

LANGUAGE IN INDIA

Strength for Today and Bright Hope for Tomorrow

Volume 11 : 8 August 2011

ISSN 1930-2940

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Philosophies of Education: Origin of Concept Formation

Aamna Saleem Khan, Ph. D. Scholar

Introduction

Discussion relating to concept formation is as old as education itself. Different philosophers define concepts in different ways and they recommended different theories and schools of thought to form and strengthen the concepts. The following schools of thoughts give the information about how to form concepts and what are the responsibilities of teachers to make concepts more clear and sound.

1.1 SCHOOL OF THOUGHTS

1.1.1 Idealism

Idealism's proponents are Berkeley, Butler, Froebel, Hegel and Plato. They say that knowing is the rethinking of latent ideas. Idealist knowledge is based on the recognition or reminiscence of latent ideas that are already present in the mind. Such ideas are a priori; that is, they concern knowledge or concepts that exist prior to and independent of human experience about them. The teacher's task is to bring this latent knowledge to consciousness. The idealist educator refers the order and pattern of a subject-matter curriculum that relates ideas and concept to each other (Ornstein and Levine, 1985).

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The teacher should act as a guide to develop critical thinkers and should deal with broad concepts rather than specific skills. This is a content-centred approach in which emphasis is given on universal truths and values (Conti, 2007).

Idealists are of the view that teacher should be a skilful questioner, who should be a model for children to promote self realization and self education. While teachers cannot always be present when learning occurs, they must attempt to stimulate students so that learning occurs even in their absence. Project based learning is recommended by idealists which is self directed learning activity where learning can occur without a teacher's presence (Martinez, n.d.).

To form the concept, classroom management leads to transference of few discipline problems to student. With the involvement of students, the teacher handles any problem about their behaviour. Teaching method focuses on handling ideas through lecture, discussion and Socratic dialogue, introspection, intuition, insight and whole part logic to bring ideas into consciousness that are latent in the mind (Cohen and Gelbrich, 1999).

1.1.2 Realism

Realism's proponents are Aquinas, Aristotle, Broudy, Martin and Pestalozzi. They say that knowing is the process that involves two stages: sensation and abstraction. First, the knower sees an object and records the sensory data about it such as colour, size, weight, smell or sound. These sensory data are sorted out in the mind into those qualities that are always present in the object and those qualities that are sometimes present in the object. Upon the abstraction of the necessary qualities of an object, the learner comes to a concept of the object. Conceptualization results when the mind has abstracted the form of an object and has recognized the object as belonging to a class (Ornstein and Levine, 1985).

Realists are in favour of inquiry, verification of ideas in the world of experience, teaching those concepts which are essential and practical and develop the learner's rational powers by teaching fundamentals through scientific method. The teacher has to present material in a systematic way, encourage the use of objective criteria and be effective and accountable (Conti, 2007).

Ideas, like things, always exist and always resist change and seek self-preservation. Some ideas may be driven due to consciousness but the excluded ideas continue to exist in an unconscious form and tend to return spontaneously to consciousness.

The formation of character by the development of an enlightened will, capable of making judgments is the ultimate aim of realists. In the classroom, the aim of the lessons is to introduce new conceptions, to bind them together and to order them.

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Realists stress the accountability. Realists emphasize the concept acquisition as the curriculum. The teacher adopts new technology to develop the concept by emphasizing realistic novel and by stressing precision and accuracy in mathematics, science, social studies and writing.

1.1.3 Existentialism

Existentialism's proponents are Roger, Sartre, Marcel, Morris and Soderquist. They believe that the universe is indifferent to human wishes, desires and plans. Human freedom is total. They also hold that one's responsibility for choice is total. The child has the possibility of being an inner-directed and authentic person. An authentic person is one who is free and aware of his or her freedom. Such a person knows that every choice is really an act of personal value creation. The authentic person is his or her own definer and is aware that self-definition is the personal responsibility (Ornstein and Levine, 1985). They think that concept formation is possible by emphasizing individual choice. For doing this, the teacher stresses individual freedom; empowerment of student to make choices about what and how they will learn.

Existentialists promote self-understanding, involvement in life, an awareness of alternatives and the development of a commitment to choices. Learning is a process of personal development in which options are provided to learners. The instructor's role is to be a facilitator. In this philosophy, trust is developed between the teacher and learner (Conti, 2007)

Existentialism places the highest degree of importance on student perceptions, decisions and actions and individuals themselves are responsible for determining true or false, right or wrong, beautiful or ugly. To sum it up, students make choices and then take the time to evaluate those choices. The teachers help the students to define their own goals and by creating an environment in which they can freely choose their way. In it, students think for themselves and are aware of responsibilities assigned to them. Individual are the focal point in teaching method that have the unique talents. Their learning is self-paced, self directed and includes a great deal of individual contact with the teacher, who relates to each student openly and honestly. The teacher views that each student has an individual identity and each student should learn how to achieve his full potential by trying new concepts (Gibbs, n.d.).

1.1.4 Pragmatism

Pragmatism's proponents are Childs, Dewey, James and Peirce. Another name for this approach is experimentalism. Pragmatists believe that human purposes and plans could be validated only by acting on them and judging them by their consequences. For this, they stress the methodology or the process of problem-solving. They argue that learning occur as the person engages in problem-solving. The learner, as an individual or

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as a member of a group, utilizes the scientific methods to solve both personal and social problems. The problem-solving method can be developed into a habit that is transferable to a wide variety of situations (Ornstein and Levine, 1985).

They are of the view that education is the necessity of life so its aims are to seek understanding, coordinate all environments into a whole, teach a process of inquiry and promote personal growth and democracy. As every individual is different so the instructional process should be flexible for problem solving and discovery. In this learner-centred approach, the role of teacher is as a resource person who identifies the needs of the learner. The role of the teacher is to educate the child successfully by capturing the child's interest and build on the natural motivation. Teachers should use different teaching methods to accommodate each individual learning style. Due to individual difference, the teacher must vary his/her teaching style. They believe that knowledge should be organized and relate to current experiences (Woodson, 2007). They apply democratic methods for concept formation by considering classroom as a community of learner. Teacher encourages students to test ideas by corruption and competition.

1.1.5 Perennialism

Perennialism's proponents are Adler, Hutchins and Maritain. It is rooted in realism. Perennialists say that human nature never changes; hence there should be uniformed education everywhere for each nation of the world. They agree that the fundamental components of the soul are intention, reason and aesthetic sense. These concepts can be taught by arranging such methods that enable the students to settle their affair successfully, when they enter the field of practical life (Amin, 2000). Because of this, the teacher emphasizes searching for the truth and rationalization. They want to make a learner as an avid reader and writer. By using lecture method, didactic learning and Socratic `Method, they form the concepts. They form the concepts by encouraging students to organize, clarify and connect thoughts to make accurate quantitative comparisons.

The focussing area of perennials is to teach everlasting ideas and enduring truths. They are of the view that out-dated and incorrect information should not be taught to students. They recommend that schools should allot more time for teaching and explaining meaningful concepts (Theodore, n.d.).

1.1.6 Essentialism

Essentialism's proponents are Bagley, Bestor, Conant and Morrison. It is rooted in idealism and realism. Essentialists hold that it is the task of school to channel the accumulated experience of human kind into organized, coherent and differentiated disciplines. Only after mastering these basic disciplines can the student is expected to use them to solve personal, social and civic problems. For this, the teacher has the knowledge

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of his own subject and it is his obligation to impart education to the children. It is the duty of the students to benefits from the teachers and collect, as much as possible, the educational facts and hints from them (Amin, 2000).

The teachers can develop the concepts by teaching basic skills (reading, writing and arithmetic) and knowledge. They use previous concepts to develop students' higher thinking skills (Ornstein and Levine, 1985). They are in the favour of traditional methods to sharpen the mind and clarify the concepts. Command over the educational material is gained, comparatively, in better form through the traditional methods (Amin, 2000).

For essentialists, students are required to master information about the people, events, ideas and institutions. Essentialists argue that classrooms should be teacher-oriented and the whole responsibility is of the teacher. The teacher should serve as an intellectual and moral role model for the students. Essentialists hope that when students leave school, they will not only possess basic knowledge and skills but they will also have disciplined, practical minds, capable of applying lessons learned in school in the real world (Theodore, n.d.).

1.1.7 Progressivism

Progressivism's proponents are Dewey, Johnson, Killpatrick, Parker and Washburne. It is rooted in pragmatism. Progressive education focus on the child as the learner rather than on the subject; emphasized activities and experiences rather than verbal and literary skills; and encouraged cooperative group learning activities rather than competitive individualized lesson learning (Ornstein and Levine, 1985). Progressivists say that the teacher should guide and lead the students when ever the need arises. He should not, in person, dominate each thing every time. His right and suitable role is to act as a consultant or advisor (Amin, 2000).

Student-centred teaching methods are recommended by progressivists, in which the teacher is the facilitator of knowledge. For them, the teacher is responsible to get each student's attention and interest on various topics and concepts and then allows the students to learn about each topic and concept through discovery and inquiry. This will help the students to engage in deeper thinking about the material. The classroom environment should be designed in such a way that freedom is given to every student to ask questions without feeling unsure or insecure and feel comfortable to share their interests and concerns about the subject matter (Wagner, n.d.).

So they recommend that the teacher should assist learning by using intrinsic rewards and use students-centered methods to develop concepts by self-directed learning. They hold the view that teacher should be a resource person and a guide to learning activities.

1.1.8 Reconstructionism

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Reconstructionism's proponents are Brameld, Counts and Stanley. It is rooted in pragmatism. Education is designed to awaken the students' consciousness about social problems and to engage them actively in the solving of problems. To awaken social consciousness, students are encouraged to question the status quo and to investigate the controversial issues (Ornstein and Levine, 1985).

Reconstructionists are not in favour of predetermined curriculum. They recommend the subject matter from any or all disciplines when there is a need to solve a problem. They prefer the subject matter of social experience in solving problems. The reconstructionists are in favour of applying the problem-solving method (scientific method) to real-life problems. After one has reached an "intellectual solution" to a problem, he should carefully thought-out social action to remedy the problem (Ozman, n.d.).

By this, teacher develops the concepts by encouraging students to address and attempt to solve social problem. The education should undertake the experimentation of new social system immediately. The teacher may convince about the need of reconstruction. It is obligatory for a teacher to present honestly all aspects of the problems faced by the society and should not hide any one of them. Similarly, he may express, his own point of view to develop and strengthen the concepts, if need be, but should never intentionally try to impose it on them (Amin, 2000).

Reconstructionist teachers are social reformers. They believe that continuous thoughtful change is required for the improvement of society and the best change agent is the educational process. Teachers should focus on critical issues and allow students to have an active discussion about these issues (Goodly, n.d.).

Reconstructionists believe that the teacher should be an educational activist. The teacher should be a person who is aware of what is going on in society and have an opinion and is able to discuss this with the students. Teachers need to be freed from passivity and fear of working for change. They need to focus on critical issues not generally found in textbooks or made a part of the school curriculum. They also need to make students more critical about the knowledge they receive (Bazile and Nauman, 2004). Reconstructionists stress experimentation and problem solving as teaching methods.

Different philosophies have different concepts about knowledge. Idealists see cognition as the recall of latent ideas of mind to strengthen the concepts. For realist knowledge begins with our sensation of objects to form concepts that correspond to the objects in reality. Existentialists state that the individuals choose the knowledge to grasp that they wish to possess. Pragmatist said that we create knowledge by interacting with environment; hence concepts are formed due to this interaction. Perennials are of the view that the mind forms the concepts when they are organized, clarified and connected with one another to form new and complex concepts. They said that concepts can be

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developed into higher thinking skills by clarifying them. Progressivists view that concepts are learnt through discovery and inquiry in which students are engaged in deeper thinking. By reconstructionists, concepts can be developed and strengthened when students address and attempt to solve problems.

All philosophers put emphasis on concept clarification. They have different opinions about the development of concepts. However they recommend different methods and strategies to form concepts. They provide a base to change old and simple concepts into new and complex ones. The focusing area of all schools of thought is concept formation, concept clarification and promotion of conceptual change.

1.2 APPROACHES TO COGNITIVE DEVELOPMENT

1.2.1 Piaget's Approach to Cognitive Development

Jean Piaget was a Swiss psychologist whose insightful description of children's thinking changed the way we understand cognitive development. He devised a model describing how humans go about making sense of their world by gathering and organizing information (Woolfolk, 1998).

Piaget's theory of cognitive development is based on the idea that people make a sense of the world and actively create their knowledge through direct experience with objects, people and ideas. Maturation, activity, social transmission and the need for equilibrium, all these influence on the way of thinking and as a result of this process knowledge is developed. In response to the influences, according to Piaget's theory, thinking process and knowledge develop through adaptation (including the process of assimilation and accommodation) and changes in the organization of thought (Woolfolk, 1998).

In Piaget's theory, cognitive development occurs in a series of distinct and universal four stages. Each stage is characterized by increasingly sophisticated and abstract levels of thought. These stages always occur in the same order and each builds on what was learned in the previous stage. They are as follows:

- a) Sensorimotor stage (infancy): In this period, which has six sub-stages, intelligence is demonstrated through motor activity without the use of symbols. Knowledge of the world is limited, but developing, because it is based on physical interactions and experiences. Children acquire object permanence at about seven months of age (memory). Physical development (mobility) allows the child to begin developing new intellectual abilities. Some symbolic (language) abilities are developed at the end of this stage.
- b) Pre-operational stage (toddler-hood and early childhood): In this period, which has two sub stages, intelligence is demonstrated through the use of symbols, language use matures, and memory and imagination are developed,

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but thinking is done in a non-logical, non-reversible manner. Egocentric thinking predominates.

- c) Concrete operational stage (elementary and early adolescence): In this stage, characterized by seven types of conservation (number, length, liquid, mass, weight, area and volume), intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects. Operational thinking develops (mental actions that are reversible). Egocentric thought diminishes.
- d) Formal operational stage (adolescence and adulthood): In this stage, intelligence is demonstrated through the logical use of symbols related to abstract concepts. Early in the period there is a return to egocentric thought. (Huit and Hummel, 2003).

At heart, his theory is:

- a) a genetic one, in that higher processes are seen to evolve from biological mechanism which are rooted in the development of an individual's nervous system;
- b) a maturational one, because he believes that the processes of concept formation follow an invariant pattern through several clearly definable stages which emerge during specific age ranges;
- c) a hierarchical one, in that the stages he proposes must be experienced and passed through in a given order before any subsequent stages if development are possible (Child, 1995).

1.2.2 Vygotsky's Approach to Cognitive Development

Lev Semenovich Vygotsky was a pioneering Russian cognitive psychologist who made an enormous contribution to our understanding of language and thinking (Crowl, Kaminsky and Podell, 1997).

In Vygotsky's theory, language is the most important symbol system for learning. Language is critical for cognitive development. It provides a means for expressing ideas and asking questions, the categories and concept for thinking and the links between the past and the future. When we consider a problem, we generally think words and partial sentences. He places much more emphasis on the role of language in cognitive development. He viewed that language in the form of private speech (talking to yourself) guides cognitive development (Woolfolk, 1998).

Three stages of concept formation were proposed by Vygotsky: first, there is *vague syncretic* ('syncretic' in this context means random rather than reasoned grouping of objects, in which the child sort out a shapeless, disorganized heap of objects, designated by a word, often without any internal relation between them (Child, 1995).

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The second stage is *thinking in complexes*. These are a kind of primitive concept in which a child groups attributes by criteria which are not the recognized properties which could be used for the classification of concepts (Child, 1995). At this stage complexes are formed. Groups and families of objects are classified on the basis of their objective, common features and immediate image.

The third stage identified by Vygotsky is called the *potential concept* stage in which children can cope with one attribute at a time but is not yet able to manipulate all the attributes at ones. Maturity in concept attainment is reached when the child can do this (Child, 1995).

Vygotsky distinguishes three stages in the development of concept formation in children:

- 1) Sorting out a shapeless, disorganized heap of objects, designated by a word, often without any internal relation between them;
 - 2) Formation of complexes, groups and families of objects on the basis of their objective, common features and immediate images;
 - 3) Formulation of true fully developed concepts (Duric, 1989).
- An indispensable role in concept formation is played by the word, the language.

The word represents a means of uniting the psychic experience into a concept.

With concept attainment, the situation is different from that of concept formation. The process of concept attainment in the guided learning of pupils means that the pupils purposefully acquire the concept used by adults, formed in the long process of social development. In this way the results of human cognition and activity are transmitted to pupils. Therefore it is said that conceptual learning has two aspects. One aspect represents the concept formation by the subject themselves (with the adults help), while the other is composed of the attainment of ready-made concepts formed by the society. The concept acquired by purposeful, systemic learning and study is called scientific concepts and the ones formed by the child himself are called experiential concepts (Duric, 1989).

Vygotsky (1978) believed that two levels of mental functions exist in every individual i.e. elementary and higher mental functions. The individuals are born with elementary mental functions i.e., no learning is required for their use. Thinking is not required for such functions and they occur naturally such as hunger and sensing. But in higher mental functions, the creation and use of self-generated stimulation such as memory, attention, thinking and language are involved (Galant, 1998).

Vygotsky emphasized the development of higher level thinking and problem solving in education. If opportunities are provided to students to utilize critical thinking skills, their thought processes will be challenged and new knowledge will be gained.

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Behaviour modification of every individual depends upon the knowledge achieved through experience (Dahms, *et al*, 2008).

1.2.3 Taba's Strategy to Cognitive Development

Hilda Taba and associates (1964) have focussed their intensive research largely on the development of a strategy for the generation and the enhancement of independent thought process (Woods, 2002).

Taba built her approach around three assumptions:

1. Thinking can be taught (through engaging students in practice, in particular inductive reasoning).
2. Thinking is an active transaction between the individual and data. This relies on earlier theories.
3. Processes of thought evolve by mastery learning (Joyce, Weil and Calhoun, 2000).

Taba identified three categories of thought processes or cognitive tasks: (a) concept formation, (b) interpretation of data and the making of inferences, and (c) the application of known principles and facts to explain new phenomena, to predict consequences from known conditions and events or to develop hypotheses by using known generalizations and facts.

a) Concept Formation

Since concept formation is considered the basic form of cognition on which all cognitive processes depend, Taba utilized basic concept formation and defined it as consisting of three different processes or operations: i) the differentiation of the specific properties of objects or events (this differentiation involves the process of analysis in the sense of breaking down the global complexes representing objects and events into specified properties); ii) grouping or a process of assembling specified properties across many objects and events; and iii) labelling or categorizing, i.e. explicitly identifying the basis for grouping and subsuming the items under some label or category (Woods, 2002).

b) Interpretation of Data

Interpreting data and making inferences from them is essentially an inductive process of developing generalizations, although never accomplished without some application of what is previously known. This task involves four basic operations. One is that of assembling concrete information, either by instigating a process of recall and retrieval of previously learned information or by being presented new information and identifying the specific points in this set of data. Second is that of explaining or giving reasons for certain events. The third operation consists of relating different point of processed information and relating the information thus obtained to its possible

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connection with standards. The fourth operation is that of formulating generalizations or inferences (Woods, 2002).

c) Application of Principles

A third cognitive task has to do with applying previous knowledge, principles, generalizations or facts to explain new phenomena and to predict consequences from known conditions.

Essentially, two different operations are involved: that of predicting and that of establishing the parameters either of logical relationships or of information with which to test the validity of predictions. The level of prediction or a hypothesis can be judged according to the extent of the leap from a given condition. But equally important is the completeness of the parameter, the chain of links which connects the predictions and the conditions (Woods, 2002).

Woods (2002) explains that application of principles invites a greater degree of divergence than either of the preceding cognitive tasks. Each condition presented as data invites a divergent line of predictions. For this reason, this process contains opportunities for creative and divergent use of knowledge).

The operations involved in applying principles are quite crucial to developing productive pattern of thought. This process is the chief vehicle for transfer of knowledge. This process is, therefore, crucial for getting mileage out of the little that student can acquire directly during their schooling. It is a chief means for creating new knowledge by logical processes and a way of acquiring control over wide areas of new phenomena. It is also the process by which models for hypothesizing can be created, freeing the individual from the necessity of being bound to the immediate stimulus (Woods, 2002).

Taba's strategies focus on the teacher as the mediator rather than as the lecturer. When utilizing the Taba approach, the teacher leads the discussion by sharing their opinions and relating their own ideas to their peers' ideas. The teacher should not judge the students by their answers and can neither agree nor disagree with their responses. The teacher should use verbal feedback to strengthen their concepts. The teacher should avoid nonverbal cues during students' responses. Encouragement should be given by the teacher to the students to expand their classmates' ideas or to invite students to clarify their own ideas by discussing them (Wikipedia The Free Encyclopaedia, n.d.).

1.2.4 Bruner's Approach to Cognitive Development

Jerome Bruner is an American psychologist who developed a theory of cognitive development to help teachers to promote student learning and thinking. Jerome Bruner formulated a concept formation theory that involved cognitive processes, i.e. hypothesis

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testing about a concept by making guesses about which attributes are essential for defining the concept.

The Concept Attainment Model (CAM) of teaching has been presented by Bruner, Goodnow and Austin. It is developed by their study of Thinking. The Concept Attainment Strategy as model of teaching is concerned with two separate but related ideas:

- a) nature of the concepts themselves; and
- b) thinking process used by individual to learn concepts
- a) Nature of Concepts

A concept is assumed to be a set of specific objects or events, which share common characteristics and they can be labelled as a particular name. So the identification of generalized concept attributes to newly encountered examples and discriminate examples from non-examples is concept learning.

b) Thinking Strategies of Concept Attainment

Bruner analyses any concept as having five elements.

- i) Name-It is a term given to the category.
- ii) Examples-They refer to the instances of the concept. Examples of a concept may be positive or negative.
- iii) Attributes-The basic characteristics of the concepts are called attributes. Each attribute has an attribute value.
- iv) Attribute Value-This refers to the specific content of that category of concept. Most attributes have a range of accepted value.
- v) The rule is a definition or statement of specifying the essential attributes of a concept (A. I. O. U., 2002).

His approach was characterised by three stages which he calls enactive, iconic and symbolic for the formation of concepts. The first, the enactive level, is where the child directly manipulates the matter. The second is the iconic level, where he deals with mental images of objects but still he is not able to manipulate them directly. The third is the symbolic level, where he is strictly manipulating symbols and mental images or objects are no longer in use. The optimum learning process takes place by these stages.

1. Enactive Stage. Infants are in the enactive stage and acquire knowledge by actively engaging in activities. Young children need lots of opportunities to engage in “hands-on” activities with a variety of objects if they are to learn effectively.

2. Iconic Stage. In the iconic stage, children learn through visual stimuli (the word icon means “picture”). At this stage, children rely on visual representations to aid their thinking. Students’ visual representations determine how they understand the world.

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Teachers of students in the early grades should use many pictures and visual aids to promote learning.

3. Symbolic Stage. In the symbolic stage, children can understand symbols, including words and mathematical and scientific notations. Once students have reached the symbolic stage, they are able to take in large amounts and varied types of information. Symbolic material includes written passages, scientific and mathematical formulas and abstract charts (Crowl, Kaminsky and Podell, 1997).

Bruner advocates the use of guided discovery in which the teacher guides students to induce the underlying structure of the material that they are studying (Crowl, Kaminsky and Podell, 1997).

According to Hollyman (2009), Bruner suggested that people remember things “due to meaning and signification, not toward the end of somehow ‘preserving’ the facts themselves.” A constant theme in Bruner’s work is that education is a process of discovery. Bruner believes that personal discovery is involved in effective learning. Bruner advocated that if opportunities are provided to the students to pursue concepts on their own pace, then a chance of better understanding will be increased. Within the education system, a teacher should engage students in discussion and guide them so that students become able to think independently rather than be taught. He argued that the study materials, activities and tools that are matched to and capitalise their developing cognitive capabilities should be provided to the students for maximum learning.

Summary

All the philosophers, thinkers and psychologists argue that concept formation is better for clarification and formation of ideas. Teachers should use it to improve the academic achievement of students. It may be used for changing the old and useless conceptions to new and plausible conceptions. When the goal of instruction is meaningful learning, one of the powerful tool to use may be concept formation. This model facilitates the integration of the existing and new knowledge. The integration would result in meaning learning if the cognitive structure of the learner’s pre-existing knowledge is relevant.

Concept formation is better to change the traditional classroom environment in which students use their knowledge for solving their problems. When students know how to use their existing knowledge, they are able to solve the real life problems and develop complex skills and concepts. Science teaching should favor procedural knowledge. Although the declarative knowledge is also very important, it is not enough.

It is very useful for conceptual change. Conceptual change is important for developing and strengthening the concepts. By this model, teachers can easily teach

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complex concepts. Because of this, teacher education should place emphasis on conceptual change.

By this, teachers should be trained to develop and assess effective concepts. Effective concepts are considered as an important tool of instruction, but it also requires some training for teachers. Teachers should also be trained in the techniques of demonstration. Demonstrations should never be replaced by hands-on activities; they should not be longer than 5 minutes in a class period. So, it is important for teacher to know the idea behind using demonstration and how to integrate them with their teaching. Teachers should conduct experiments in the laboratory as required or even in the classroom if possible. Teachers should have practice to handle the apparatus.

The important area of concept formation is to avoid the traditional ways of assigning home work. Home task should be assigned in such a way by which the teacher evaluates the students' understanding of concepts. By this, if the students have any inquiry or confusion, the teachers should clear it in the beginning of the next day lecture. Different styles should be used for assigning the home task.

Concept formation put emphasis on the training of teachers in test construction techniques. Teachers should assess knowledge, understanding and application level of the students in one test. Teachers should be aware about the new methods of testing the students.

Concept formation is helpful in better understanding of concepts and helpful to cope with the problematic situations of future life.

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