



USE OF SENSORY ORGANS IN THE PROCESS OF LEARNING AND REMEMBERING

INTRODUCTION

Think of a situation where a teacher wants to teach verb and its example to his/her students of class VI. What would be the best way to present this component of grammar in classroom? I am giving three ways here, though the ways to teach the above mentioned topic are not restricted to these three only. The three ways are given below:

- To teach directly by giving or dictating definition and examples to the whole class;
- To show a chart or still picture consisting of people doing certain activities in order to explain the topic to the students; and
- To let students watch a short video clip in which people are involved in different activities in order to grasp the meaning of the concept being taught in the classroom.

The first way directs a teacher to speak in the classroom where students are supposed to listen to the teacher involving their one sense organ i.e., ear in the whole process of learning. Whereas second and third ways denote the use of visual images or clips to cover most of the senses in learning and remembering the concept which is being taught by the teacher in classroom. After a span of time, students may forget the definition given by their teacher but the examples given with support of images and clips will last in students' memory for long duration because of the involvement of two or more senses which can also be called as multisensory learning. In multi- sensory learning, students are engaged in single activity by involvement of two or more senses. According to Shams & Seitz (2008), "The human brain has evolved to develop, learn and operate optimally in multisensory environments."

SENSORY ORGANS AS BASIS OF ALL KNOWLEDGE

Every human being is bestowed by nature with five sense organs except some exceptional. The sense can be defined as "a system that consists of a group of sensory cell types that responds to a specific physical phenomenon, and that corresponds to a particular group of regions within the brain where the signals are received and interpreted." The information collected by our sense organs, including the sense of hearing, smelling, tasting, touching and seeing, forms the basis of all our knowledge. These senses are given in the following figure:

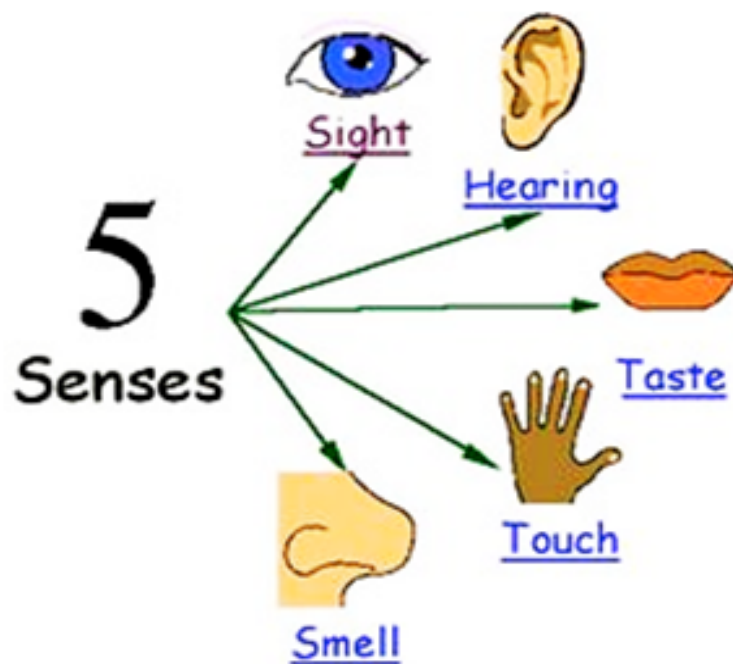


Figure 1: Showing five senses*

*Source: www.educationwithfun.com

The external environment surrounding us consists of a variety of stimuli. Among them, some can be seen, while some can be heard only. There are several others that we can smell, taste and touch. All stimuli present in the surrounding environment provide us with innumerable kinds of information. We have specialized sense organs to deal with these different stimuli.

Sight/vision can be defined as the organ which has the capability to focus and detect image. Vision, among all sense modalities, is the most highly developed in human beings. It is used in approximately 80 per cent of our transactions with the external world (Psychology, NCERT, 2007).

Hearing/ auditory is the sense of sound perception. Auditory sensation begins when sounds enter our ear and stimulates the chief organs of hearing. Ear is the primary receptor of auditory stimuli (Psychology, NCERT, 2007). Taste refers to the capability to detect the taste of substances such as food, certain minerals, poisons, etc.

Skin is a sensory organ from which sensations of touch is produced. The skin is indeed our most consistently active and informing organ of sense. For instance, in a dark vacuum where only minimal sight, hearing, taste, smell and muscle activity would be possible, the skin could still report something about the nature of the surrounding: dry, wet, soft, hard, pressure, cold, hot, etc.

The stimulus for smell sensation consists of molecules of various substances contained in the air. They enter the nasal passage where they dissolve in moist nasal tissues. This brings them in contact with receptor cells contained in olfactory epithelium.

In short it can be said that while our eyes are primarily responsible for vision, ears for hearing, nose for smell and tongue for taste, skin is responsible for the experiences of touch, warmth, cold and pain (Psychology, NCERT, 2007). These sense organs are also known as sensory receptors or information gathering system as they receive or gather information from a variety of sources and bring information to storage system of our memory. Our knowledge of the world around us depends on three basic process, called sensation, attention and perception (Psychology, NCERT, 2007). These processes are clearly depicted in the figure given below:

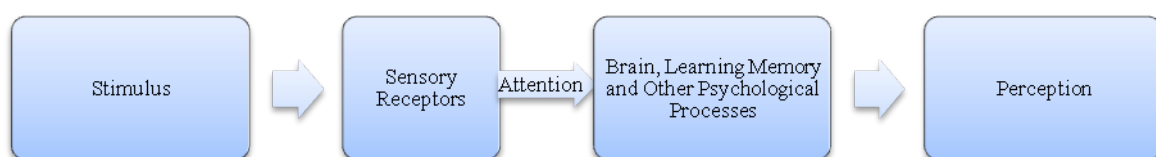


Figure 2: Showing Sub-processes of Perception*

*Source: Psychology, NCERT, 2007

Our sense organs provide us with first-hand information about our external or internal world. The initial experience of a stimulus or an object registered by a particular sense organ is

called sensation. From our external and internal environment, we encounter so many stimuli but only selected of them are noticed. The process through which certain stimuli are selected from a group of others is generally referred to as attention. After attention, the process by which we recognize, interpret or give meaning to the information provided by sense organs is called perception.

LEARNING

Learning maybe defined as “any relatively permanent change in behavior or behavioral potential produced by experience.” According J.W. Santrock (2011), “Learning can be defined as a relatively permanent influence on behaviour, knowledge, and thinking skills, which comes about through experience.” On the basis of this definition, it can be said that learning happens through experience which has permanent influence on behaviour, knowledge and thinking skills of the learners. When learning is seen in the context of teaching and education, it is a natural, social and active process which becomes integrative and contextualized by teachers for effective attainment of objectives and it is based on strength model of students’ abilities, interest and culture. Effect of learning depends upon the maximum and judicious use of sensory organs in the process of sensation, attention and perception.

REMEMBERING

Remembering refers to the subsequent re-accessing of events or information from the past which have been previously encoded and stored in the brain. According to Oxford Advanced Learner’s Dictionary, “It is an act of bringing back to your mind fact, a piece of information, etc. that you knew.” And it is also said to be “the act of keeping or having an image in your memory of an event, person, place, etc from the past.”

Remembering is connected to memory which is defined as the retention of information over time which involves encoding, storage and retrieval. The whole process is called as the information-processing approach. According to this approach, children develop a gradual increasing capacity for processing information, which allows them to acquire increasingly complex knowledge and skills (Halford, 2008).

The processing of information in memory is shown through the following figure:



Figure 3: Showing Processing Information in Memory*

*Source: J.W. Santrock, 2011

For good remembering and memory to work, learners have to take information in, store it or represent it, and then retrieve it for some purpose later. In the figure 3, memory's information processing has been shown and given in the following points:

- Encoding is the first stage by which information is recorded and registered for the first time so that it becomes usable by the memory system. It is a biological event beginning with perception through the senses.
- Storage is the second stage of memory which refers to the process through which information is retained and held over a period of time. Memory storage consists of three stages namely sensory memory, short-term memory and long-term memory. Atkinson and Shiffrin (1968) had given a model of memory which is known as stage model which is represented in the following figure:

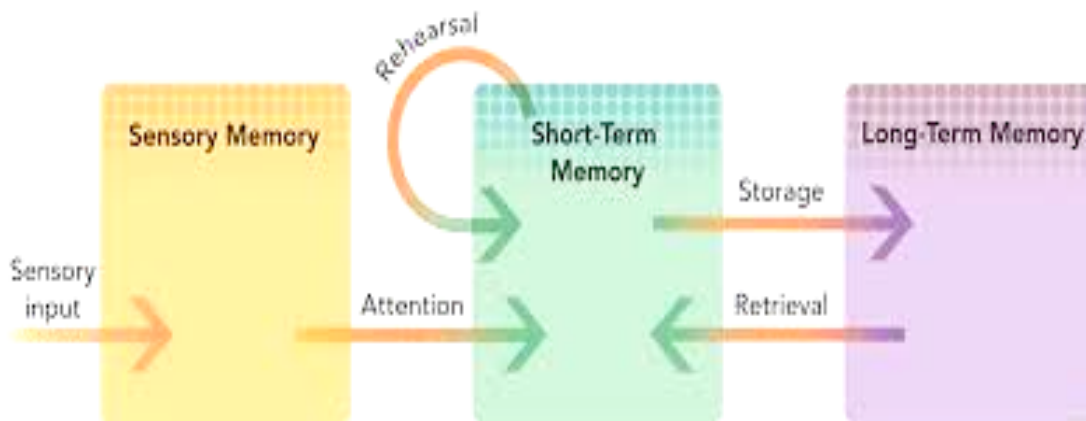


Figure 4: Showing Atkinson and Shiffrin's Theory of Memory*

Sensory memory holds the information from environment in its original sensory form for only an instant, not much longer than the brief time a student is exposed to the visual, auditory and other sensations. Short-term memory is a limited capacity memory system in which information is retained for less than 30 seconds and can get lost if not rehearsed continuously. The figure 4 shows the same thing that attention to

sensory memory makes data reach short term memory but can last only when rehearsed properly and continuously. This aspect has educational implications for teachers and learners. It is also called as working memory. Children, who have better working memory, tend to have better reading comprehension, math skills and problem solving than their counterparts with less effective working memory (Santrock, 2011). Long term memory holds enormous amounts of information for a long period of time in a relatively permanent fashion.

- Retrieval is the third stage of memory which refers to bringing the stored information to one's awareness in order to be used for performing various cognitive tasks such as problem solving or decision making. When something is retrieved from our mental 'data bank', we search our store of memory to find the relevant information which is similar to the working of computer system. Remembering depends upon the encoding, storage and retrieval processes of memory. If children are unable to retrieve a piece of information which is already stored or recorded in brain, it is called forgetting.

USE OF SENSORY ORGANS IN THE PROCESS OF LEARNING AND REMEMBERING

As per the discussion and depiction in above given points, it can be clearly stated that the basis of all knowledge is our sense organs, the first receptors of stimuli from the environment surrounding us. J. M. Erikson (1985) rightly said, "We all have been involved with sensory antennae since our first heart beat." According to him, "All knowledge begins with sensory experiences. The sense information we have accrued through experience is the most personal and valid content of our minds. The thoughts and images we store up in our heads originate in the experience made available to us through our senses."

Referring to the idea of Edgar Dale and his Cone of Experience, it can be said that everyone uses his/her sensory organs to learn and remember things, events, persons, etc. The more organs you engage in this process of learning and remembering, the longer lasting image will be created in mind/memory of the learner which will affect the retention of the learner. The cone of experience by Edgar Dale is given in the following figure:

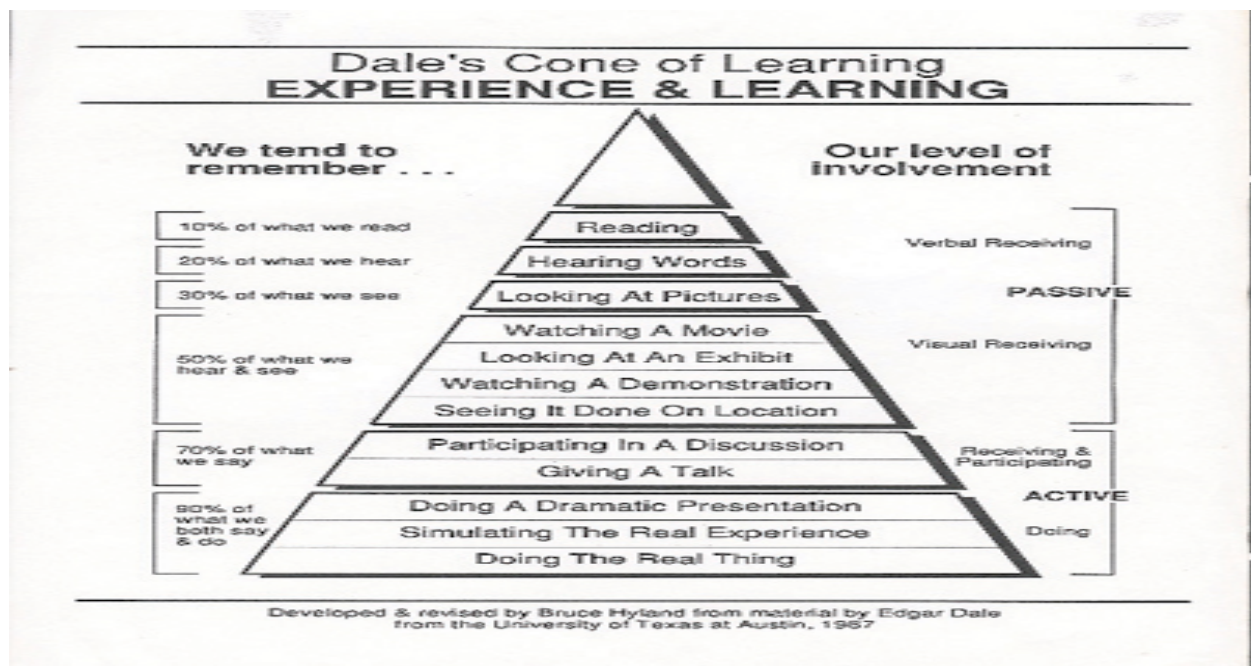


Figure 5: Edgar Dale's Cone of Experience*

Through the figure given above, it can be described that people tend to remember those things with high percentage which involve more and more involvement of sense organs. When the phrase 'to sense' is used, it means that for getting information, all the senses are being tapped and then this results in 'perception'. The role of senses is to inform the mind. Thus, perception will be as sharp or as dull as the quality and validity of the information the senses affirm (Erikson, 1985). Jean Piaget (1952), a Swiss Cognitive Psychologist, advocated the same idea and described motor sensory activity as the means by which the infants and young children learn. Thus, the process of learning and remembering is not possible without use of our sense organs which are receptors of information.

CONCLUSION

Therefore, it can be concluded that sensory organs are the basic sources of all knowledge and originator of learning and remembering. The strength of bond and association of senses with the concept taught by teachers decides its retrieval and lasting effects. So, teachers have to engage as many sense organs in learning process as possible. Nothing can be perceived without the use of senses. At last it can be said that the senses are nurtured, expressed and vitalized by involvement in the various activities in educational settings which provide for and support rich sensory experiences (Erikson, 1985).