

LEARNING THEORIES:

INSIGHT INTO THE MOVE TOWARDS OUTCOMES BASED EDUCATION

SESSION OUTCOMES:

- Participants will discuss and define the concepts of Learning, Knowledge and Teaching.
- Participants will demonstrate their understanding of various Learning Theories by making a list of descriptive words.

1. INTRODUCTION

We cannot dispute the fact that theories of any discipline are generally perceived with a sense of anxiety and disinterest. The main reason for this perception is that, more often than not, theories are expressed in difficult language. Thus their meaning is obscured by complicated jargon (technical lingo). It is therefore the aim of this module to dispel myths and fears about theories and learning theories in particular.

Learning theories form a distinct part of ***theoretical psychology***. In recent years, many psychologists have been dedicated to a study of learning theories. The interest shown by psychologists in this area is partially as a result of the interesting but complex nature of the concept of learning. In simple terms, psychologists are intrigued by how the mind acquires knowledge. It is only if we know how knowledge is acquired that we will be able to use appropriate teaching and learning methods in the classroom.

What is Learning?

Obviously, many researchers have attempted to define the concept of learning and no single definition can be said to be conclusive or correct. However, all attempts at a definition shed new light on the subject of learning. For example, according to Wakefield (1996: 364) learning can be described as a relatively permanent change in the behaviour of an individual based on his/her experiences or discoveries. Thus the processes of experience and discovery lead to a new understanding of the world and ourselves, and enable us to apply the acquired knowledge in new situations. Knowledge acquisition, then, involves processes that transform data from experience into organised information.

What is Knowledge?

The answer to this question seems obvious, but is it? Is knowledge something out there that we need to discover, or is it something that we construct? The answer depends on the perspective of the researcher. The researcher who believes that experimental methodology is the only true way of discovering knowledge will probably view knowledge as something that exists independently from humans. In this case knowledge will be perceived as something absolute and given. The problem with such an approach is that it may not satisfactorily explain much of human knowledge, thinking and reasoning. Bruning, Schraw and Ronning (1995:96) make a distinction between three types of knowledge namely, ***Declarative*** knowledge, ***Procedural*** knowledge and ***Metacognitive*** knowledge. Let us look at what they mean:

- **Declarative knowledge**, refers to factual knowledge.
- **Procedural knowledge**, refers to skills of doing things and how to execute activities.
- **Metacognitive knowledge** is about our awareness of how we think.

Furthermore, the knowledge that we have about a particular subject field is called ***domain knowledge***. Such domains are best thought of in terms of traditional subject areas like mathematics, biology, language etc. Domain knowledge includes declarative, procedural and metacognitive knowledge. Note that the study of the nature of knowledge is called ***epistemology***.

There are definitely no final answers to questions concerning learning and knowledge, and no theory can be found to be **absolutely** superior to others. Nevertheless, new discoveries take our understanding of the process¹ of learning to a new and refined level. Furthermore, through the study of learning theories and their historical development, teachers should gain insight into the harmonies and conflicts that prevail in present educational discourse. Through this insight, they will be able to provide sound educational reasons for what they do in the classroom.

It is not enough to talk about theory without giving careful consideration to its practical implications. The value of any learning theory lies in its 'clarification' (or intention thereof) of classroom practice. Thus an undercurrent of learning theories supports classroom practice at any given time. The point where theory and practice meet is generally referred to as **praxis**. This brings us to another question which is about teaching. If we can ask questions about learning then we can surely ask questions about teaching because the two processes take place almost simultaneously.

What is Teaching?

Like some of the questions posed thus far, we may be tempted to say that the answer is obvious and everybody knows what teaching is. But do we really understand what teaching is (and here we specifically mean classroom teaching)? Thick volumes of literature dealing with teaching exist, and it is not our intention to cover all of the important aspects raised in those works. But it is important that we touch on one or two aspects of teaching before we move on to the different learning theories.

If we consider what we have said about learning and knowledge then the role of the teacher is to help learners acquire both factual and skills knowledge, and to help them use their cognitive skills to solve problems. But even this does not provide us with a sufficient view of teaching since teaching is more than just the interaction between teacher and learner. Teaching can be thought of as consisting of three distinct aspects, namely, planning, interaction and assessment.

During the **planning** phase, teachers think about the outcomes of the interaction and the needs of the learners that they will be teaching so that they can design learning experiences and activities in which the learners will be involved.

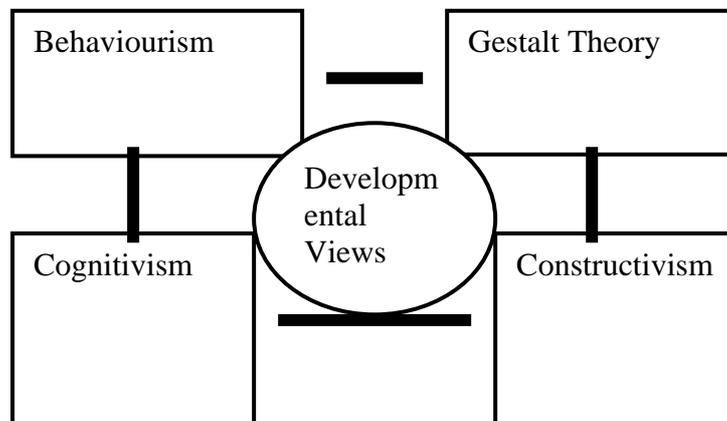
The teacher can generally include the following elements in his planning outcomes: instructional approach, declarative/procedural knowledge, learning materials, activities and assessment methods.

Interaction refers to what takes place between the teacher and the learners. Thus the learning situation should be structured in such a way that the interaction between the adult and learner will result in realising the learner's potential for cognitive development. Finally, teaching also implies that the teacher **assesses** each learning experience created with the aim of improving and developing strategies for assisting those learners who did not achieve the outcomes set. Assessment can be done during the learning experience or after. Let us look at the various learning theories.

¹ Note that there are learning theories which do not perceive learning as a process e.g. Behaviourism.

2. LEARNING THEORIES

For the purposes of this manual we focus on the so-called modern learning theories namely, Behaviourism, Gestalt theory, Cognitivism and Constructivism.



Behaviourism

In the nineteenth century, Charles Darwin published his well-known work, *The Origin of Species*. Scientists soon realised that although humans may differ in many ways from other members of the animal kingdom, they do (at least as far as biological aspects are concerned) share many similarities with them. Studying biological processes in animals could therefore shed some light on the same processes in humans. Scientists interested in psychological processes soon followed the trend.

Thorndike

Around the turn of the twentieth century, Edward Thorndike attempted to develop an objective experimental method to study the behaviour of cats and dogs. He designed a so-called 'puzzle box' in which an animal was placed. Each puzzle box had a lever or mechanism that would release the door lock if the lever or mechanism was pressed. The animal had to learn to press the lever or mechanism to open the box.

Thorndike noticed that he could measure animal intelligence by using this equipment. He was particularly interested in discovering whether animals could learn through imitation or observation.

He noticed that when an animal found itself in a problem situation it had encountered before, it was more likely to perform the same action that had earlier brought the desired reward.

The reward of being freed from the box strengthened the association between the stimulus (being placed in a closed box) and an appropriate action. Thorndike concluded that rewards act to strengthen stimulus-response associations. This basic principle he applied to humans by claiming that humans develop a myriad of stimulus-response associations.



Watson

JB Watson continued the experimental work along the same lines. He was familiar with the **classical conditioning** work of the Russian physiologist, Ivan Pavlov. Pavlov's research on dogs revealed that certain behaviour (responses) in dogs could be made into a habit. Watson believed that classical conditioning is the key mechanism underlying all human learning.

Consider, for example, the child who refuses to go to school in the morning. Who taught the child to behave in this way? Possibly, a bully scared the child and instilled fear in him/her. The child linked going to school with the bully and therefore going to school became a frightening experience to him/her. The result is that whenever school time comes, the child becomes unruly and scared. Watson saw these 'built in' (conditioned) behaviours everywhere.

Skinner

In the 1930s, BF Skinner did a lot of research on laboratory rats and pigeons. He found that he could change the behaviour of his laboratory animals in startling ways just by the judicious use of rewards. In one of his famous experiments he taught a pigeon to dance by using rewards. What he found in the laboratory, he applied to human learning.

He was confident that the mechanism of reinforcement (reward) of responses (Operant behaviour) was at work everywhere in all types of learning. Skinner (1996:6) wrote: "While we are awake, we act upon the environment constantly, and many of the consequences of our actions are reinforcing." Contrary to Watson, who focused on the stimulus that produced a response, Skinner focused on the behaviour (or Operant) and how it was reinforced.

Criticism of Behaviourism

Behaviourism is unbelievably simple in its assumption that a single mechanism like conditioning is responsible for learning. Seemingly, behaviourism does not take mental processes of learning into consideration. Some of the criticism of behaviourism relates to the following:

- Behaviourism views learning as something that happens to a person, with the person being passive. We all know that every learner is active, both mentally and physically, when engaged in learning.
- Behaviourism does not account for all types of learning, since it disregards the activities of the mind. What goes on inside the mind of a person is of extreme importance in understanding the learning processes.
- Behaviourism does not explain some forms of learning such as the recognition of new language patterns by young children.

Gestalt Theory

The Gestalt theory was to a great extent propagated by Köhler, Koffka and Wertheimer. This theory emphasised higher-order cognitive processes in the midst of behaviourism. Gestalt psychologists argued that we do not experience the world in simple, small chunks of information that enter our minds and are later combined into

complex ideas. Gestalt theory claimed that we experience the world in meaningful patterns or as an organised whole. Thus knowledge is organised to solve a problem and therefore we should view learning from the perspective of problem solving.

Gestalt theory postulates that knowledge is grouped into elements according to the following principles: proximity, similarity/differentiation, closure and simplicity.

- **Proximity:** this means that we tend to group elements according to their nearness to one another and the patterns that they form.
- **Similarity:** this implies that we tend to group together items that are similar in some respect. Obviously by drawing similarities learners are at the same time drawing distinctions between items.
- **Closure:** which means that we tend to group items together if they seem to complete some entity.
- **Simplicity:** stronger or more adequate patterns tend to dominate weaker patterns in perception. We organise items into simple figures according to symmetry, regularity and smoothness if they are dominant.

These principles are called the laws of organisation and are used in the context of explaining perception and problem-solving.

Köhler

Köhler (1887-1967) deviated from the experiential approaches used by behaviourist psychologists in studying learning. He designed a series of problem situations for the chimpanzees that he was working with. In each case all the elements that were needed to solve the problem were available to the animals. By observing how the chimpanzees went about solving the problems, he reached the conclusion that learning took place through an act of **insight**.

Wertheimer

Wertheimer (1959) provides a gestalt interpretation of problem-solving episodes of famous scientists (for example, Galileo and Einstein), as well as children presented with mathematical problems. The essence of successful problem-solving behaviour according to Wertheimer is being able to see the **overall structure of the problem**.

Cognitivism

The cognitive view of learning, like the behaviourist view, **sees knowledge as given and absolute**. Many of the information processing models of teaching and learning are based on the cognitive view of learning. Also note that some of the theorists discussed so far can be classified as either behaviourist or cognitivist. This is so because of the close relationship between certain of the ideas connected to memorisation.

Piaget

Jean Piaget (1896-1980) was a psychologist and a pioneer in the study of child intelligence. His early studies in biology, and specifically evolution, influenced his approach to human learning. He believed that the human capacity to think and learn was an adaptive feature that enabled humans to deal effectively with the

environment. Contrary to the behaviourists and gestalt psychologists, Piaget did not study animals, but small children.

Piaget's research in developmental psychology centred on the question of how knowledge develops in the mind. Piaget approached the problems of thinking and learning by focusing on the mental and cognitive processes that make them possible. This focus became the defining element of the cognitivist theory. According to Piaget, children shape their own conceptions of reality through continuous interaction with their environment. Cognitive development therefore occurs as children adapt to their environment, thus building their sense of reality.

Piaget regarded knowledge growth as something that happens continually in a sequential process consisting of logically embedded structures (**schemata**) succeeding one another throughout an individual's lifetime. This is divided into **stages** of development and children move from one stage to the next by maturation and exploration.

Piaget identified the following developmental stages:

- **The sensorimotor stage:** For the first year and a half to two years of life, infants are only aware of sensorimotor experiences. Thus they do not know how things will react, and so are always experimenting-shaking things, putting them in their mouths, or throwing them. In this way, they learn to co-ordinate their physical movements. Their learning is mainly by trial and error.
- **The preoperational stage:** This is a stage from around 18-24 months to 7 years, when children can think about things in symbolic terms. They can pretend, verbalise, and understand past and future. However, cause-and-effect, time, comparison, and other complex ideas are still out of reach. The child is still not able to construct abstract ideas and to operate on them solely in the mind. The child works with the concrete, physical situation in front of him/her.
- **The concrete operational stage:** From 7-12 years, children gain new competencies in thinking and become involved in events outside of their lives. The child is finally able to start to conceptualise things after a great deal of physical experimentation with objects. The child can do subtraction, multiplication, division, and addition of numbers, not just things. However, the ability to tackle a problem with several variables in a systematic way is unusual at this stage.
- **The formal operational stage:** From 12 years old and so on, learners are able to think about abstract relationships (as in algebra), understand methodology, formulate hypotheses, and think about possibilities and abstractions like justice.

Piaget outlined several principles for building cognitive structures. During all developmental stages, the child experiences his/her environment using whatever mental maps he/she has constructed so far. If the experience is a repeat one, it fits easily into the child's cognitive structure (that is it is **assimilated** into the existing cognitive structure) so that the child maintains mental **equilibrium**. If the experience is different or new, the child loses equilibrium (hence **disequilibrium**), and alters

his/her cognitive structure to **accommodate** the new conditions. In this way, the child builds more and more adequate cognitive structures.

Constructivism

The constructivist view of learning assumes different forms just like the aforementioned theories.? In essence, constructivist theories see **knowledge as a constructed entity**. This view of knowledge contradicts the view that knowledge is given and absolute. The constructivist approach is based on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Thus individuals use their own mental constructs to make sense of their experiences.

The following are some of the basic principles of constructivism:

- Learning is a search for **meaning**. Therefore, learning must be based on the issues that require personal interpretation.
- The construction of meaning requires an understanding of '**wholes**' (the bigger picture) as well as **parts**, and parts must be understood in the **context** of wholes. Therefore, the learning process focuses on primary concepts, not on isolated facts.
- Emphasis is placed on the **application of knowledge** as opposed to a mere acquisition of decontextualised facts.
- **Social aspects** of learning form a crucial part of the constructivist view of learning. This means that people also learn from one another and not only in isolation from others.

Vygotsky

Lev Vygotsky (1896-1934), a Soviet psychologist, was convinced that social interaction plays a fundamental role in the development of cognition. According to him **culture** was a determinant of individual development. Humans are the only species to have cultures, and every human child develops in the context of a culture. Therefore, human cognitive development is affected to a larger or lesser extent by the culture in which individuals are enmeshed, including family environments.

According to Vygotsky, culture seems to make two kinds of contributions to children's intellectual development. Firstly, children acquire much of the content of their thinking (cognition) from it and, secondly, they acquire the processes or means of their thinking from it. In short, culture teaches children both what to think and how to think. In this way, children are very likely to model their behaviour on the observed behaviour of their parents. Learning is therefore dependent on **social interaction**.

One of the notable aspects of learning that Vygotsky highlighted was that a child learns better with the help of an adult. He did not assign much importance to the stages of development of a child (like Piaget did), but was more interested in the potential for cognitive development. This, he believed, is limited to a certain time span which he called the '**zone of proximal development**' (ZPD). At any given time in a child's development, he/she will be more susceptible to certain new knowledge. Obviously, if new knowledge is not forthcoming then the child would have probably reached the highest point of his/her knowledge. In order for the child to increase his knowledge, then an adult (for example a teacher) would have to **scaffold** a child to new heights of knowledge in a particular domain.

Bruner

Bruner's theory linked to child development research as he worked with children in a manner similar to Piaget. Bruner identified the following three stages of development:

- The **enactive** stage, in which the child understands the environment through physical manipulation and handling of objects-holding, moving, touching, and biting.
- The **iconic** stage, in which information is carried by imagery-visual memory is developed but the child still bases his/her decisions on sensory impressions.
- The **symbolic** stage, in which the child is able to convey meaning through symbols-he/she is able to understand and interpret idiomatic expressions (like 'too many cooks spoil the broth') and use formulas to solve problems.

Bruner believes that learning situations should be structured to enable the learner to learn. He recognises the futility of trying to know everything, but insists that we should all acquire a rich conceptual framework (the 'bigger picture'). As far as teaching is concerned, the educator should try and encourage learners to discover principles by themselves and to develop the 'big picture'.

3. SUMMARY

	BEHAVIOURIST	COGNITIVIST	CONSTRUCTIVIST
Knowledge is:	Passive, largely automatic responses to external factors in the environment	Abstract symbolic representations in the mind of individuals	A constructed entity made by each individual through the learning process
Learning is:	A relative permanent change in behaviour	A change in a learner's understanding	Discovery and construction of meaning
Focus of learning is on:	Association, operant behaviour, conditioning	Increased meaning and improved memorisation	Problem-solving and construction of meaning
Key learning concept:	Reinforcement and programmed learning	Elaboration	Intrinsic motivation
Centred on:	Teacher	learner	learner

NB: In the summary above, the Gestalt Theory is subsumed in the behaviourist theory.

REFLECTION

Which learning theories does my classroom reflect most of the time?

4. LIST OF REFERENCES

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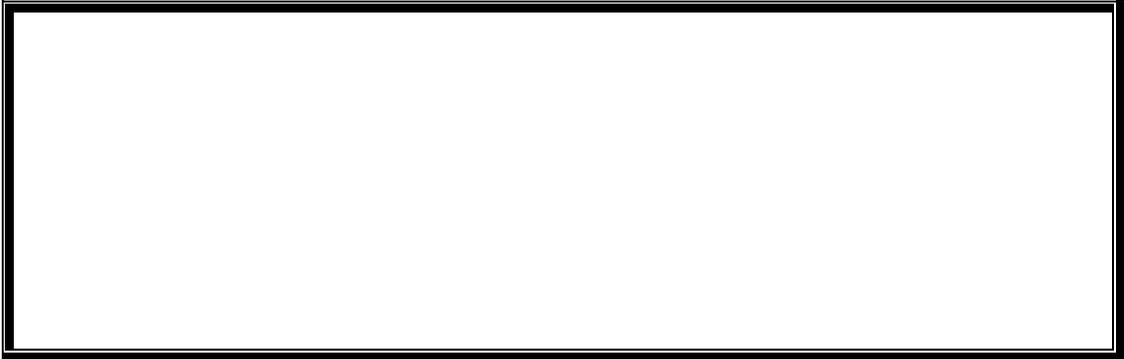
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5. ACTIVITIES

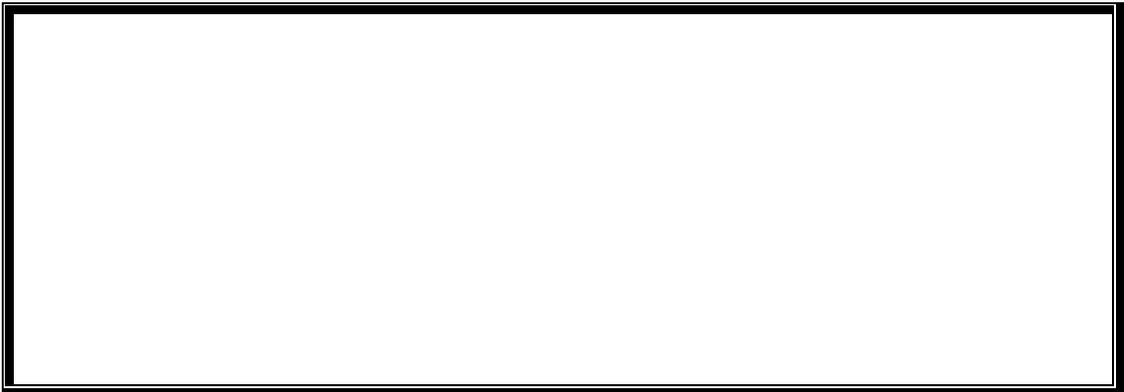
INTRODUCTION

DISCUSS AND ANSWER THE FOLLOWING QUESTIONS IN A GROUP:

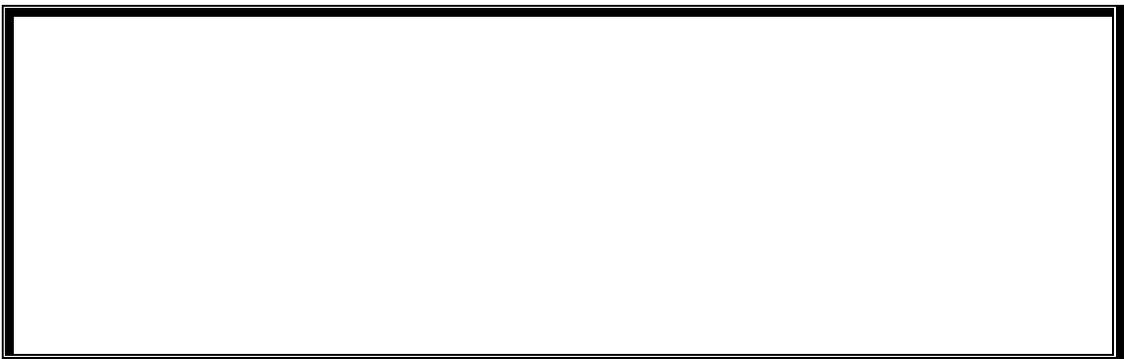
WHAT IS LEARNING? (5 MINUTES)



WHAT IS KNOWLEDGE? (5 MINUTES)



WHAT IS TEACHING? (5 MINUTES)



LEARNING THEORIES

WHICH LEARNING THEORIES DO YOU KNOW AND WHAT DO YOU REMEMBER ABOUT THEM? (2-3 MINUTES)



**WHY IS IT IMPORTANT FOR TEACHERS TO KNOW LEARNING THEORIES?
IS IT IMPORTANT AT ALL? (2-4 MINUTES)**



MAKE A LIST OF WORDS THAT BEST DESCRIBE THE LEARNING THEORIES COVERED IN THE MANUAL: (REFER TO THE MANUAL)

**WHY IS CONSTRUCTIVISM SUITABLE FOR OUR EDUCATION SYSTEM?
REFER TO THE MANUAL.**

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