

PARADIGM SHIFT FROM BEHAVIOURISM TO CONSTRUCTIVISM

Shireesh Pal Singh, Ph. D.

Associate Professor, School of Education Mahatma Gandhi International Hindi University.

Gandhi Hills, Wardha - 442001 (Maharashtra) INDIA

Abstract

A broad model of understanding that provides learners of a specific area with viewpoints and rules on how to look at the areas problems and how to solve them is called paradigm. Paradigms gain their status because they are more successful than their competitors in solving a few problems that the group of practitioners has come to recognize as acute. When specify paradigm reaches a stage of maturity and limitations of the paradigm are established, a new paradigm emerges breaking the limitation of the existing paradigm leading to a shift which is profoundly called a paradigm shift. This paper presents the paradigmatic shift that has taken from Behaviourism to Constructivism in field of education.

Keywords- Paradigm Shift, Behaviourism, Constructivism



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1. INTRODUCTION

Behaviourism is basically concerned with observable and measurable aspects of human behaviour. In defining behaviour, behaviourist learning theories emphasize changes in behaviour that result from stimulus-response associations made by the learner. Behaviour is directed by stimuli. An individual selects one response instead of another because of prior conditioning and psychological drives existing at the moment of the action. In assuming that human behaviour is learned, behaviourists also hold that all behaviours can also be unlearned, and replaced by new behaviours; that is, when behaviour becomes unacceptable, it can be replaced by an acceptable one. A key element to this theory of learning is the rewarded response. The desired response must be rewarded in order for learning to take place. Learning in behaviouristic paradigm is nothing but a modification of the learner's behaviours aiming for a reward. Behaviourist theories of education carry the notion of delivering content from a teacher-centred perspective. Their sole purpose is to help learner's master facts, accomplishments, and relationships that are inherent in a specific knowledge domain.

2. BASIC ASSUMPTIONS IN BEHAVIORISM

In a behaviorist paradigm, learning is observable and it is a result of stimulus provided thus making learning a modification of behavior to be determined and accepted by the environment. Behaviorism attempts to emulate the physical sciences, which entails a refusal to speculate about what happens inside the organism and limits itself from abstaining to inquire into the inner-self and consciousness making it more objective. Subjectivity and inter-subjectivity that takes place in the classroom interactional process do not find any place in behaviorism. The paradigm of behaviorism is based on experiments and during its burgeoning days the most of the experiments were conducted on animals and then generalized to learning among humans.

1. Behaviourism is primarily concerned with observable behaviour, as opposed to internal events like thinking.
2. Behaviour is the result of stimulus – response (i.e. all behaviour, no matter how complex, can be reduced to a simple stimulus – response features).
3. Behaviour is determined by the environment (e.g. conditioning).

Basic principles of behaviourist teaching paradigm are as follows

1. Concepts, principles and laws have an absolute, objective, singular existence in a state of isolation, which is unaffected by the environment, including individuals (the teachers, the learners). (Principle of absolute truth and ontological reality)
2. Concepts to be learned by child of a particular class have been enshrined in a curriculum by the considered view of recommendations of experts (Principle of primacy of curriculum)
3. The textbooks elaborate and describe these concepts with examples, non examples and activities.
4. The teacher's job is to transmit these static and unchallengeable concepts in a classroom situation.
5. The child, viewed as a passive learner, shall have to only receive, what is transmitted. (Principle of passivity of learning)
6. The degree of learning by the child is measured by assessing his/her change in behaviour through reading more of world and/ or adding more to his/her bag of truths and /or facts about the world, as well as by his/her ability to regurgitate (as and when asked for) the accepted explanation and methodology expostulated by the teacher.

Thus the student as an entity had a passive existence imprisoned within the walls of objective world.

3. TEACHING METHODS IN THE BEHAVIORISTIC PARADIGM

Teaching methods which are formulated in the behavioural paradigm do not acknowledge learner's inner life and offer an education which is limited in its scope. There is little or no concern for the learner's active participation in the learning process. Teaching methods are devised with a view to rewarding desirable learning behaviour and punishing undesirable learning behaviour by means of a reward and punishment system of evaluation using averages of points. Teachers in a behavioural setting are made to believe that they are the primary authorities of knowledge and judges in the assessment of learning and thus making teacher centric classroom where student's passivity of mind is emphasized where teachers believe that students come to school as "tabula rasa" to be written upon by teachers. Classroom environment provides an 'input' which is directly transmitted to and accumulated by the students and the resulting behaviour among students is seen as 'output'. They decide what children should learn and how much. Behaviourists assert that the only behaviours worthy of study are those that can be directly observed; thus, it is actions, rather than thoughts or emotions, which are the legitimate object of study. Behaviourist theory does not explain behaviour in terms of the brain or its inner workings. Rather, it posits that all behaviour is learned habits, and attempts to explain with evidence as how these habits are formed.

4. CONSTRUCTIVISM: A PARADIGM SHIFT

In Behaviouristic approach the role of teachers becomes an effective agents of transmission of textbook subject matter through skilful teaching to their pupil. Students in behaviouristic classrooms are expected to be attentive, disciplined and passive receivers of knowledge through their teachers. More often than not, behaviouristic teaching model is criticized for its rote learning, forced memorization and monotonous learning patters and stereo typical reproduction of textbook material which is seen as a manifestation of learning. Hence, shift as, explained in previous section pertaining to paradigm shift, in teaching-learning process was advocated and practiced in many countries from behaviouristic patter to patter that facilitates child as a constructor of knowledge and teacher as a facilitator in the process of child's construction of knowledge which is universally known as "Constructivism" . Rather than the transmission of knowledge, learning is an internal process of interpretation: learners do not transfer knowledge from the external world into their memories; rather, they create interpretations of the world based upon their past experiences and their interactions in the world. The National Curriculum Framework (2005) has stressed the importance of constructive perspective in learning, whereby learning is considered as a process of construction of knowledge. Learners actively construct their own knowledge by connecting new ideas to the existing ideas on the basis of materials or

activities presented to them (experience). The traditional methods of teaching was based on objectivist view of knowledge where the teacher transmits knowledge to the learners who are considered as passive receivers of knowledge. In contrast, the constructivist paradigm is based on the assumption that knowledge is subjective and learners construct knowledge in the social and cultural environment in which they are embedded.

The advancements in science and technology have developed tremendously all over the world, due to which life has become very easy to live on. Education in modern times must lay increasingly greater emphasis on the inculcation of scientific spirit and knowledge of scientific principles and facts and also training in scientific method. Learning science should happen in an active manner with hands on experience by the learner. The construction of any knowledge never starts at ground zero, but always has its basis in an already existing knowledge structure. The existing knowledge or experience is the starting point for any interpretation of the process of information that lead to learning as a construction of knowledge, such learning is not determined by general laws but depends very much on the situation and context in which learning takes place .

Constructivist learning is based on student's active participation in problem solving and critical thinking regarding a learning activity. Students construct their own knowledge by testing ideas and approaches based on their prior knowledge and experience, applying them to new situation and integrating new knowledge gained with pre-existing intellectual constructs. The teacher is a facilitator or a coach who guides the student's critical thinking, analysis and synthesis abilities throughout the learning process. The teacher is also a co-learner in the process (Sharma, 2006). Science teaching should be always made an interesting one as it can help the child to develop in all aspects like cognitive, social, emotional development etc. It depends on the context and situation in which the child learns. If it is supportive, it will create interest in learning. This is what the constructivist approach tries to provide. Experiments should be performed by the student themselves, and this will create a lot of confidence. Thus, truth would be found out from their surroundings and not through text books. This will help in the acquisition of scientific attitude. Science teaching should involve a scientific method that will help the child to think critically and develop scientific skills in them. But the present classroom method does not cater to these objectives. Usually in classroom, science teaching take place through conventional method without hands on experience. Such a science instruction does not develop cognitive abilities but focuses only on the information of facts and preparing students for examination. Developing cognitive abilities helps the students to think as a scientist. Hence there is a need to try those methods, which help in sharpening the cognitive abilities of students.

The classroom remains dominated by teachers thus resulting in teacher-centeredness. Though we speak of child-centred learning, we have never tried to create a learner friendly environment in the classroom. Objectivism is based on the assumption that knowledge is objective, universal and complete and it can be imparted by those who have it, to those who do not have it. Constructivism, on the other hand is based on the assumption that knowledge is subjective, contextual and inherently partial'. It is necessary to see that what child already knows links with the present knowledge how is it related and how he learns a particular concept. The importance lies in the fact that mere teaching or reading and rote memorization do not lead to meaningful learning. The idea that we construct in our cognition and its application is the true learning.

It was felt that there is a need to critically examine the existing practice of teaching skills and strategies, the lesson plans used in different pedagogic courses especially science, the evaluation profiles and other tools used. There is a need to develop various inquiry forms and learning designs with inbuilt contextualization and collaborative techniques in teaching of science which can facilitate the teachers and teacher educators to adapt them to their classroom situations. It was felt essential to propose this training programme- that would facilitate the teachers and teacher educators in becoming effective teachers.

The constructivist movement has grown essentially from dissatisfaction with educational methods where rote memorisation, regurgitation of facts and the division of knowledge into different subjects, led to a situation where learners were not necessarily able to apply what they have learned in real life (Dixon-Kraus, 1996). Constructivism can be understood as a theory of learning: student construct knowledge in the process of learning through interaction with phenomenon, as they develop shared-meaning of a phenomenon via interactions within a social context (Geer & Rudge, 2000). It is generally agreed that students learn by making sense of phenomenon as they experience it, evaluate its evidentiary merits, and attempt to make sense of it within a socially acceptable context in light of prior knowledge. This theory hypothesizes that individuals will try to make sense of all information that they perceive, and that each individual will, therefore, "construct" their own meaning from that information. Driscoll (2000) explains that constructivist theory asserts that knowledge can only exist within the human mind, and that it does not have to match any real world reality. Learners will be constantly trying to derive their own personal mental model of the real world from their perceptions of that world. As they perceive each new experience, learners will continually update their own mental models to reflect the new information, and will, therefore, construct their own interpretation of reality.

To discuss constructivist education, firstly, there is a need to define constructivism, Below given definitions helps in developing an understanding about the very concept of Constructivism

"Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world we live in. Each of us generates our own 'rules' and 'mental models', which we use to make sense of our experiences. Learning, therefore, is simply the process of adjusting our mental models to accommodate new experiences" (Clark, 1999).

"Constructivism is a theory of teaching and learning that draws on a range of teaching practices including inquiry-based learning, cooperative learning, and project-based approaches." (Callision, 2001)

"Constructivism is fundamentally no positivist and as such it stands on completely new ground—often in materialism. Rather than behaviors or skills as the goal of instruction, concept development and deep understanding are the foci; rather than stages being the result of maturation, they are understood as constructivism of active learner reorganization" (Fosnot, 1996).

"Constructivism is a theory about knowledge and learning, it describes what 'knowing' is and one 'comes to know'" (Fosnot, 1996).

"Constructivism does not claim to have made earth-shaking inventions in the area of education; it merely claims to provide a solid conceptual basis for some of the things that, until now, inspired teachers had to do without theoretical foundation" (Glaserfeld, 1995).

"Basically defined, constructivism means that as people experience something new they internalize it through past experiences or knowledge constructs that have been previously established" (Crowther, 1999).

The following concepts which are derived from the above definitions help to form the framework for constructivism; Learners learn by being actively engaged and reflecting on that experience, Learners learn by building on what they already know and Learners develop higher-order thinking through guidance at critical point in the learning process.

5. SCHOOLS OF THOUGHT IN CONSTRUCTIVISM

Major schools of thoughts are elaborated and enlisted as below:

1. Philosophical Constructivism
2. Social Constructivism
3. Educational Constructivism Which Consists Of Three Categories
 - a) Cognitive Constructivism
 - b) Radical Constructivism
 - c) Cultural Constructivism
4. Cultural Constructivism

5. Critical Constructivism
6. Genetic Constructivism
7. Developmental Constructivism
8. Epistemological Constructivism

1. PHILOSOPHICAL CONSTRUCTIVISM

Constructivism has its foundation in philosophy. Constructivism is an epistemology, a philosophical explanation about the nature of knowledge. Experts are giving credit Immanuel Kant as the father of constructivist thought; some of them suggest constructivism can be traced to Socrates. Constructivism is more a philosophy, not a strategy. Rather, constructivism is an underlying philosophy or way of seeing the world by exploring; what is reality; what is knowledge and what kind of human interaction persist.

Emmanuel Kant, a German philosopher theorized that objective experience is actively constituted or constructed by the functioning of the human mind. Kant is primarily interested in investigating the mind for epistemological reasons. One of the goals of his mature “critical” philosophy is articulating the conditions under which our scientific knowledge, including mathematics and natural science, is possible. Kant use *critique* to explain knowledge. Kant then derives three further “powers”, termed by Kant as “sensibility”, “understanding”, and “reason”.

John Dewey was a leading proponent of the American school of thought known as pragmatism, view that rejected the dualistic epistemology and metaphysics of modern philosophy in favor of a naturalistic approach that viewed knowledge as arising from an active adaptation of the human organism to its environment.

2. SOCIOLOGICAL CONSTRUCTIVISM

This school of thought lays emphasis on social factors which play an important role in advancement of knowledge which led to the emergence of Sociological Constructivism. According to sociological constructivism the progress of science and technology and the generation of the public body of knowledge are due to changing social conditions and interests. Sociological Constructivism contends that categories of knowledge and of "reality" itself are actively created by and are the products of social and symbolic relationships and interactions, all within the given temporal and spatial boundaries of a cultural context. They are contingent on convention, language, human perception, and social experience. These interactions affect how we organize all aspects of our lives, from the way define and know the sacred, to the way we conduct scientific investigation. What is thus "real" is that moment of intersection of those participating. Reality is ultimately understood as an event, as a "process" of becoming, and not as a concrete, discrete object, though as a construct, "reality" could be defined in a multiplicity

of ways. A concept or practice which may appear to be "natural" and "obvious" to those who accept it, but in reality is an invention or artifact of a particular culture. It is guided by theories of Sociology of Scientific Knowledge and associated with the sociology of science, concerns with social influence on science. It argues that all knowledge is instructed and interpreted socially in the frame of science. The sociologists treat the individual mind as a 'black box' whose inputs are sociological concerns and outputs are in the form of statements of belief (read knowledge) which may be true or false. For Social Constructionists, as all our knowledge is a "construction," what we know does not necessarily reflect any external "transcendent" realities. There is no absolute material reality, nothing precipitated by universal laws of society or nature. As a theory, Social Constructivism falls well within a long tradition of social science and anthropological thinking regarding the pivotal role of culture and its effect on human behavior. Sociological Constructivism is further categorized as below:

3. EDUCATIONAL CONSTRUCTIVISM

This can be further elaborated in to following three category

3.1. Psychological Constructivism

This is category of constructivism known as "Psychological Constructivism". Psychological constructivism addresses the manner in which people learn. The basic premise being that knowledge is made, not acquired. Psychological constructivists do not focus on what should be known, but rather how it is known. Jean Piaget, a noted Swiss developmental psychologist, theorized that children construct knowledge from their actions on their environment. The process of learning involves both the learner and the knowledge being learned. David Perkins (1999) identifies three roles for the learner. First is the learner who acquires knowledge actively. Second is the social learner who co-constructs knowledge in dialogue with others. Third, the creative learner needs to create or recreate knowledge for himself. Perkins also identifies three kinds of knowledge. First is inert knowledge that is gained by solving problems that make connections to the world. Second is ritual knowledge that is acquired via authentic problem solving and makes learning meaningful. Finally is the conceptually difficult knowledge, which is gained through inquiry that confront initial theories or prior knowledge. Through this better understanding of the process of learning, constructivism is then seen as a toolbox. Troublesome knowledge invites responses to fit the difficulties – there is not one standard constructivist fit.

3.2. RADICAL CONSTRUCTIVISM

It is part of a larger 'constructivist' movement in the philosophy and sociology of science (Schwandt 1994). Its founder and most prominent proponent is the American psychologist Ernst

von Glasersfeld. This philosophy insists that human knowledge cannot consist in an accurate representation of an external reality, existing apart from the subject's experiences. Take for example the colour blue. Von Glasersfeld argues that "blue" is to be known only by the individual, there is not a shared knowledge of "blue." He would ask, "How can I be sure that my 'blue' is the same as your 'blue?'" In this light, all learning is constructivist, no matter what instructional approach is used, just because of how the mind operates

3.3. SOCIAL CONSTRUCTIVISM

Lev Semyonovich Vygotsky (1896-1934), a leading Russian developmental psychologist, is the propounder of social constructivism. In it, he brings to focus the role of the society in the process of knowledge acquisition by a learner. According him collaboration is the key in knowledge construction. His theories about language, thought, and their mediation by society (Bruffee, 1983) have significant impact on modern constructivism. Previously, learning was considered to be an almost individual enterprise following the behaviorist principles. Vygotsky's theories have propelled educationists to recognize the role of the society and culture in learning. Vygotsky's main ideas can be found in the posthumously published works, *Thought and language* (1986) and *Mind in Society* (1978).

Vygotsky delineated the proactive role of language and society vis-a-vis indigenous culture for the cognitive development in the child. He visualized the child not as a physically isolated and intellectually segregated individual but as a prosensitive individual who is being constantly exposed to social interaction in social context, right from her birth onwards Vygotsky argues that all higher mental functions are social in origin and are embedded in the sociocultural fabric. These higher mental functions are primarily interpsychological (two or more persons) in nature, originating between and among individuals. Then an individual's mental processes convert them to intrapsychological (individual) form for the individual. Thus learning may be viewed as developing first in group setting before becoming individual (Wertsch, 1979). Social constructivism views individual knowledge and social knowledge to be one and the same. It suggests that construction of knowledge is facilitated by the vast cultural repertoire of artifacts, ideas, assumptions, concepts and practices which an individual inherits or is born into. Thus, learning is a form of cultural apprenticeship.

4. CULTURAL CONSTRUCTIVISM

This trend in Constructivism encompasses the view that knowledge and reality are constructed culturally. Beyond the immediate social environment of a learning situation are the wider

context of cultural influences, including custom, religion, biology, tools and language. As such, two independent cultures will likely come up with different categorizations of constructing the world. This means that there are two completely different ways in which the world is broken down.

5. CRITICAL CONSTRUCTIVISM

Critical constructivism looks at constructivism within a social and cultural environment, but adds a critical dimension aimed at reforming these environments in order to improve the success of constructivism applied as a referent (Dougiamas, 1998). Taylor (1996) describes critical constructivism as a social epistemology that addresses the socio-cultural context of knowledge construction and serves as a referent for cultural reform. It confirms the relativism of radical constructivism, and also identifies the learner as being suspended in semiotic systems similar to those earlier identified in social and cultural constructivism. To these, critical constructivism adds a greater emphasis on the actions for change of a learning teacher (Dougiamas, 1998). Not only truth and reality, but also evidence, document, experience, fact, proof and other central categories of empirical research reveal their contingent character as a social and ideological construction. Thus, a realist or relativist interpretation is subject to criticism.

6. GENETIC CONSTRUCTIVISM

Genetic here has the proper sense of genesis of cognitive forms, but not of heredity. Thus, the schemes and cognitive structures proper of the subject-of-knowledge (community of scientists and/or community of laymen) are permanently questioned in the process of knowing (Piaget, 1967). Genetic constructivism asserts that the cognitive function is the same in any human being and is characterized by the cognitive activities of assimilation and accommodation which make the cognitive adaptation of the objects (cognitive obstacles). This adaptation is made through schemes and/or structures constructed by the subject of knowledge when confronted by social and historical needs. In this sense, there is no functional difference between common sense and scientific sense, but only a structural differentiation

7. DEVELOPMENTAL CONSTRUCTIVISM

Developmental constructivism as originally discussed by Piaget (Piaget & Inhelder, 1969) and further elaborated by researchers of post-formal development (e.g. Commons, 1989) also views knowledge as a proactive construction of the knowing organism. According to developmental constructivism, knowledge is an active construction of the knowing subject, triggered by the quest for equilibrium i.e., by the cognitive system's need for order and stability. Ibanez (1992) has noted that knowledge cannot logically be viewed as a representation or a copy of reality, since in order to know whether something is a good copy of something else we need to

independently access both versions so as to compare them. Developmental constructivism also departs from the objectivist conception of truth as correspondence between mental representations and reality. According to most organismic perspectives, knowledge systems develop by means of recurrent qualitative shifts in the direction of increased complicity (Werner, 1957). Thus, knowledge can never be considered an accurate depiction of reality; since each new refinement will require justification at a newer and higher level. Developmental constructivism equates knowledge with dialectically, adaptive i.e., the ability to adopt one's knowledge structures to the environment and to adapt the environment and to one's knowledge structures.

8. EPISTEMOLOGICAL CONSTRUCTIVISM

Epistemological constructivism is about the study of theory of knowing and not theory of knowledge as such in terms of methods. Here the main emphasis is on how a child arrives at the process of knowing. The importance of constructivism is best understood by comparing it with the opposite, more traditional, approach in epistemology, which sees knowledge as a passive reflection of the external objective reality. This type of constructivism emphasizes more specifically on methodological aspect of knowing.

6. CONCLUSIONS

Thus, a shift in child learning is a major movement which led to the genesis of new paradigm of teaching-learning, i.e., constructivism (which is discussed elaborately in the above sections) and National Curriculum framework: 2005 endorses the same in order to make classroom teaching more learner centric. This paradigm shift from Behaviorism to Constructivism in education has major implication on teacher education

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