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INNOVATIVE APPROCHES TO PROMOTE SCIENCE EDUCATION THROUGH CONSTRUCTIVIST APPROACH

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SUMMARY: The Indian education system was influenced by the behaviorism but the latest catchword in educational circle is constructivism. So it is basic the teaching process should centered. I'he opportunity and facility should be given lo generate new knowledge, I'orthai the teacher should be well acquainted about style or types of learners.

Constructivism in Science teaching

Constructivism has evolved from the cognitive psychology. Constructivism of paradigm is based upon the contribution of Paget, Lev Ygotosky, Bruner Howard Gardner and Nelson goodman. The reflective thinking of John Dewey has influenced constructivism.

Discussions of the topics such as Constructivist learning pedagogy knowledge and teacher education dominate scholarly and practitioner journals in education, including teacher education. Further, costructivist approaches are reflected in national and state level policy documents, particularly those designed to influence curriculum and pedagogy, e.g.National Curriculum Framework (NCF) 2005 brought out by NCERT has vividly exemplified as how to design constructivist learning situation in basic school subjects and the role of the teacher in the process of organizing experiences, knowledge construction and evaluation etc. (NCERT,2005,pp-13-34). Following the basic principles and approaches enshrined in the NCF-2005 many state governments have prepared/are preparing their own curriculum frameworks and textbooks. The major concern in the curriculum and text book renewal process undertaken by the State governments, however, is to reflect constructivist principles and methods in teaching-learning process. These shifts, currently taking place in Indian.

The term "Costructivism" refers to the idea that individuals, through their interaction with the environment, construct their own knowledge and meaning (Fosnot-1996, Steffe and Gale, 1995) The previous knowledge as the base or the plinth of the building on which he can construct his own knowledge or the meaning. Here in this case he may construct some new ideas, thoughts, information or knowledge or modify his old concept, ideas. He may accept his assumptions or throw it the old one. Here in constructvist approach child shows higher levels of thinking skills of cognitive domain e.g.application, attitude, synthesis, analysis and evaluation. His role is creator or the developer.

Constructivist Pedagogy

1.Learning should take place in real world environments.

2.Learning should involve social negotiation and meditation.

3.Content and skills should be made relevant to the learner.

4.Content and skills should e understood within the framework of the learner's prior knowledge.

5.Students should be assessed formatively, serving to inform future learning.

6.Students should be encourage to becomes self-regulatory, self-mediated, and self aware.

7.Teachers serve primarily as guides and facilitators of learning, not instructors.

8.Teachers should provide for an encourage multiple perspective and representation of content.

Basic Assumption for incorporating constructivism

The assumptions for constructivism

1.Knowledge is constructed from the experience.

2.Learning is personal interpretation of the world.

3.Learning is an active process in which meaning is developed on the basis of experience.

4.Conceptual growth comes from the negotiation of meaning, sharing of multiple perspectives and the changing of our internal representations through collaborative learning.

5.Learning should be situated in realistic settings, testing should be integrated with the task and not a separate activity (Merril, 1991, in Smorgansbord, 1997, Cied in the Constructivism)

Process of construction of knowledge

In learning, sensation – perception concept formation-imagination and thinking are the various mental process involved and all these mental processes are interdependent. If the sensation is proper through the effective use of sense organs from the strong stimuli, then the perception will be fair and if perception is vivid then there will be formation of crystal clear concepts. Concept formation is the initial stage of the construction of knowledge. While

helping the students in the classroom teacher should show many things to the students so that they can observe it carefully. So first step towards construction of knowledge is the observation here teacher can use power point presentation, movies, animation, simulation obviously second step individual where he constructs new ideas or concepts based on prior knowledge or experience is constructivism, H is a radical departure in thought about the nature of knowledge, hence of learning and thus to teaching. It describes learning as a chance in meaning constructed from experience.

Types of learner

Visual Learner

- Learn through teachers gestures.
- Front benchers to avoid obstacles in observating.
- The useful teaching aids, pictures, video clips, handouts etc.

Auditory Learners

- Learn through lecture, discussion & by the observation of verbal behavior of people.
- Learn through intensity of voice, speed, styles etc.
- Less importance to written material, audio, video cassettes useful.

Kinesthetic Learners

- Learn through touching the material world by their own hands.
- Constraints are occurred due to their movement and explorations.

Constructivist principles of learning

1. Learner should be encouraged to raise questions, generate hypotheses and test their validity.
2. Learner should be challenged by ideas and experiences that generate inner cognitive conflict or disequilibrium. Student's error should be viewed positively as opportunities for learners and teachers to explore conceptual understandings.
3. Students should be given time to engage in reflection, journal writing, drawing, modeling and discussions. Learning occurs through reflective observations.
4. Lerning environment should provide ample opportunity for dialogue and the classroom should be seen as a community of discourse engaged in activity, reflection and conversation. (Fosnot-1989)
5. Students themselves must communicate their ideas to others, defend and justify them.
6. Studnets should work with big ideas central organizing principles that have the power to generalize across experiences and disciplines.

From Conventional Approach	**To**	**Constructivist Approach**
∗ From rigid process of knowledge building	→	∗ Flexible process of knowledge building
∗ Teacher's centered approach	→	∗ Student's learning autonomy approach
∗ Teachers role – guiding and monitoring	→	∗ Teachers role – facilitating, supporting and encouraging
∗ Students role learning	→	∗ Students active learning
∗ Classroom restricted learning	→	∗ Learning through wide and social context – scope fully
∗ Teachers restricted knowledge	→	∗ Students evolutionary knowledge generation from though process
∗Unidiciplinary approach	→	∗Multi disciplinary approach
∗ Traditional Evaluation	→	∗ Continues evaluation

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