

## Quadrant II – Notes

**Programme:** Bachelor of Education (Year I/ Semester VII (Integrated B. Ed)

**Subject:** Education

**Paper Code:** Edu 02/BSBAEDU 02

**Paper Title:** Learner and Learning

**Unit:** 4- Factors Influencing Learning and Classroom Implications

**Module Name:** Perception (Sensation, Processes- selection, organisation, interpretations) and Attention

**Module No:** 23

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### PERCEPTION

***Perception*** is the process of selecting, organizing and interpreting raw sensory data into usable mental representations (meaningful patterns or images) of the world.

However our perceptions are rarely exact replicas of the original stimuli. They are usually changed, biased, coloured, or distorted by our unique set of experiences. Thus perceptions are our personal interpretations of the real world. Social pressure can also influence our perception. Experiments have shown that when making perceptual observations, most people will even change their minds to agree with the majority.

Perception begins with sensations. **Sensation** is the process of *receiving, translating and transmitting* raw sensory data from the external (five senses) and internal (vestibular and kinesthetic) environment to the brain.

**Experiencing Sensations:** To experience sensations our sensory organs must first detect stimuli and convert them into a language the brain can understand. Our sensory organs accomplish both goals. Each sense organ contains specialized cells called **receptors** that respond to a distinct stimulus such as sound waves, odour molecules, visual images ... Receptors receive and process sensory information from the environment before sending it to the brain. The brain receives and processes the information and makes meaning out of it which results in Perception.

Continuous stimulation results in decreased awareness of that stimulus, this process is called ***Sensory Adaptation*** e.g. If one listens to a constant tone for a long time, one's hearing receptors get used to it and so he/she will perceive it as less loud. The aroma of freshly baked cookies can be very overwhelming but the baker who is there for some time in the kitchen, hardly notices the smell. All sensory systems display adaptation but some systems like hearing and smell adapt quickly where as others such as the sense of pain adapt more slowly. By de-emphasizing repetitive information we can be more alert to novel stimuli.

### Characteristics of Perception:

- 1) Perception is always selective. We pick up only those sensations which are useful.
- 2) It is a process of supplementing. Past experiences supply details assumed to be there.
- 3) It is a combining or synthetic activity. It helps us to perceive definite patterns or meaningful figures which have some significance to us.
- 4) It is also an analyzing activity. We try to differentiate smaller units from larger masses.

**Perception and Attention:** Attention is our ability to focus on certain aspects of our immediate, ongoing experience while we ignore other aspects of it. Only those stimuli which we pay attention to are selected and organized into meaningful patterns and principles so as to be interpreted. This will result in our understanding of the world. At a party, if someone mentions your name you will manage to hear that conversation even though it may be occurring in a group other than the one in which you are standing.

### Three groups of factors influence attention:

- i) aspects of the stimulus itself,
- ii) aspects of the perceiver, and
- iii) interactions between specific stimuli and one's unique experiences and interests.

Let's review each factor:

i) Aspects of the stimulus: Altering the stimulus can attract attention. We automatically select/ pay attention to those stimuli that are intense, moving, repetitious, contrasting, novel, familiar or differing in size. Advertising provides some good examples of the principles of attention-getting.

ii) Aspects of the perceiver: Personal attitudes and ideas help determine what aspects of the environment will be noticed. *Set* is an adjustment that is made, often without being aware of it. This is because past experience prepares us to respond in a particular way e.g. Look at the adjoining figure.



How long did it take you to find out what was wrong there?

Another example of *set or expectancy* combined with camouflage is illustrated below. Your prior experience leads you to expect to see certain things. For instance, did you notice that "certain" in the last sentence was misspelled? Further, did you notice that "misspelled" was misspelled in the last sentence? Since you don't expect to find such errors in a text, you're not on guard hence you don't pay attention to them. When you sit up late at night every strange sound can catch your attention and cause anxiety depending on your own internal state. So your internal state can also bias your perceptions. .

iii) Aspects of the stimulus and your own prior experience combine to determine what will attract your attention e.g. *novelty*: unusual hair styles/dress patterns catch your attention or *familiarity*: when someone hands you photos of a party, your attention will first go to the people whom you know.

### Three processes involved in perception are: 1) Selection 2) Organisation 3) Interpretation

**1. Selection.** Three major factors in selection are:

- a) *Physiological factors (biological influences):* there are certain specialized cells in the brain called feature detectors that respond only to certain sensory information.
- b) *Stimulus factors (environmental influences):* Given a wide variety of stimuli to choose from we automatically select the stimuli that are intense, novel, moving, contrasting or repetitions. Parents and teachers often use these attention getting principles. T.V. commercials too base their techniques on this factor.

c) *Psychological factors (intrapsychic influences)*: We tend to attend to some stimuli and not to others according to motivation, personal needs and so on. e.g. when we are hungry our mouth waters at the aroma of good food.

In almost every situation there is an excess of sensory information but the brain manages to sort out the important messages and discard the rest. This process is known as *selective attention*.

The sensory data which is selected is organized according to *form perception and perceptual constancies\* such as size, shape, depth and colour*.

## **2. Organisation:**

Gestalt psychologists were among the first to study how sensory impressions are organized by the brain. The German word *gestalt* means 'whole' or 'pattern'. According to them, 'the whole is more than the sum of its parts' e.g. a school auditorium+ students. This does not tell us if the students are in or out of the auditorium. The 'whole' also includes a quality that is enriched by dimensions, relationships, emotions and aesthetics. E.g. we do not know if the students prefer to be in the auditorium or outdoors on the playground. The psychologists discovered that the brain actually did follow a set of rules to combine and organize individual pieces or elements into a meaningful perception.

### **Rules (laws) / External Factors of Organization**

The e.g.s. given below are all visual, each law also applies to *audio, tactile, olfactory* modes.

**Figure and Ground**: It is the most fundamental gestalt principle. Our perception consists of two aspects, the figure which stands out with a definite shape and having more detail and the background which is less distinct. E.g. *Am I walking on just leaves and weeds or am I about to step on a rattlesnake?*

The figures are organized according to the following rules (write classroom examples in the space provided)

**Proximity**: This rule states that objects that are physically close together are grouped together.



We notice two groups of three black circles lie among the white.

- During a school assembly students standing in a straight line are assumed to belong to the same class.
- A group of students often seen together are considered to be friends.
- The rhythm in music is determined by the grouping of notes.

**Similarity**: things that appear similar or act in a similar fashion are grouped together.



There are groups of four circles in the four corners and a cross of squares.

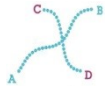
Students wearing the same type of uniform are assumed to belong to the same school. People who speak the same language are presumed to belong

**Closure:** It is the tendency to fill in any missing parts of a figure and see the figure as complete.



Teachers often tend to overlook spelling mistakes while reading because they know what the word is.

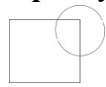
**Continuity:** Objects that continue a pattern are grouped together.



AB and CD are perceived as two separate lines.

It is easy to separate threads of different coloured when they are entangled.

**Simplicity:** This rule states that stimuli are organized in the simplest way possible.



We tend to see a square and a circle and not three different parts of the figure

**Contiguity:** When two events happen at a time and near each other, one is perceived as causing the other. E.g. the bell rings and students gather; the dog barks and a stranger stands in the doorway.

**Perceptual Constancy\*** is the tendency for the environment to be perceived as remaining the same even with change in sensory input. Although we are particularly alert to changes in our sensory input we also manage to perceive a great deal of consistency in the environment because of the principle of perceptual constancy. Without it our world would be totally chaotic. Things would seem to grow as we got closer to them, to change shape as our viewing angle changed, and to change colour as light levels changed.

**Size Constancy:** the process by which the perceived size of an object remains the same even though the size of the retinal image changes.

**Shape Constancy:** the process by which the perceived size of an object remains the same even though the shape of the retinal image of the object changes depending on the angle from which we look at it.

### **Internal Factors:**

1. **Influence of Past Experiences:** Previous experiences help us in organizing sense impressions into meaningful patterns. Hence richer the experience more varied would be the perception. E.g. we recognize an object even at a distance.

2. **Influence of Set Rules or Attitude:** Much of our perception depend upon the more specific subjective condition as the *set or attitude* which the individual has at a given moment. e.g. A snake could be perceived as a beautiful or a dangerous creature.

### **3. Interpretation**

After selectively sorting out the incoming sensory information and organizing it into patterns, the brain uses this information to make a judgment about the external world in a way that makes sense to us by using our existing information about the world. We then turn it into something that we can categorize. *For instance, in the Rubin Vase illusion mentioned earlier,*

*some individuals will interpret the sensory information as "vase", and some will interpret it as "faces".* However, this happens unconsciously to us thousands of times a day. We are constantly categorizing different stimuli so we can better understand and react to the world around us. This final stage of perception is called interpretation. Our interpretation or judgment is influenced by several factors including early life experiences, perceptual expectations, cultural factors and personal motivation and frame of reference.

**Illusion:**

Normally our perceptions agree with our sensations but there are times when they do not. This results in illusion. An illusion is a false perception. In an illusion the external stimulus is grossly misinterpreted. There is nothing wrong with the sensations but with the interpretation of these sensations. e.g. mirage

**Hallucinations:**

Hallucination is said to occur when a memory image and not sensation is taken for perception. e.g. seeing figures or hearing voices which do not exist.

**Educational Implications:** Dandekar, W.N., - *Fundamentals of Experimental Psychology*, pp18-19.

1. The percepts of children are not very rich because they do not have much experience of life. Hence teachers should provide a variety of experiences through a variety of instructional materials and activities.
2. While teaching the teacher should present matter by grouping it according to the various factors of organization i.e. proximity, similarity, continuity and familiarity.
3. The principle of Figure and Ground can be used in the teaching of a poem or a story where the central idea is presented clearly against a background.
4. Sense training should be emphasized at the lower classes so as to gain a good experience of estimation so as to help them understand the concept of length, breadth and height.
5. Students must be trained to develop a truly objective attitude which alone will give a proper objective. They should be made aware of the inner needs and prejudices that influence our perceptions of persons and the world through familiarity, bias misleading stimuli (illusion). They should be cautioned against being satisfied with a 'general impression' of what is observed around us rather than considering individual persons or events.

## Glossary

**Form Perception:** The process of organising the visual field into meaningful wholes.