Species) but a mnemonic sentence makes it easy. Just think “King Phillip Can Only Find His Green Shoes” and you just nailed it! The classification for human beings adds another mnemonic; “Anthropology Can Make People Hate Helping (the) Sick” for “Anamalia, Cordata, Mamalis, Primate, Hominidae, Homo Sapiens."
Nomenclature

In 1943, David Davis of Bell Laboratories coined the term *acronym* as the name for a word created from the first letters of each word in a series of words (such as *sonar*, created from *sound navigation and ranging*). While the word *abbreviation* refers to any shortened form of a word or a phrase, some have used *initialism* or *alphabetism* to refer to an abbreviation formed simply from, and used simply as, a string of initials. The terms *initialism* and *alphabetism* are neither widely used nor widely known. Although the term *acronym* is widely used to describe any abbreviation formed from initial letters, most dictionaries define *acronym* to mean "a word" in its original sense.

The term for the word-by-word reconstruction of an acronym or initialism is an *expansion*.

Comparing a Few Examples of Each Type

1) Pronounced as a word, containing only initial letters
   a) AIDS: acquired immune deficiency syndrome
   b) ASBO: Anti-Social Behaviour Order
   c) NATO: North Atlantic Treaty Organization
   d) Scuba: self-contained underwater breathing apparatus

2) Pronounced as a word, containing non-initial letters
   a) Amphetamine: alpha-methyl-phenethylamine
   b) Gestapo: Geheime Staatspolizei (secret state police)
   c) Interpol: International Criminal Police Organization
   d) Radar: radio detection and ranging
3) Pronounced as a word or names of letters, depending on speaker or context
   a) **FAQ**: frequently asked questions
   b) **IRA**: When used for Individual Retirement Account, can be pronounced as letters (*I R A*) or as a word
   c) **SAT**: (previously) Scholastic Achievement (or Aptitude) Test(s), now claimed not to stand for anything.
   d) **SQL**: Structured Query Language.

4) Pronounced as a combination of names of letters and a word
   a) **CD-ROM**: Compact Disc read-only memory
   b) **IUPAC**: International Union of Pure and Applied Chemistry
   c) **JPEG**: Joint Photographic Experts Group
   d) **SFMOMA**: San Francisco Museum of Modern Art

2. **Method of Loci**

   Among the best documented of the early mnemonics devices is the method of Loci. The method of Loci consists of identification of familiar places sequentially arranged, creation of items associated with the places, recall by means of revisiting the places by imagination which serves as a cue for the associated items. Select any location that you have spent a lot of time in and know well. Good for kinesthetic learners. Imagine yourself walking through the location, selecting clearly defined places—the door, sofa, refrigerator, shelf, etc. Imagine yourself putting objects that you need to remember into each of these places by walking through this location in a direct path. This loci technique was used by ancient orators to remember speeches, and it combines the use of organization, visual memory, and association. Before using the technique, you must identify a common path that you walk. This can be the walk from your dorm to class, a walk around your house, whatever is familiar. What is essential is that you have a vivid
visual memory of the path and objects along it. Once you have determined your path, imagine yourself walking along it, and identify specific landmarks that you will pass. For example, the first landmark on your walk to house could be your dorm room, next may be the front of the residence hall, next a familiar statue you pass, etc. The number of landmarks you choose will depend on the number of things you want to remember.

Once you have determined your path and visualized the landmarks, you are ready to use the path to remember your material. This is done by mentally associating each piece of information that you need to remember with one of these landmarks. For example, if you are trying to remember a list of mnemonics, you might remember the first--acronyms--by picturing SCUBA gear in your dorm room (SCUBA is an acronym).

You do not have to limit this to a path. You can use the same type of technique with just about any visual image that you can divide into specific sections. The most important thing is that you use something with which you are very familiar.

Example: As a simple example, want to remember something mundane like mentioned shopping list:

*Coffee, salad, vegetables, bread, kitchen paper, fish, chicken breasts, pork chops, soup, fruit, bath tub cleaner.*

This list could associate with a journey to a supermarket. Mnemonic images could be:

1. Front door: spilt coffee grains on the doormat (coffee);
2. Rose bush in the front garden: growing lettuce leaves and tomatoes around the roses (Salad);
3. Car: with potatoes, onions and cauliflower on the driver's seat (vegetables);

4. End of the road: an arch of French bread over the road (bread);

5. Past garage: with its sign wrapped in kitchen roll (kitchen role);

6. Under railway bridge: from which haddock and cod are dangling by their tails (fish);

7. Traffic lights: chickens squawking and flapping on top of lights (chicken breasts);

8. Past church: in front of which a pig is doing karate, breaking boards (pork);

9. Under office block: with a soup slick underneath: my car tires send up jets of tomato soup as I drive through it (soup);

10. Past car park: with apples and oranges tumbling from the top level (fruit);

11. Supermarket car park: a filthy bath tub is parked in the space next to my car (bath tub cleaner);

Practice the loci mnemonic technique to sharpen the skills. People would memorize palaces with hundreds if not thousands of loci. With such a memory palace you can remember a lot of things but you also need to train a lot to use properly such big places. Memory performers use them routinely but their experience is that they have to rehearse for hours every day to use them.

3. Peg Word Method

The peg word system has several forms, but the basic idea is that one learns a set of words that serve as 'pegs' on which items to be memorized are 'hung'. The technique works by help to build up pictures in mind, which represent numbers by things that peg with the number, and then can link these pictures to images of the things to be remembered. Peg word method relates to numbers.
This would mean that need to link information in words with numbers. The way is simple. Teachers can use these peg words to help students remember facts.

**Example:** To use this mnemonic need to learn a nonsense rhyme off by heart. Take a few moments to memorize this.

1. One is a bun
2. Two is a shoe
3. Three is a tree
4. Four is a door
5. Five is a live
6. Six is sticks
7. Seven is heaven
8. Eight is a gate
9. Nine is wine
10. Ten is a hen

Learn this rhyme off by heart and link each number to people, objects or other numbers. To remember a series of numbers, such as a phone number, it might to link these objects in a series using a story. For example: The telephone number: 654383 Converts to: Sticks-Hive-Door-Tree-Gate-Tree

Why you would want to remember a list of specific words? There are several possible uses for this method. If you have a list of things to do, you can give each item on your list a keyword that will help you remember the whole concept.

After the peg word list system has been learned the learner must ‘hook’ a set of items to the pegs. One way this can be done by imagining an interaction between the peg words and to be learned word. For example: if the first word in a series is elephant, it can be imagined to interact with bun remember one is bun
then might think of an "elephant burger" in which a great elephant is squeezed into a small hamburger bun. If the next word is lion, remember two is shoe imagine lion wearing tennis shoe.

This method could also be used for a grocery list, or for remembering, for example, the list of presidents. If, however, the list of words is longer than ten, memorize a longer reference list. Since the rhyming sounds become repetitive, it may be better to use the number-letter system a different system that can be used to create a new reference list.

4. Concept Map

Concept map is one of the mnemonics used to describe the concepts meaningfully and help the students to recall the concepts. Concept maps are tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts or propositions, (indicated by a connecting line and linking word) between two concepts. Linking words on the line specify the relationship between the two concepts. Joe Novak defines "concept" as a perceived regularity in events or objects, or records of events or objects, designated by a label. The label for most concepts is a word, although sometimes we use symbols such as + or %. i.e. Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts connected with other words to form a meaningful statement. Sometimes these are called semantic units or units of meaning. In a concept map the concepts should be represented in a hierarchical fashion with the most inclusive, most general concepts at the top of the map and the more specific, less general concepts arranged hierarchically below. The hierarchical structure for a particular domain of knowledge also depends on the context in which that knowledge is being applied or considered. Therefore, it is best to construct concept maps with
reference to some particular question we seek to answer or some situation or event that we are trying to understand through the organization of knowledge in the form of a concept map. Another important characteristic of concept maps is the inclusion of "cross-links." These are relationships (propositions = linking lines with linking words) between concepts in different domains of the concept map. Cross-links help us to see how some domains of knowledge represented on the map are related to each other. In the creation of new knowledge, cross-links often represent creative leaps on the part of the knowledge producer. Final features that may be added to concept maps are specific examples or actual images of events or objects that help to clarify the meaning of a given concept.

As defined above, concepts and propositions are the building blocks for knowledge in any domain. Use the analogy that concepts are like the atoms of matter and propositions are like the molecules of matter. As people create and observe new or existing objects or events, one should continue to create new knowledge.

Concept mapping has (developed by Novak, 1990, 1996, 1998) shown to be classroom technique that can enhance learning in sciences. Concept mapping can be a metacognitive tool, promoting understanding in which new material interacts with the students’ existing knowledge. The interaction of new and existing knowledge is made easier if the existing knowledge is made explicit to both teacher and student. This gets described as meaningful learning. The construction of concept map intended to reveal the perception and reproduction of memorized facts.

**Constructing Good Concept Maps**

In learning to construct a concept map, it is important to begin with a domain (an area) of knowledge that is very familiar to the person constructing the map. Since concept map structures are dependent on the context in which they
would be used, it is best to identify a segment of a text, a laboratory activity, or a particular problem or question that one is trying to understand. This creates a context that will help to determine the hierarchical structure of the concept map. It is also helpful to select a limited domain of knowledge for the first concept maps. Once a domain has been selected, the next step is to identify the key concepts that apply to this domain. These could be listed, and then from this list a rank order should be established from the most general, most inclusive concept, for this particular problem or situation, to the most specific, least general concept. Although this rank order may be only approximate, it helps to begin the process of map construction.

The next step is to construct a preliminary concept map. This can be done by writing all of the concepts on Post-its, or preferably by using a computer software program. Post-its allow a group to work on a whiteboard or butcher paper and to move concepts around easily. This is necessary as one begins to struggle with the process of building a good hierarchical organization. Computer software programs are even better in that they allow moving of concepts together with linking statements and also the moving of groups of concepts and links to restructure the map. They also permit a computer printout, producing a nice product that can be e-mailed or in other ways easily shared with collaborators or the other interested parties.

Students often comment that it is hard to add linking words onto their concept map. This is because they poorly understand the relationship between the concepts and it is the linking words that specify this relationship. Once students begin to focus in on good linking words, and also identification of good cross-links, they can see that every concept could be related to every other concept. This also produces some frustration, and they must choose to identify the most prominent and most useful cross-links. This process involves what Bloom (1956)
identified as high levels of cognitive performance, namely evaluation and synthesis of knowledge. Concept mapping is an easy way to achieve very high levels of cognitive performance, when the process is done well. This is one reason as to why concept mapping can be a very powerful evaluation tool.

Concept Map Helps in Meaningful Learning and Keep Things into Long Term Memory

Concept maps were based on the learning psychology of David Ausubel (1963, 1968, 1978). The fundamental idea in Ausubel's cognitive psychology is that learning takes place by the assimilation of new concepts and propositions into existing concept propositional frameworks held by the learner. The question sometimes arises as to the origin of the first concepts; these are acquired by children during the ages of birth to three years, when they recognize regularities in the world around them and begin to identify language labels or symbols for these regularities. This is a phenomenal ability that is part of the evolutionary heritage of all normal human beings. After the age of 3, new concepts and propositional learning is mediated heavily by language, and takes place primarily by a reception learning process where new meanings are obtained by asking questions and getting clarification of relationships between the old concepts and propositions and new concepts, propositions. Ausubel made the very important distinction between rote learning and meaningful learning. Meaningful learning requires three conditions:

- The material to be learned must be conceptually clear and presented with language and examples relatable to the learner's prior knowledge. Concept maps can be helpful to meet this condition, both by identifying large general concepts prior to instruction in more specific concepts, and by assisting in the sequencing of learning tasks though progressively more
explicit knowledge that can be anchored into developing conceptual frameworks.

- The learner must possess relevant prior knowledge. This condition is easily met after age 3 for virtually any domain of subject matter, but it is necessary to be careful and explicit in building concept frameworks if one hopes to present detailed specific knowledge in any field in subsequent lessons. We see, therefore, that conditions (1) and (2) are interrelated and both are important.

- The learner must choose to learn meaningfully. The one condition over which the teacher or mentor has only indirect control is the motivation of students to choose to learn by attempting to incorporate new meanings into their prior knowledge, rather than simply memorizing concept definitions or propositional statements or computational procedures. The control over this choice is primarily in the evaluation strategies used, and typical objective tests seldom require more than rote learning (Holden, 1992). In fact, the worst forms of objective tests, or short-answers tests, require verbatim recall of statements and this may be impeded by meaningful learning where new knowledge is assimilated into existing frameworks, making it difficult to recall specific, verbatim definitions or descriptions.

One of the powerful uses of concept maps is not only as a learning tool but also as an evaluation tool, thus encouraging students to use meaningful-mode learning patterns (Novak & Gowin, 1984; Novak, 1990, Mintzes, Wandersee and Novak, 2000).

Concept maps are tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts or propositions, *(indicated by a connecting line*
and linking word) between two concepts. Linking words on the line specify the relationship between the two concepts. Joe Novak defines "concept" as a perceived regularity in events or objects, or records of events or objects, designated by a label.

For Example 1:

![Concept Map](image)

**Figure 6. Shows an Example to Construct Concept Map**

Example 2.

![Concept Map](image)

**Figure 7. An Example for Concept Map prepared for a Science Content**
5. Mind Map

A mind map is a diagram used to represent words, ideas, tasks, or other items linked and arranged around a central key word or the idea. Mind maps are used to generate, visualize, structure, and classify ideas, and as an aid in study, organization, problem solving, decision making, and writing. The elements of a given mind map are arranged intuitively according to the importance of the concepts and classified into groupings, branches, or areas, with the goal of representing semantic or other connections between portions of information. Mind maps may also aid in recall of existing memories. By presenting ideas in a radial, graphical, non-linear manner, mind maps encourage the brainstorming approach for planning and organizational tasks. Though the branches of a mind map represent the hierarchical tree structures, their radial arrangement disrupts the prioritizing of concepts typically associated with hierarchies presented with more linear visual cues. This orientation towards brainstorming encourages the users to enumerate and connect concepts without a tendency to begin within a particular conceptual framework.

The mind map can be contrasted with the similar idea of concept mapping. The former is based on radial hierarchies and tree structures denoting relationships with a central governing concept, whereas concept maps are based on connections between concepts in more diverse patterns.

Characteristics

Mind maps are, by definition, a graphical method of taking notes. The visual basis of them helps one to distinguish words or ideas, often with colors and symbols. They generally take a hierarchical or tree branch format, with ideas branching into their subsections. Mind maps allow for greater creativity when recording ideas and information, as well as allowing the note-taker to associate words with visual representations. Mind maps and concept maps are different in
that mind maps focus on only one word or idea, whereas concept maps connect multiple words or ideas. A key distinction between mind maps and modeling graphs is that there is no rigorous right or wrong with mind maps, relying on the arbitrariness of mnemonic systems. A UML Diagram or a Semantic network has structured elements modeling relationships with objects connected by lines for relationships. This is generally done in black and white with clear and agreed iconography. Mind maps are for a different purpose, being collections of words structured by the mental context of the author with visual mnemonics to help in memory and organization, so the use of colour and icons and visual links is informal but necessary for the proper functioning of the mind map.

Mind Map Guidelines

The author Tony Buzan, In his books on Mind Maps suggests using the following guidelines for creating Mind Maps:

1. Start in the center with an image of the topic, using at least 3 colors.
2. Use images, symbols, codes, and dimensions throughout your Mind Map.
3. Select key words and print using upper or lower case letters.
4. Each word/image is best alone and sitting on its own line.
5. The lines should be connected, starting from the central image. The central lines are thicker, organic and flowing, becoming thinner as they radiate out from the centre.
6. Make the lines the same length as the word/image they support.
7. Use multiple colors throughout the Mind Map, for visual stimulation and also to encode or group.
8. Develop your own personal style of Mind Mapping.
9. Use emphasis and show associations in your Mind Map.
10. Keep the Mind Map clear by using radial hierarchy, numerical order or outlines to embrace your branches.
This list is itself more concise than a prose version of the same information and the Mind Map of these guidelines is itself intended to be more memorable and quicker to scan than either the prose or the list.

Mind Mapping is a useful technique that improves the way you take notes, and supports and enhances your creative problem solving. By using Mind Maps, can quickly identify and understand the structure of a subject, and the way that pieces of information fit together, as well as recording the raw facts contained in normal notes. More than this, Mind Maps encourage creative problem solving, and they hold information in a format that your mind finds easy to remember and quick to review. Popularized by Tony Buzan, Mind Maps abandon the list format of conventional note taking. They do this in favor of a two-dimensional structure. As such, a good Mind Map shows the 'shape' of the subject, the relative importance of individual points, and the way in which facts relate to one another.

Example 1.

Figure 8. An Example for Mind Map
Example 2.

Figure 9. An Example for the Handwritten Mind Map

Example 3

Figure 10. An Example for Digital Mind Map
6. **Key Word Method**

A slightly different from the peg word technique, used by Atkinson and Raugh (1975) First, after considering the word need to remember, selecting a key word in which sounds like the word to be remembered. Next, imagining an image which involves the key word with the meaning of the to remember word. Numerous competing methods of vocabulary acquisition have received a great deal of attention, including the keyword method and the learning of word roots. Atkinson's (1975) keyword method is a mnemonic technique in which a new word is associated with a similar-sounding familiar word, or keyword. A mental image is then formed linking the unfamiliar word to the keyword. For example, if the new word is “celerity”, meaning “speed,” the keyword could be “celery.” A mental image of a piece of celery flying through the air could then be formed. Atkinson (1975) originally used this technique with the learning of foreign vocabulary, but it has since been applied to vocabulary in one’s native language (e.g., Wang & Thomas, 1995) and a wide variety of other areas. Several studies have investigated the characteristics of the keyword method. For example, Hall, Wilson, and Patterson (1981) suggest that the keyword method is most useful to less experienced learners, such as the young. They also found that keywords provided by the experimenter yielded better recall than when participants were required to create their own keywords. Thomas and Wang (1996) reached a similar conclusion and suggest that this lessens the likelihood that students will use this method on their own.

Research on the keyword method has been mixed, revealing both strengths and weaknesses of the technique. Atkinson (1975) found that participants instructed in the use of keywords learned more Russian words in two trials than did a control group that was given one extra trial. Similarly, keyword mnemonics have been shown to be an advantage over rote learning in both immediate and
delayed recall (Carney & Levin, 1998). The keyword technique is also more effective than semantic context learning in immediate recall (Wang & Thomas, 1995). Recognizing word roots is an important process in vocabulary learning. Freyd and Baron (1982) found that “superior” fifth graders were better able to use roots to derive meaning than were average eighth graders. Likewise, Levin, Carney, and Pressley (1988) report that teaching roots to students enhances their ability to infer meaning of certain vocabulary. Further, they found that students who learned roots through the keyword method were just as able, if not more so, to infer meanings from roots as were students in free study and semantic conditions. This finding applies to both immediate and delayed recall and shows that mnemonically-learned material can be applied.

Example:

**Barrister** is another word for lawyer. What's the keyword for barrister? Its **bear**. The keyword for barrister is **bear**, and barrister means lawyer. Then display picture and say to students look at this picture of a bear acting like a lawyer. The **bear** is the keyword for barrister, So remember this picture of a bear acting like a lawyer. When they hear the word **barrister**, make them first think of the keyword **bear** and remember what the bear is doing in the picture.

7. **Number-Consonant System: (Major System)**

The number-consonant system is one of the most powerful memory systems available. It takes a lot of time to master, but once learned is very powerful. The building blocks of the system are the association of the numbers. The **Major System** (also called the **phonetic number system** or **phonetic mnemonic system**) is a mnemonic technique used to aid in memorizing numbers. The system works by converting numbers into consonant sounds, then into words by adding vowels. The system works on the principle that emotive images can be remembered more easily than numbers.
Each numeral is associated with several consonants. Vowels and the consonants w, h and y are ignored. These can be used as "fillers" to make sensible words from the resulting consonant sequences. The most popular sequence is:

<table>
<thead>
<tr>
<th>Numeral</th>
<th>Associated Consonant</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>s, z, c</td>
<td>remember as 'z is first letter of zero'. The other letters have a similar sound.</td>
</tr>
<tr>
<td>1</td>
<td>d, t, th -</td>
<td>remember as letters with 1 down stroke</td>
</tr>
<tr>
<td>2</td>
<td>N</td>
<td>Remember as having 2 down strokes</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>Has three down stroke</td>
</tr>
<tr>
<td>4</td>
<td>R</td>
<td>Last letter of four</td>
</tr>
<tr>
<td>5</td>
<td>L</td>
<td>L is the Roman numeral for fifty</td>
</tr>
<tr>
<td>6</td>
<td>J, sh, soft-ch, dg, soft-g</td>
<td>A script j has a lower loop/g is almost a 6 flipped over.</td>
</tr>
<tr>
<td>7</td>
<td>K, hard-ch, hard-c, hard-g, ng</td>
<td>Imagine K as two 7s rotated and glued together</td>
</tr>
<tr>
<td>8</td>
<td>F, v</td>
<td>Script f resembles a figure-8, V sounds similar</td>
</tr>
<tr>
<td>9</td>
<td>P, b</td>
<td>b as 9 rotated 180 degrees</td>
</tr>
</tbody>
</table>

Each numeral maps to a set of similar sounds with similar mouth and tongue positions. The link is phonetic, that is to say, it is the consonant sounds that matter, not the spelling. Therefore a word like action would encode the number 762 (k-ch-n), not 712 (k-t-n); and ghost would be 701 (g-z-t), while, because the gh in enough is pronounced like an f, the word enough encodes the number 28 (n-f). Similarly, double letters are disregarded. The word missile is mapped to 305 (m-z-l), not 3005 (m-z-z-l). To encode 3005 one would use something like mossy sail. Often the mapping is compact. Hindquarters, for example, translates unambiguously to 2174140 (n-d-qu-r-t-r-z), which amounts to 7 digits encoded by 8 letters, and can be easily visualized.

The system is also employed with phone numbers. One would typically make up multiple words, preferably a sentence, or an ordered sequence of images featuring the owner of the number.
The groups of similar sounds and the rules for applying the mappings are almost always fixed, but other hooks and mappings can be used as long as the person using the system can remember them and apply them consistently. The magician Derren Brown, for instance, chooses the number 5 to map to the /f and v sounds because the word 'five' uses both of those sounds.

The Major System can be combined with a peg system for remembering lists, and is sometimes used also as a method of generating the pegs. It can also be combined with other memory techniques such as rhyming, substitute words, or the method of loci. Repetition and concentration using the ordinary memory is still required. An advantage of the major system is that it is possible to use a computer to automatically translate the number into a set of words. One can then pick the best of several alternatives.

1.6. NEED AND IMPORTANCE OF THE STUDY

Memory is another name for ability; it is a part of human intelligence. It also indicates effective recollection of experiences of the past. It is the inner ability. Memory depends upon internal heredity and biological factors. As individual differences, memory power also varies from person to person. At first, one cannot remember all the aspects that experienced and some of the experiences are stayed somewhere in one’s sub conscious level and some are in conscious level; it depends upon the mind of experiences.

The power of memorization varies from one person to another. Some have average memory, for some memory is natural ability, but for someone it is continues practice of learning process, the proper methods of learning helps to increase their memory.

These days higher learning curriculum is drastically advancing. Increasing complexity of the study curriculum adds heavy stress on the students’ learning.
Hence teachers face the problem of the retention of students. Some experimental studies suggest that we cannot eliminate forgetting completely, but we can take the steps to increase retention of students.

Memory and learning are interrelated; learning justifies academic achievement of students. The exam system is based on memory. Memory plays vital role in better achievement. One who have good memory he can achieve more. Teachers instruct the lesson but don’t acquaint how to keep learnt thing into their memory. Thus an attempt was made by the investigator to prepare the memory training package by inculcating memory techniques given by eminent psychologists and experts to help the students to become aware of their memory practice, in addition the package helps teachers to teach the lesson by make use of memory techniques and practice techniques in the classroom.

Many studies were done on memory by eminent psychologist and investigators, like: A Study of Reading Skill and Memory Scanning (Robert Kail And Christine Vereb), A Study Of Mnemotechnics: Some Limitations Of The Mnemonic Keyword Method For The Study Of Foreign Language Vocabulary (Richard J. Patterson, James, W. Hall, Kim. P. Willson), A Study On Individual And Classroom Memory Support Strategies (Lyn Carno), A Study On Memorization Processes Involved In Performance On The Visual-Squential Memory Subtest of The Illinoi Test Psycholinguistic Abilities (Charles Bowen, Tony Gelabert, And Joseph Torgesen), A Study On Auditory Short-Term Memory And Digit Span: Normal Versus Poor Readers (Carr Payne M.), A Study on Working Memory Contributions To Analytical And Creative Writing Samples In High School Students (Vanderburgh, Robert), The Underlying Memory Processes of adults Spontaneous and Implanted False Memories (Mojardin-Heraldex, Ambrocio), A study on Visual Learning in a Sample of Native American Children: A Study of the Effects of Practice on Memory (Shah Minoo Gunawant), A Study
on Strategic Flexibility and Lexical Access Fluency to Working Memory and Reading in Ninth-Grade Readers (Ruggiero, Joseph James) etc., (details of studies shown in chapter 2)

Above studies remained evident of the working memory and most were worked on vocabulary, reading, visual learning. Present package is distinct from all these studies, because no effort was made to prepare the Memory Training Package for the purpose to implement in school subjects. Present study anticipated to prepare the package by inculcating many important mnemotechnics as described in the next sub chapter to help the students to keep the learnt content easily into memory. Package gives an idea to students to practice the memory techniques in their studies and accomplish more. Because Memory, like muscular strength, is a “use it or lose it” proposition. The more we work out our brain, the better we’ll be able to process and remember information. Novelty and sensory stimulation are the foundation of brain exercise. Memory is similar to muscle training, by training the brain and by practicing the memory techniques persistently one can repossess the stored events easily when needed. Thus to make a new-fangled effort in practices of education this study was conducted with upbeat hope of success by investigator.

1.7. STATEMENT OF PROBLEM

“A Study on the Effectiveness of a Specially Designed Memory Training Package (MTP) on Enhancement of Memory of Secondary School Students”

1.8. OBJECTIVES OF THE STUDY

The main aims of the study were to Develop and Validate the Memory Training Package and ensure the effectiveness of Memory Training Package on Enhancement of Memory of Secondary School Students. The specific objectives are as follows...
1. To Study the Effectiveness of Memory Training Package for the enhancement of memory among Secondary School Students.

2. To study the difference in the level of the enhancement of memory of boys and girls of secondary school students taught by Memory Training Package.

3. To study the level of retention of Secondary School Students taught by Memory Training Package.

4. To study the difference in the level of retention of boys and girls of Secondary School students taught by Memory Training Package.

5. To Study the relationship between Memory and Intelligence of secondary school students.

1.9. VARIABLES

Independent Variable -
1. Memory Training Programme.
2. Conventional Method

Dependent Variable -
Enhancement of memory.

Secondary Independent Variable - Intelligence

Moderate Variables - Gender

1.10. HYPOTHESES

To study the objective 1 the hypotheses 1 and 2 were framed, for objective 2 the hypotheses 3, 4, 5, 6, 7, 8, 9, 10 were framed, for the objective 3 the hypothesis 11 was framed, for the objective 4 the hypotheses 12, 13, 14, 15 were framed for the objective 5 the hypothesis 16 was framed. In these hypotheses the hypothesis 2nd is directional hypothesis and others are null hypotheses.

Objective 1: To Study the Effectiveness of Memory Training Package for the enhancement of memory among Secondary School Students.
1. There exists no significant difference between the mean gain scores on enhancement of memory of experimental and control group before teaching Memory Training Package (MTP).

2. There exists significant difference between the mean gain scores on enhancement of memory of experimental and control group after teaching of Memory Training Package (MTP).

Objective 2: To study the difference in the level of the enhancement of memory of boys and girls of secondary school students taught by Memory Training Package.

3. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of experimental group before teaching of Memory Training Package (MTP).

4. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of experimental group in their immediate post test after teaching Memory Training Package (MTP).

5. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of control group before teaching of Memory Training Package (MTP).

6. There exists no significant difference between the mean gain scores on the enhancement of memory of boys and girls of control group in their immediate post test after teaching of Memory Training Package (MTP).

7. There exists no significant difference between the mean gain scores on the enhancement of memory of boys of experimental and control group before teaching of Memory Training Package (MTP).

8. There exists no significant difference between the mean gain scores on the enhancement of memory of boys of experimental and control group in
9. There exists no significant difference between the mean gain scores on the enhancement of memory of girls of experimental and control group before teaching of Memory Training Package (MTP).

10. There exists no significant difference between the mean gain scores on the enhancement of memory of girls of experimental and control group in their immediate post-test after teaching of Memory Training Package (MTP).

**Objective 3:** To study the retention of Secondary School Students taught by Memory Training Package.

11. There exists no significant difference between the mean gain scores of experimental group in immediate post test and delayed post test after teaching of Memory Training Package (MTP).

**Objective 4:** To study the difference in the level of retention of boys and girls of Secondary School students taught by Memory Training Package.

12. There exists no significant difference between the mean gain scores of boys and girls of experimental group in their immediate post test.

13. There exists no significant difference between the mean gain scores of boys and girls of experimental group in their delayed post test.

14. There exists no significant difference between the mean gain scores of boys in their immediate post test and delayed post test.

15. There exists no significant difference between the mean gain scores of girls in their immediate post test and delayed post test.

**Objective 5:** To Study the relationship between Memory and Intelligence of secondary school students.
16. There exists no significant relationship between memory and intelligence of secondary school students.

1.11. DELIMITATION OF THE STUDY

1. This study confined to two Government Secondary Schools.
2. This study restricted to Shimoga city only
3. This study limited to 9th Standard Students
4. Study restricted to English medium students.
5. Package included only English and Social Science lessons.
6. Package included only seven memory techniques.

1.12. OPERATIONAL DEFINITIONS OF THE TECHNICAL TERMS

* Memory Training Package

Memory means the power, act, or process of recalling minding facts previously learned or past experience. In present study, memory training package means designed modules to enhance memory of Secondary School Students. MTP trained by the memory techniques like acronyms, method of Loci, Peg word Method, Key word method, concept map, mind map, number consonant system.

* Intelligence

Intelligence is the mental ability to respond quickly and successfully to a new situation use of the faulty of reason in solving problems. In present study intelligence used to see the relationship of with memory.

* Conventional Method of Teaching

Conventional Method of Teaching refers to communicating information through lectures to students consisting of explanation inner spread with teachers’ questions and students answer.
Gender

Gender is in this study refers those biological distinctions which differentiate female from male. In this study Gender refers to boys and girls studying in 9th standard students.

9th Standard Students

9th Standard Students means who are between 14 to 15 years old. Present study the MTP implemented on 9th standard students and ensured the effectiveness of MTP.

1.13. SKELETAL OUTLINE OF THE SUCCEEDING CHAPTERS

The Chapter-I Contains Introduction, concept of Memory, Memory techniques, memory training package, need and importance of study, objectives of the study, statement of the problem, variables of the study, hypotheses, delimitation of the study, definitions of key words.

The Chapter -II Includes importance of Review of Related Literature and studies related to memory, learning packages and some experimental studies.

The Chapter-III Includes Methodology of the study. Design of the study, sampling, validation of the tool, development and validation of the memory training package, tools used, statistical technique used for the study, collection of data.

The Chapter-IV Includes Analysis and Interpretation of data, discussion, results of the study.

The Chapter-V Includes Summary and Conclusion, findings, educational implications of the study, conclusion, suggestions for further research and limitations of the study.