

Each Child Can Construct Knowledge

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Abstract

It was assumed earlier that teachers impart information to their students who process the information with the help of their cognitive structure and learn. Learning therefore, moves from outside to inside the learners. Learners cannot construct knowledge on their own. Students were considered as blank slate upon which the teacher etches information. Over the years brain research has provided more light on how learners learn. Constructivism on the other hand, highlights that each learner can construct knowledge on her/his own. Constructivism has brought about a dramatic change in the role of teachers and learners. The main task of the teacher in the constructivist classroom is to pose problem(s) to her/his learners and to support them in solving the problem thereby helping them to construct knowledge. Similarly, the role of learner is to create knowledge rather than to ingest mechanically transmitted communicated by the teacher. Though constructivism is the theory of learning but certain pedagogical implications have been derived from the theory. Teachers need to use the instructional approaches such as dialogue, cooperative learning, peer tutoring, cognitive dissonance and problem-based learning to support their learners in constructing knowledge on their own and to develop creative thinking, critical thinking, problem solving and independent thinking skills essential for a true citizen of 21st century. However, there are issues in the constructivist pedagogy which need to be addressed to popularise the pedagogy. Teachers experience difficulty in transforming the content to be learnt by their students into problem(s) to be solved by them. Secondly the use of the said instructional approaches is a time consuming process. Teachers report that they cannot transact the syllabus of a subject within the prescribed time frame if they follow said instructional approaches.

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BACKDROP**Learning moves from outside to inside the learner**

Teaching process is predominantly didactic in Indian classrooms. The classroom is a place where the teacher pours information into her/his passive students as if they are empty vessels to be filled up. Students mechanically ingest information transmitted by the teacher in the classroom. Students are considered as blank slate upon which the teacher etches information related to different subjects transacted by him/her in the class.

When information is transmitted to the students by the teacher in the classroom, they perceive the information and process the same with the help of knowledge in their cognitive structure. The students then integrate it with the existing knowledge in their cognitive structure. It is assumed that students gain knowledge either from the teacher or reading on their own from the textbook. It is therefore assumed that the learning moves from the outside to inside the learner.

CONCEPT OF CONSTRUCTIVISM

Constructivism is a theory of learning. It does not agree with the notion that learning moves from outside the learner to inside the learner. It specifies that a learner constructs knowledge on his/her own by interacting with the environment in which he/she is

placed. Further it highlights that the knowledge so constructed is deeper, richer and more sustainable. Teachers should therefore, use constructivist approach in teaching learning process in their classroom. It facilitates the process of developing among learners the skill of learning to learn. Therefore, there is a paradigm shift in designing instruction.

Constructivists believe that meaningful learning is possible in an environment in which students are required to solve a problem which they experience in their context and are helped by the teachers in the process. Further when they are provided opportunities to solve the problem collaboratively.

CHANGING ROLE OF BOTH THE TEACHERS AND LEARNERS

Constructivism modifies the role of both of teachers and learners in the teaching-learning process.

Teachers' Role in Constructivist Classroom

The teachers instead of pouring information into passive students help them to construct knowledge. The constructivist teacher develops in his/her learners' problem-solving and inquiry based learning skills. He/she triggers students' innate curiosity about the world and how things work. Constructivist teacher poses questions and problems to students and helps them to solve the problem/find their own answers to the questions.

The constructivist teachers lay a great deal of emphasis on reflection and collaboration in the process of helping students to construct knowledge on their own. The teacher creates situation(s) in the classroom where students feel comfortable to ask questions and they reflect on their learning processes either alone or in groups. Students talk about what they learned and how they learnt. This is invaluable for developing the skill of learning to learn. The teachers also rely heavily on collaboration among students in the learning process. Students study together, discuss and exchange their ideas. Students learn not from themselves, but also from their peers.

Students' Role in the Constructivist Classroom

In the constructivist classroom, the role of students is altogether different from that of a traditional classroom. Instead of students being passive recipients of information communicated by the teacher, they are active participants in the teaching learning process.

Students Role in the Constructivist Classroom

Students' role too is different in the constructivist classroom from that in a traditional classroom. In the latter classroom, S/He is required to perceive and receive information transmitted by the teacher. S/He is not a passive listener. In the constructivist classroom,

she/he is an active participant in the learning process. Rather s/he is constructing knowledge on her/his own by solving problem(s) posed by the teacher by interacting with peers and the teacher. S/He seeks the help of the teacher when s/he is fronted with a difficulty in solving the problem.

PEDAGOGICAL IMPLICATIONS

Through constructivism is a theory of learning, a few pedagogical implications have been derived from this theory to improve the teaching-learning process in the classroom thereby developing among learners the requisite knowledge and skills essential for a 21st century citizen. These are:

Dialogue

The dialogue provides an opportunity to learners to discuss and exchange ideas with their peers as well as with the teacher. The dialogue acts as a catalyst for creation of knowledge. It facilitates comprehension of concepts/principles through exchange of ideas. The dialogue provides an opportunity to students to become active in their learning. This allows the students to ask questions. The class in which there is a dialogue is a lively class.

Cooperative Learning

Constructivism lays a great deal of stress on extensive use of cooperative learning tasks to help learners to construct knowledge. This is because

learning is basically a collaborative process. Cooperative tasks have two types of goals – academic and social. Social goals refer to development among learners' social skills such as criticizing ideas and not people, controlling anger, disagreeing in non-hurtful ways, and listening to others with rapt attention.

The teacher normally forms groups of two to four learners depending upon the complexity of the learning task. There are a number of cooperative learning structures such as think-pair-share, say and switch, graffiti, corner, and jigsaw. Of all these structures, jigsaw strategy is the most popular and is widely used in cooperative learning tasks.

Peer Tutoring

Peer tutoring is a form of cooperative learning. Peer tutoring means students helping other students to learn on an one to one basis. Generally students are paired for mutual learning. At other times, more able students' help less able students of the same age or older students help younger students. When a student is to teach another student, s/he needs to learn the material better in the first place. This contributes to her/his learning on how to learn. In this process, both the students learn better. The use of peer tutoring results in a number of advantages such as enhancement of learners' self-esteem, self-confidence in their abilities and higher academic achievement.

There is a wealth of empirical evidence that peer tutoring/teaching is extremely effective for a wide range of content and students of different levels. Peer teaching increases learning, both of the students being helped as well as those giving the help as a result of their collaborative learning. Students' teaching other students is considered as one of the effective methods of teaching.

Those who teach others, teach themselves, is very true, not only because constant repetition impresses a fact indelibly on the mind, but because the process of teaching in itself gives a deeper insight into the subject taught.

Cognitive Dissonance

Cognitive dissonance is another instructional approach which teachers need to use in the constructivist classroom.

Cognitive dissonance or cognitive conflict arises when the information transmitted by the teacher in the classroom is contradictory to what s/he already knows i.e. the knowledge already in the cognitive structure of the learner. This cognitive conflict stimulates thinking on the part of learners.

Problem-based Learning

The constructivist approach of problem-based learning invaluable in helping learners to reach their highest potential was first implemented in medical education in the early 1970s. The students were

presented a problem in the form of patient entering with symptoms. Students' task was to diagnose the disease from which the patient was suffering. They were required to provide a rationale for their diagnosis. The use of problem-based learning is now widely used in schools, colleges, business schools, architecture and so on etc.

In a school, the teacher transforms the content to be transacted into a problem and presents the same to her/his students to solve. Students discuss the problem in groups, generate hypotheses, try to solve the problem with the help of knowledge and experiences they have. Teacher supports them in solving the problem. Later the groups of students discuss their solutions of the problems in the whole class.

Enduring Issues in the Implementation of Constructivist Pedagogy

There are some important issues with regard to the use of constructivist pedagogy while transacting the curriculum. These

need to be addressed to popularise constructivist approaches to transact the curriculum.

The main activity in a constructivist classroom is solving problems. For this, teachers are required to transform the content to be transacted into a problem to be solved by her/his students. Teachers find it difficult to visualize problems to transact the given content of a subject. Further, it results in extra work on the part of teachers. As a consequence, teachers find it difficult to use constructivist pedagogy to transact the syllabi of different subjects.

Constructivist pedagogy has been largely used by Science and Mathematics teachers. This is because it is based on problem solving and inquiry approach. Therefore it has limited use in transacting other subjects such as Social Science.

Teachers often report that the use of constructivist pedagogy such as problem solving is a time consuming process. As a consequence, it is not possible to transact the syllabus of a subject within the limited time frame.

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