UNIT 19   CONSTRUCTIVISM

Structure

19.1   INTRODUCTION

You may do well by revisiting the doctrines of behaviourism and cognitivism, studied earlier in this block, to begin the study of constructivism.

What are the assumptions made by behaviourism and cognitivism about the nature of knowledge? Both regard knowledge as static, absolute and final and believe it to exist independent of the learner. So knowledge about the world is preexisting, reliable and constant, and the function of learning and cognition is to gain this knowledge. There is this 'given world of knowledge', and that is what teachers and learners need to be concerned with. In such an instructional model of knowledge, the role of the learner is the acquisition of this fixed world of knowledge, and the role of the teacher is to dispense and transmit this to the learners.

Constructivism holds sharply opposite views about the nature of knowledge. The assumptions made in behaviourism and cognitivism about the nature of knowledge are not acceptable to constructivists. Its assumption about knowledge is the most distinguishing characteristics of constructivism. As a theory of knowledge, constructivism rejects a static, passive or fixed view of knowledge and refuses to accord it an objective value. You can say that constructivism rejects absolutist epistemology, which is the basis of both behaviorist and cognitivist theories of learning.

This does not mean that constructivism can be conceptualized solely in terms of its theory of knowledge. On the contrary constructivism is quite difficult to describe, as it does not refer to any one theory, model, concept or approach, but is akin to a broad label. It accommodates a range of positions and has several versions, some of which

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we shall study later in this unit. Not only does it not stand for any one /single approach, theory or position but denotes a broad intellectual tradition that privileges multiplicity. There is thus no standardized definition, meaning or description that can be given to it. One can go as far as to say that one's understanding of constructivism is dependent on the theorist, educator or researcher one is reading about.

Do you now understand why constructivism has been introduced in this unit by comparing it with behaviorism and cognitivism, rather than by an attempt to define or conceptualize it independently? It is a theory of knowledge and has far reaching implications for learning, pedagogy, assessment and educational practice. We will, thus, be concerned in this unit not only with understanding constructivism but also its educational implications. It is not in the traditional sense of the term a 'learning theory', as it does not propose a theory of learning, even though one comes across the term constructivist learning theory in the literature on constructivism.

We conclude this introductory discussion regarding what constructivism is not and the numerous interpretations that it has, by moving on finally to the question what constructivism is.

19.2   OBJECTIVES

After going through this unit, you should be able to:

● describe construcivism as a concept;

● compare different definitions of constructivism;

● enunciate different principles of constructivism in educational theory and practice;

● distinguish between different types of constructivism;

● differentiate between objectivism and constructivism;

● identify the constructivist features of concepts in cognitive psychology;

● draw implications of constructivism for education;

● identify the constructivist conditions of learning in schools; and

● visualize how to become a constructivist teacher.

19.3   THE IDEA OF CONSTRUCTIVISM

Constructivism has emerged as an influential doctrine in education in the last two decades. As an area of study it has roots in multiple disciplines, like philosophy, psychology, sociology, education, cognitive science and cybernetics. Its earliest votary was an Italian philosopher Giambattista Vico, (1668-1744), who proposed a constructivist theory of knowledge in which he regarded knowledge purely as a byproduct of human construction. This is evident in his words that " The known is the made." Since then many theorists and researchers have formulated different ideas about constructivism. Today constructivism, as an epistemological orientation, is embraced by researchers and practitioners in diverse fields ranging from science education, educational psychology, sociology of knowledge, mathematics education to instructional technology. You need not be surprised to discover that it is not only students of education like you who are studying this topic, but even those who study subjects like psychology, sociology, philosophy, anthropology and information technology, are also exploring the field. As already stated, constructivism is not a unitary construct. There is considerable debate indeed among educators, philosophers, psychologists and researchers about what it entails. With this background let us now try to understand what it means.

Constructivism is centered on the idea that human knowledge and learning is actively constructed by the learner, not passively received from the environment. Knowledge is always someone's knowledge. It is created or constructed by the experiencing individual. It is not impersonal or absolute. How do learners actively build or 'construct' this new knowledge? They do this on the bedrock of their prior knowledge. Learners in a classroom have their individual experiences and a cognitive structure, which are built on those prior experiences.

As an illustration of the above let us consider a school going child who resides in a rural habitation adjoining a river. The child has never left the village, nor ever crossed the river, nor does she think that it is possible to do so. The teacher in the school teaches him/her that there is a vast body of water (ocean) that surrounds the earth. However what he/she learns and comes to believe is that the river is the ocean and there is no earth beyond the river. Whenever a reference is made about the earth and universe, or even if the globe is shown to him/her, the child draws upon his/her own personal construct of the earth. So knowledge construction has taken place on the basis of his/her earlier experience of the world and is, in fact, a misconception. As such the misconception cannot be accepted as 'valid knowledge' as it is in contradiction to it. Valid knowledge is defined by the concerned community of practice, which in this case is the community of geographers. For the learner, his/her knowledge construct is a viable one, as it suffices the purpose of organizing his/her experiences of the world. For the teacher, this knowledge construct is unacceptable as it falls way short of what can be regarded as 'valid knowledge.' Not only does it fall short but is as a matter of fact, in opposition to it, as the village alone is not the earth but only a part of it. Mental Model of the earth is formed by the child by fitting the new information into his/her existing mental model. These mental models are quite stable and resistant to change. Can you recall now some of your own childhood experiences and memories?

Children tend to develop interesting and unique concepts not only about physical phenomenon such as the one explained above, but even about the social world. Children who have seen only men in short hair and trousers, which is often the case in rural Indian societies, on seeing women in the same attire, refer to them as 'uncle.' They have constructed a concept of uncle (men) on the basis of certain characteristics. Even though they may be told that this is not uncle but auntie, and even if they seemingly accept what they are told, they may not necessarily believe in it. They may use the word auntie but continue to hold on to their earlier constructs. Our daily life experiences are replete with such instances. How about exploring some such interesting ideas among children around you?

It is not difficult to understand the idea of non-congruence between knowledge and reality, as the main function of the knowledge constructs is to organize the ongoing experiences of the learner and not mirror reality. The learner tends to reformulate his/her existing structures/ constructs by connecting them to the new experiences of the world. This is what we mean when we say that in a constructivist setting, knowledge is not objective. Susan Hanley of Maryland Collaborative for Teacher Preparation, University of Maryland, gave an example of such view of knowledge. She noted that "Mathematics and science are viewed as systems with models that describe how the world might be rather than how it is. These models derive their validity not from their accuracy in describing the real world, but from the accuracy of any predictions which might be based on them."

Knowledge involves mental constructs that are constructed from past experience. Whether these constructs / structures are valid, truthful or incomplete is not important. The truth content of this knowledge is insignificant. If the known is the made, there is no singular, universal absolute knowledge; if reality is pluralistic, then it is meaningless to search for or debate about what the truth is. The truthfulness of a statement has to be judged vis-a-vis the point of reference on which it is based. If a child conceptualizes a bus as a big car or a goat as a dog, he/she is doing so on the basis of some criteria.

If we adopt their criteria or view their constructions in line with their viewpoints or referents, then we may not find any flaw in the above-mentioned statements. Discrepancy arises only when we use our criteria to evaluate their constructions. This is not to say that children do not learn 'approved' knowledge. They do so when they adopt culturally accepted criterion. As far as the personal constructions are concerned, reality is pluralistic and there can be no single truth. When society or culture presents to the child their standpoint, reality becomes consensual, yet it may vary from culture to culture, community to community. Thus individual constructs about the same phenomenon although logically consistent, may differ from one another. Such differences may be reduced through social persuasion or growing experiences, resulting in shared understanding among the members of a community. Further, when communities come together and arrive at a larger consensus, knowledge becomes increasingly consensual (universal as far as this world is concerned).

19.3.1 Constructivism: Some Definitions

In the words of Vico (1710) "We can know nothing that we have not made."

According to Van Glasersfeld (1989) constructivism is based on the belief that "knowledge is not passively received but actively built up by the cognizing subject and the function of cognition is adaptive....and serves the organization of the experiential world, not the discovery of ontological reality."

In the words of Martin Dougiamas (1998), a student of science education at Curtin University of Technology on Internet Technologies, Australia, observed:

"Constructivism is building on knowledge known by the student. Education is student-centered; students have to construct knowledge themselves. Explanations can use metacognition to explain via metaphor. Semiotics, or meanings of words, are important to keep in mind. Constructivism is a theory, a tool, a lens for examining educational practices."

Bruner defines constructivism as a learning theory in which learning is seen as an active process in which learners construct new ideas or concepts based upon their current and past knowledge (Kearsley, 1999).

As evident from these definitions, there is difference in how these four scholars belonging to constructivist tradition conceptualize constructivism, since originally they belonged to different disciplinary domains. Vico and Glasersfeld are philosophers, Dougiamas is an Information Technologist and Bruner is an educator. This sampling of constructivist theorists is not meant to be exhaustive but should illustrate to you the diversity of the field of constructivism. We hope that you have not failed to notice that there is no fundamental incompatibility between their ideas.

One can thus surmise that notwithstanding the various versions and interpretations, some common ideas, concepts and principles surface across constructivist theories. Let us examine them in greater detail, in the next section.

19.3.2 Principles of Constructivism

Two main ideas that can be termed as the principles of constructivism are as follows:

● The learner is not a passive entity but an active cognizing subject. He/she plays an important role in learning and development of knowledge. Knowledge is not passively received or absorbed by the learner but actively built by him/her. What more this implies is that knowledge cannot be transmitted from one learner to another. Learners have to construct this knowledge themselves.

● The function of cognition is not the discovery/representation of the world but adaptation. That is to say that cognition performs the function of organizing the learner's experiences of the world. Reality and truth are not the important notions

related to knowledge. What is of significance is that the learner constructs a viable explanation of his/her experiences. It is not important whether these explanations are factually correct or mirror the reality, but rather that they are self-constructed by the individuals. The goal of cognition is thus not the representation of an objective independent reality but our own attempt to understand and organize it. In order to do so we create a version of it by our own selves. This is the process of construction of knowledge.

Check Your Progress 1

Note: Write your answers in the space given below.

1) How does constructivism differ from behaviorism and cognitivism in terms of its assumptions about the nature of knowledge?

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2) Rewrite any one definition of constructivism proposed by any theorist in your own words.

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3) Explain in your own words what you understand from the notion of constructivism.

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4) As a student of education, are you attracted to the doctrine of constructivism? If yes, why?

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19.4 CONSTRUCTIVISM IN EDUCATIONAL THEORY AND PRACTICE

Over the last two decades, constructivism has become increasingly acceptable as a perspective in education. Not only is it becoming acceptable but is also gaining popularity. More and more scholars, researchers, educators and educational administrators are following the constructivist approach. Mainstream literature in educational psychology is according larger space to it. In most texts, introductory or advanced, you will find a full chapter or even a unit devoted to it. There is also an upsurge of interest in its implications for education. Teachers and school administrators increasingly embrace constructivist practices inside and out of the classroom. We shall study some of the implications of constructivism for education in a separate section later.

. Some of the reasons that have fuelled the popularity of constructivism are the following:

- Educators are increasingly rejecting the philosophical basis of behaviourism. The assumption of the passive learner is especially unacceptable. Almost all the contemporary writers on education regard children as active and inherently educable. The dominant modern view of child nature is completely opposite of behaviourism. With increasing disenchantment with behaviorism, constructivism offers a refreshingly contrasting alternative.

- Children's knowledge often involves systematic errors and misconceptions. Constructivism alone accounts for their formation. The formation of personal constructs, misconceptions and errors will become obvious to you, as you will study about Radical Constructivism in the forthcoming section.

- It explains variability in meaning, perception and understanding that learners attach to objects and events.

- In philosophy of science, doubts have developed about the accessibility of objective reality in the area of modern physics. If objective reality is not knowable even in an area as objective as physics, then the constructivist skepticism of objective knowledge is well founded.

- Constructivist theory is compatible with the interactional and cultural emphasis of theorists like Vygotsky and Bruner.

19.5 TYPES OF CONSTRUCTIVISM

The parameters on the basis of which various versions of constructivism can be distinguished from each other are many. This is understandable in view of the loose and broad nature of the doctrine of constructivism. It can be therefore labeled in a variety of ways giving rise to many types of constructivism some of which we are now going to study.

By far the most popular classification of constructivism is done by using a continuum ranging from weak to strong. The weak form is titled as **trivial constructivism**, and the strong form at the other end of the line is termed as **radical constructivism**. To understand these two types of constructivism we will return-to the two principles of constructivism that we studied in the last section. Briefly stated again, the first principle assumes that the learner is an active rather than a passive being, while the second considers the function of cognition as adaptation rather than representation.

19.5.1 Trivial Constructivism

Von Glasersfeld first coined this term in 1990 calling it the simplest type of constructivism. One can say that **trivial constructivism** is contained in all other types of constructivism, which will become obvious to you as you proceed in this section. It also parallels the argument of **personal constructivism** that we will discuss later in this section.

Trivial constructivism agrees only with the first of the two main principles of constructivism, that is, the learner is an active player in the process of construction of knowledge. Its central idea is that learners themselves construct mental structures on the basis of what they already know. Learning is not just passive absorption of information but active construction by the learner. New knowledge is actively constructed on the foundation of prior knowledge by the action of an active learner upon the world. Knowledge is thus never impersonal, as it is always someone's knowledge. Of course that someone is the learner. That is what we mean when we say that knowledge is not independent of the learner. It is also learner dependent in the sense that new knowledge is built on the basis of what the learner already knows.

It does not dismiss the objective reality of the environment but believes that this reality is knowable by the learner through the process of personal construction. The purpose of learning and cognition is construction of mental structures that mirror this reality. As a result of cognitive development the learner made constructions become better and better representations of this reality of the environment.

The Information Processing theory can be regarded as one of the weakest forms of constructivism. It is constructivist as it views learning as an active process in which the learner's thought processes are engaged. Not only the learner's thought processes are involved but even emphasized, as the learner is endowed with the capacity for thinking, problem solving and going beyond the information given. Glasersfeld even regards the theory of Jean Piaget, as a case of trivial constructivism.

Our formal system of education can also be regarded as an instance of trivial constructivism. The knowledge that it seeks to disseminate or the information that it transmits is fixed - given. This given (curriculum) is a piece of a larger body of knowledge that corresponds to an objective, singular, knowable part of reality and therefore every learner is expected to learn the 'same knowledge'. It is further believed that certain cognitive processes such as comparison, analysis, synthesis etc will help in constructing knowledge, which will ultimately approximate the accepted form or validated knowledge. The trivial constructivists do not deny that different individuals make different constructions using different cognitive processes, but they largely attribute these differences to variety of experiences. Thus the differences in constructions can be reconciled by providing learners with appropriate experiences with a view to enable them to construct `valid knowledge'.

19.5.2   Radical Constructivism

This complex and difficult to describe notion is well summarized in the words of its most ardent advocate Glasersfeld (1990), who wrote, "Coming to know is a process of dynamic adaptation towards viable interpretations of experience. The learner does not necessarily construct knowledge of a 'real' world."

Radical constructivism does not deny the objective reality, but considers it unimportant. According to Glasersfeld we do not even have a way of knowing this objective reality. It is colored by the lenses of the learner's eyes by way of his /her experiences. It does not even matter if this perceived reality is a representation of objective reality, as the function of learning and cognition is not to correctly represent the objective world. The function of learning and cognition is adaptation, that is, the construction of viable explanations of the experiences of the learner. These constructions help to impose an order on the learner's flow of continuing experiences in the world.

By now it may be evident to you from this discussion that radical constructivism follows both the principles of constructivism, the first of the active learner and the second that regards adaptation as in function of learning and cognition, by virtue of which the place of truth in knowledge is given to viability. You may also realize how necessary it was to recall the two principles of constructivism at the beginning of this section, as these served as a criterion for conceptualizing these two major types of constructivism. Conversely, the classification of constructivism as trivial and radical helps us better understand the two main features of constructivism. Let us conclude by stating that the critical difference between trivial and radical constructivism is with regards to the general function of cognition, which both conceptualize differently, while both emphasize the active role of individual learner as the constructor.

19.5.3   Personal and Social Constructivism

This is another significant dimension along which constructivism can be classified depending on whether knowledge is regarded as an individual or a social construct even though the process in both cases is subjective. Personal and social constructivism

are accordingly conceptualized as two types of constructivism. The former regards knowledge construction as an individual process, while the latter puts emphasis on the social environment or the context in which the learner is situated and constructs knowledge.

Personal Constructivism

Theorists and researchers located in this position can often be identified by the fact that they call themselves as constructivist and not social constructivist. So what are the identifying features of this version of constructivism? As evident from the title it regards the individual learner as the constructor of knowledge and prioritizes the individual aspects of learning. Learning and cognitive development involve individual sense making in an experiential world.

A celebrated example of this is the great psychologist Piaget's theory that is generally called genetic epistemology, which you have studied earlier. It explains learning and cognitive development in terms of structures like individual schema and mental processes like organization and adaptation (assimilation and accommodation). The learner with the help of these structures and processes constructs knowledge himself/herself. So the learner though active is alone in this process of knowledge construction. You will now agree that such a theory about learning and cognitive development, one that accords primary place to individual structures, processes and constructs, is a type of personal constuctivism. In the words of Piaget (1980) himself " Education, for most people, means trying to lead the child to resemble the typical adult of his society (whereas) for me, education means making creators, even if there aren't many of them, even if one's creations are limited by comparison with those of others."

Social Constructivism

Social constructivism is founded on the thesis that social processes are central to learning and cognitive development. It regards knowledge as a social construct and prioritizes the social aspects of learning and cognitive development. Some of these social aspects are language, culture, everyday practices, material objects, interpersonal interaction, peer interaction, tools and symbols. Though the concept originated in sociology and philosophy, it has become increasingly popular in education in the last two decades. Though there is no consensus as to what it stands for; in educational theory and studies the social constructivist tradition is dominated by the legacy of L.Vygotsky. The ideas of American educator J. Bruner have also contributed to its heritage in recent years.

Social Constructivism centers around the idea that the culture is a constituent of mind and therefore provides for structures which determine the construction of reality. In this sense, no knowledge constructions are asocial or acultural. The learner appropriates and constructs meanings in response to his or her experiences in the social contexts. Cognition is socially situated and knowledge construction is a social activity rather than an individual enterprise, an outcome of the dialectical relationship between the individual and the social context. The primary origin of knowledge is not in the learner's interaction or action upon the objective world as is believed in personal constructivism. Knowledge and knowing are not acultural entities unaffected by sociological contingencies. Knowledge originates in the social and material history of the culture to which the learner belongs. Mental processes including higher cognitive skills have social origins. Learning, cognition and cognitive development cannot be understood without going outside the individual, to the social and cultural processes from which they originate. Learning and cognition do not begin within the individual, but occur between individuals; that is to say that they take place on an intermental rather than intramental plane. It is from this intermental plane that mental processes are internalised by individuals. Learning and development occur as a result of this internalization from outside, in a process, which is intersubjective. In order to understand how children construct knowledge we need to examine the tools of culture. The cultural tools are

both, physical and psychological. The implements used for farming, the vehicles used for transport, machines used for various purposes, computers etc. are part of physical tools. Culture invents these tools in order to deal with the situations and overcome the limits imposed upon us by our biology.

Telescopes, microscopes hearing- aids, spectacles etc. are all examples of physical tools. On the other hand, language, sign systems, sign language, religious systems, legal systems, social institutions, different art forms or modes of creative expressions, folklore constitute the psychological tools. There are set (shared) ways of thinking, learning and teaching in a given culture. These are all part of psychological tools. The social constructivists firmly believe that humans interact with the physical world only through cultural tools. Thus all knowledge is mediated and constructed essentially through these tools. The social constructivists do not separate mind from culture. To them learning is a social process involving the learner, the culture and the members of the society. The manner in which children of a culture are initiated into it, especially into its knowledge system also needs to be considered. Sociocultural theorist Lave (1988) conceptualized cognition as " complex social phenomenon.....distributed-stretched over, not divided among - mind, body, activity, and culturally organized settings (which include other actors)."

To conclude we can say that social constructivism believes that the locus of knowledge is not in the individual but in society; learning and cognition are inherently social; and that cultural activities, tools and symbol systems play critical role in learning and cognitive development.

19.5.4 Objectivism and Constructivism

Constructivism is often contrasted with objectivism as if the two were the opposite ends of a line. Objectivism is based on the belief that knowledge should correspond to reality. The objectivist seeks to define knowledge as a representation of the reality of the world. The real world in turn is regarded as absolute, static, objective and independent of the learner. Knowledge is to be regarded as knowledge, only if it is a truthful mirror of the world. It is thus based on the objective reality of the world and is not dependent on the learner. Knowledge is thus conceptualized as objective and independent of the learner.

Constructivism holds extremely opposite views about knowledge. To the constructivist knowledge is not absolute, static, objective or learner independent. As discussed earlier in this section, constructivism regards knowledge as part and parcel of the learner and his/her experiences with the environment. It dismisses the notion of objectivity in knowledge, as knowledge is not supposed to match or discover reality. There is no need for it to correspond to a knowable, external reality or to be a truthful representation of it. Truth has little role, if any, to play in the conceptualization of knowledge. The notion of truth is replaced by viability in the conceptualization of knowledge. What viability implies is that the constructed knowledge should enable adaptation, that is, allows the learner to organize the experiential world.

Check Your Progress 2

Note: Write your answers in the space given below.

1) Employing the two principles of constructivism, distinguish between trivial and radical constructivism.

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2) Cite a significant commonality between Personal and Social Constructivism.

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3) Write an example that illustrates how social construction of knowledge takes place.

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4) Can the terms behaviorism and objectivism be used synonymously? If not, why? Will you agree with the statement that behaviorism has emerged from the objectivist tradition?

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19.6 CONSTRUCTIVIST FEATURES OF CONCEPTS IN COGNITIVE PSYCHOLOGY

Two areas of study in mainstream cognitive psychology that appear to be quite 'learner independent' are perception and memory. In the following paragraphs we explain how even perception and memory can be conceptualized in a constructivist approach.

- The General Theory of Perception proposes that the learner's perception of the world involves not a passive reception / taking in of stimulation, but an active process of sense making and interpretation. The learner's prior knowledge, expectations and learning play an important role in this process of making perceptual sense of the world.

- F.C.Bartlett views memory as a process of reconstruction from the stored traces of previous experiences. This process of reconstruction is not different than a construction, as it involves drawing meaning from stimuli in the environment, on the basis of which this reconstruction takes place. So even memory can be regarded as a construction.

19.7 IMPLICATIONS OF CONSTRUCTIVISM FOR EDUCATION

Constructivism has important and far-reaching implications for educational theory and practice. In the previous sections we have examined some of the theoretical dimensions of constructivism. In the present section we will consider the main practice related implications of constructivist principles for learning and pedagogy. We will also outline the constructivist conditions of learning and the roles that constructivism accords to the teacher and the learner.

The main features of a constructivist approach to learning and pedagogy are the following:

i) The constructivist epistemology rejects a transmission model of knowledge. Consequently education is not based on the view that there is a fixed world of knowledge, transmitting of which to the learners, is the goal of education. Teaching and learning are not like the pipelines of the water supply distribution system of a city wherein the main supply reservoir is akin to the given body of knowledge, and the pipelines that carry water to the households, as if they were sending this water of knowledge to the learner. The traditional role of teachers as instructors and of learners as recipients of this instruction is out of tune with the constructivist approach. Teaching involves facilitating opportunities for construction of knowledge and learning involves making these constructions.

ii) The constructivist epistemology is based on the belief that new knowledge is constructed on the basis of prior knowledge. The prior knowledge that learners bring with them to the teaching-learning situation in the classroom should be brought to the forefront. This prior knowledge needs to be incorporated in the learning experiences that constitute teaching learning. On a visit to a primary school in district Bundi in Rajasthan, a teacher showed a yellow colored object to the children of class II and asked, " What color is this? ". A little girl jumped with excitement and said 'Khatti'! Her response was incomprehensible till the teacher told me that khatti means 'kadhi' (a preparation of buttermilk and gramflour garnished with turmeric). Since kadhi is yellow in color, her concept of yellow color is that of the color of 'kadhi'. The teacher then presented many more examples of yellow color and said that this is 'peela rang'(yellow color). Though it is difficult to say whether that child acquired the concept of 'yellow' or not, it nevertheless does tell us how children's new learning or constructions are based on their own previous constructions. Whether the teacher or the other children had 'kadhi' in their minds, this child's notion of reality was definitely based on it.

The prior knowledge varies from learner to learner depending upon the personal and social experiences that they have had in the past. It also varies from culture to culture. Therefore all learners cannot be expected to build on the same foundation. The learners can neither understand the same things nor understand them in the same way. If learning is a constructive process then teaching needs to provide the opportunities for it by supplying the teaching learning experiences taking in account the prior learning and facilitating the building of new knowledge on this basis. For radical constructivists especially, the basis of teaching learning process should not be a predetermined body of knowledge that may be regarded as essential or worthwhile knowledge by the teacher or the educational system; but what the learner already knows and is concerned about. The knowledge that is connected to the learner is more important than that which may be given in any discipline or area of study. Since the vantage point of knowledge construction is this preexisting knowledge of the learner, teachers need to probe and explore in detail what is the knowledge that learners bring with them. However, the social constructivists point out that individual constructions are essentially influenced by cultural constructs (accepted body of knowledge) as knowledge is a body of shared, 'lived in'experiences. For example, the meanings that fine arts such as sketches, painting, sculpture; evoke in the viewers are based on common understanding shared by a community. The social constructivists consider knowledge as consensual and therefore emphasize the importance of discussion, collaborative learning, social negotiation, persuasion, and even demonstration like projecting models and sometimes direct instruction. Thus a teacher with a social constructivist orientation would acknowledge learners' personal constructions but would lead them, through the aforesaid processes, to a shared understanding of the phenomenon. Thus when the child said khatti to denote yellow the teacher may explain, " Yes khatti is yellow color but so is lemon or mustard flowers.

Thus they all belong to the color category called 'yellow'.

The trivial constructivists, however, believe that knowledge is absolute, fixed and knowable. They thus stress on enabling the learner to construct and reconstruct, organize and reorganize, to structure and restructure; then understand so that it matches or at least approximates the external reality.

iii) The constructivist perspective assumes that an active learner has the capacity to construct knowledge himself/herself. The learner is not somebody who needs to be forced to learn by the teacher. She has an inherent capability for it. In fact, that is how knowledge develops. However, the active construction of knowledge is not an instant process, but takes time. It requires self-reflection on the part of the learner. Piaget in fact conceptualized the notion of 'horizontal elaboration', which implied that when children first acquire a new concept, they like to mentally just play around with it for a while, that is to say that they want to elaborate it horizontally. Teaching learning situations thus need to allow time and opportunities for this sort of horizontal elaboration, and overall active construction of knowledge.

Driver (1988) listed the following six features of the constructivist perspective as it relates to schooling:

● Learners are purposive, active and responsible for their own learning. They bring their prior experiences and knowledge to all learning situations.

● The process of learning is regarded as active in the sense that it entails activity on the part of the learner.

● Knowledge is not a thing that exists out there but is personally and socially constructed.

● It is not only the learners who bring their prior experiences to learning situations, teachers also bring in their prior conceptions to the teaching learning situations. These prior conceptions are consanguine not only to the scholastic subjects they teach but also to their assumptions and viewpoint about teaching and learning.

● Teaching does not involve mere transmission of knowledge. It involves the organization of the learning situation and of tasks and opportunities, which facilitate the construction of knowledge.

● Curriculum is not a given that is to be learned; but a schedule of learning tasks, materials and resources by virtue of which learners construct their knowledge.

19.7.1 Constructivist Conditions of Learning

Constructivist conditions of learning are those conditions that are helpful in accomplishing the constructivist goals of education, namely; the active construction of knowledge. There is no gain saying that they emphasize the process of learning rather than its product.

Jonassen (1994) mentioned eight attributes of the learning climate that can be regarded as the constructivist environment:

● It is characterized by multiple representations of reality.

● The complexity of the real world is evident in these representations.

● Knowledge construction rather than knowledge reproduction is emphasized.

● Authentic tasks are regarded as important learning situations.

● Opportunities are arranged for real world settings or case based learning.

- Learners are encouraged to reflect on experience.

- Knowledge construction is not separated from content or context.

- Social negotiation and collaboration among learners are encouraged.

Viewing learning and cognition as a constructivist phenomenon implies constructivist conditions of teaching and learning. The first condition is that the teaching learning situation should involve a complex learning environment. The complexity of the learning environment reflects the complexity of the real world, and allows greater real world settings and experiences. It provides opportunity for interaction with and exploration of many aspects of the environment, due to which the nature and characteristics of the world can be discovered first hand. It also highlights the relationship among facts, principles, ideas and concepts in the immediate environment. It offers to the learner direct opportunities for experimentation because of which he/she develops capacities, procedures and skills for learning to learn. It allows for organization of a rich variety of activities and discovery learning. The verbal presentation of readymade knowledge is avoided, while personal discovery and active construction are nourished. The second condition of constructivist teaching learning environment is multiple juxtaposition of instructional content. A single approach to a complex topic/concept sidesteps its significant aspects, which can become prominent from another vantage point. The varied dimensions of concepts and ideas may become obliviated or emphasized depending upon the perspective with which they are approached and considered. This can and in fact does lead to partial understanding, misconceptions, oversimplification, overgeneralization, learning failures and even patterns of learning failure. All this can be avoided if the same material / concept / topic can be examined from multiple perspectives. In the words of Spiro (1991) " revisiting the same material, at different times, in rearranged contexts, for different purposes, and from different conceptual perspectives is essential for attaining the goals of advanced knowledge acquisition." Multiple juxtaposition of instructional content implies that the same teaching learning material should be examined from multiple perspectives and positions.

The third condition the constructivism implies for teaching and learning is that there should be **focus on authentic activities and social processes.** Authentic tasks and activities are very important learning situations, as they do not separate knowledge construction from its context. Authenticity implies that these activities and tasks have to be similar to those, which the learner comes across in the real life. It should bridge the hiatus between the classroom world and the real world, while also highlighting the usefulness of school knowledge for everyday life. A complex learning environment allows for the incorporation of this authenticity. The knowledge so constructed is authentic knowledge belonging to the learner in the context of one's own world. Almost all academic areas offer the possibilities of designing such contextual activities. Resnick (1987) lamented that in everyday life commonsense knowledge and school knowledge are becoming more and more mutually exclusive. Most learners make little connection, if any, between what they learn in the classroom and what they need to do in real life outside the school. Organization of authentic activities and tasks helps to construct context related knowledge and thereby bridges the gap between school and everyday life knowledge.

Social constructivism, as you know advocates that learning and cognitive development cannot be understood without reference to the social context in which they exist. Social processes are not only social processes but important factors of cognitive growth. Social interaction is critical for learning and cognitive development. Conversation, cooperation, peer tutoring and group work are some of its significant processes. Learners make better sense of the world when they come together to construct meaning from the observed phenomenon and experienced events. It also facilitates the use of multiple perspectives to understand complex topics.

19.7.2 Becoming a Constructivist Teacher

Do you agree with the adage that teachers tend to teach as they have been taught? If you do, then becoming a constructivist teacher is a daunting challenge, as most of us have been taught in the traditional, objectivist model.

Constructivism is the dominant contemporary idea in education, and has far reaching implications for how teachers teach and learn to teach. Becoming a constructivist teacher requires professional preparation in which the constructivist characteristics are cultivated and nurtured. Constructivist teachers do not consider themselves as the containers of knowledge who pour it into the learners (who do not contain it). They ardently believe that the learner is capable of constructing knowledge himself / herself. They are master organizers of learning environments, situations and experiences which are organized in a way, that they bring learners' prior understanding to the forefront while putting forth problems that are not only important to learners but also emerge out of these prior understandings.

When in the classroom, for example, the constructivist teacher first and foremost probes and thereafter draws upon the preexisting knowledge of learners. This knowledge is then challenged by putting forth some information, problem or task which though related to the former; cannot be understood, solved or accomplished solely by this prior knowledge. This challenge is a manifold one, situated as much as possible in the real world and the teacher is only one of the sources at the hands of the learner to resolve it. Learners may work individually or in groups, depending upon their own preference. Peer interaction and peer learning are, however, encouraged. Even though assessment can employ the standard paper pencil tools, it needs to incorporate self-evaluation and group evaluation.

19.8 LET US SUM UP

Constructivism as a theory of knowledge rejects a static, passive or fixed view of knowledge and does not accord an objective value. Constructivism is centered on the idea that human knowledge and learning are actively constructed by the learner and not passively received from the environment. Knowledge involves mental structures that are constructed from past experience. Validity, truthfulness, or completeness of the structures is not important; because if knowledge is made, there is no singular, universal absolute knowledge; if reality is pluralistic, then it is meaningless to debate about what the truth is. There are two main ideas that can be termed as the principles of constructivism: (i) the learner is not a passive entity but an active cognizing subject; (ii) the function of cognition is not the discovery or representation of the world but adaptation. Constructivism is classified into trivial, radical, personal and social constructivism. Trivial constructivism does not discuss the objective reality of the environment but believes that this reality is knowable by the learner through the process of personal construction. Radical constructivism does not deny the objective reality, but considers it unimportant. Personal constructivism regards the individual learner as the constructor of knowledge and prioritizes the individual aspects of learning. Social constructivism is centered around the idea that the culture is a constituent of mind and therefore provides for structures which determine construction of reality. In this sense, no knowledge constructions are asocial or acultural. Constructivists hold extremely opposite views about knowledge to that of the objectivists. Objectivism is based on the belief that knowledge should correspond to reality. Constructivism has implications for educational theory and practice. The main features of a constructivist approach to learning and pedagogy are that constructivist epistemology, rejects a transmission model of knowledge, is based on the beliefs that new knowledge is constructed on the basis of prior knowledge, and it assumes that an active learner has the capacity to construct knowledge himself/herself. For accomplishing constructivist goals of education the learning climate has to be created accordingly.

19.9 UNIT END EXERCISES

1) At the end of your study of constructivism do you believe that education should be based on a fixed body of knowledge or it should rather be based on the child's own constructions of knowledge? Do you favor the pedagogy of transmission or that of construction? Why?

2) Describe the teaching-learning activities you would organize to create a constructivist learning environment for introducing a topic to your class.

19.10 REFERENCES AND SUGGESTED READINGS

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