

Constructivism: A Paradigm for Teaching and Learning

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Abstract

The present paper is a conceptual paper focusing on the need and ways of adopting constructivism in the teaching and learning process. Our present education system emphasizes on preparing students for highly competitive standardized tests and overlooks the importance of fostering critical thinking skills in our students. The conventional teacher centric teaching learning process emphasizing on memorization is usually adopted across length and breadth of Indian schools. This paper sketches the need to redefine education to include more critical thinking by adopting constructivist pedagogy. The paper also proposes the important aspects such as integration of social and emotional learning in learning process for adoption of constructivism in classrooms, besides this it also outlines the learning strategies and learning design required for successful implementation of constructivism in teaching learning process.

Keywords: Constructivism; Zone of proximal development; Social and emotional learning

Introduction

Education involves the process of the development and learning of the child on multiple dimensions, facilitated by the teacher, who is guided by a curriculum. Effective education is a process where the teacher, children and the schools involved and participated actively [1]. However our present education system emphasizes on preparing students for tests and don't foster deep learning and is in the midst of a crisis of quality-starting from primary schools to universities, the dominant view is that our students are not learning as much as they ideally should and what is more worrisome is that rote learning and memorization seems to be the dominant mode at all levels. Traditional teaching approach (lecture method) commonly adopted by teachers in Indian schools involves coverage of the context and rote memorization on the part of the students and does not involve students in creative thinking and participation in the creative part of activities. Most of the time, during teaching learning process, instruction remains unilateral which is considered to be an orthodox activity. The upcoming trends in education changed the present scenario and adopted the constructivist approach which is moral and more focused on innovative activities and knowledge acquisition and therefore, the academic results of the students of constructivist classrooms are better than traditional classrooms. It was found that constructivist instructed students had higher scores than the students who were exposed to conventional method of teaching. The problem lies in the learning environment in a conventional classrooms, the classroom environment is teacher centered which makes learning process boring for less competent students. Student's attention wanes frequently and they are not able to retain the information for long time period and are often caught daydreaming, talking and pestering other students. The individual differences existing between learners, their background knowledge and learning styles are often ignored in the conventional classrooms. Present educational system provide a unique and standardized teaching material to all learners which tend to benefit to those whose

learning style and background knowledge fits well with the teaching material. If the teaching style closely matches the students preferred style of acquiring knowledge, learning becomes easier and more natural, results improve and learning time is reduced. In few words, traditional teaching material and strategies generally tend to benefit some students more than others [2].

The NCF, also suggests adopting critical pedagogy because students are not just young people for whom adults should devise solutions. They are critical observers of their own conditions and needs and should be participants in discussion and problem-solving related to their education and future opportunities. Critical pedagogy provides an opportunity to reflect critically on issues in terms of their political, social, economic and moral aspects.

The improvement in learning outcomes is possible by shifting the focus of teaching learning process on concept development and deep understanding. Till now, most of the focus has been to ensure access to education. Therefore, a question arises on the philosophical underpinnings of the long dominant pretest-teach-post teach model of education. Despite completing all their tests, too many students simply are not learning [3].

There arises a need to adopt a new pedagogy which encourages the learner to construct a sense of her own self, the development of her autonomy, alongside her progress within the group for interpersonal growth. Pedagogy is a vehicle of articulating learning goals and identifying the forms of activities that promote development toward those goals. Constructivist pedagogy is one such approach where activities are proposed to students that are meaningful for them and the learner reflects, searches, uses her capacity for taking initiatives and for being creative. Constructivist pedagogy in which activity supplements lecture, learners are provided opportunities to construct their own understanding on the basis of an interaction between what they already know.

The need for constructivist approach arises when behaviorism fall short of producing positive effects within the complex context of the classroom and left teachers feeling shortchanged and cheated by a

system that placed the guilt for students' failure to learn in their hands. Following the legacy of behaviorism, constructivism has been welcomed as a theory of knowing that more fully explains the complexity of the teaching-learning process [4].

Need of constructivism

The present article concentrates on providing an alternative pedagogy based on the principles of constructivism theory given by Piaget [5], Vygotsky [6] and other theoreticians including psychologists and sociologists. If we accept constructivist theory, then we have to give up platonic and all subsequent realistic views of epistemology. We have to recognize that there is no such thing as knowledge "out there", independent of the knower but only knowledge we construct for ourselves as we learn is the true knowledge. If we believe that knowledge consists of learning about the real world "out there", then the power of organizing and presenting the knowledge is passed on to the teacher who ultimately passes this on to the learner. In the process of disseminating knowledge to learners the teacher may use activities and opportunities to experiment but here the teacher is helping the learner to understand the world but don't ask the learner to construct his/her own world.

The understanding of the difference between the world "out there" and the students own world helps a teacher to decide the type of pedagogy he will follow to create a constructivist classroom. When the teacher structures situations for his/her students then she is restricting the learners to carry out their own mental actions. These two worlds, the world "out there" and "own world" puts the teacher in a dilemma of presenting the knowledge or to help students to construct their own knowledge. Teacher opting for the second option intensifies her problem because the curriculum designed by the experts, classrooms environment created and followed in a school, instructional design adopted by a teacher and learning habits of the students' needs a major redesigning by the teacher. The theories of learning, strategies of teaching and learning and the pedagogies are the guiding principles in framing an instructional design. The instructional design following constructivist ideology avoids directing a pupil towards a solution to the problem rather it encourages self-conceptualization of the solution. There is a need to develop a learning design using constructivist learning strategies which follows the principles of social constructivism and also aims at developing social and emotional skills in students by using social constructivism in classrooms. Elias et al. [7] defined SEL as the process of acquiring core competencies to recognize and manage emotions, set and achieve positive goals, appreciate the perspectives of others, establish and maintain positive relationships, make responsible decisions, and handle interpersonal situations constructively. The proximal goals of SEL programs are to foster the development of five interrelated sets of cognitive, affective, and behavioral competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision making [8].

Definitions for constructivism in education are as follows

"It is assumed that learners have to construct their own knowledge individually and collectively. Each learner has a tool kit of concepts and skills with which he or she must construct knowledge to solve problems presented by the environment. The role of the community, other learners and teacher is to provide the setting, pose the challenges, and offer the support that will encourage mathematical construction."

"The doctrine itself holds that 'language users must individually construct the meaning of words, phrases, sentences and texts."

"Constructivists allege that it is we who constitute or construct, on the basis of our theorizing or experience, the allegedly unobservable items postulated in our theories."

"The central principles of this approach are that learners can only make sense of new situations in terms of their existing understanding. Learning involves an active process in which learners construct meaning by linking new ideas with their existing knowledge"[4].

Social Constructivism

The most important aspect on which constructivism focuses is knowledge construction. Knowledge construction is viewed differently by different philosophers and psychologists. Jean Piaget's view is constructivist, because he firmly believed that knowledge acquisition is a process of continuous self-construction. Children acquire knowledge through their actions and passes through stages of assimilation, accommodation and equilibrium in the process of knowledge construction. The father of social constructivism, Vygotsky [6] views the origin of knowledge construction as being the social intersection of people, interactions that involve sharing, comparing and debating among learners and mentors. Through a highly interactive process, the social milieu of learning is accorded center stage and learners both refine their own meanings and help others find meaning. In this way knowledge is mutually built. This view is a direct reflection of Vygotsky's [6] sociocultural theory of learning, which accentuates the supportive guidance of mentors as they enable the apprentice learner to achieve successively more complex skill, understanding, and ultimately independent competence [9]. Vygotsky [6] asserted that knowledge can't be isolated from social and cultural context. He argues that all higher mental functions are social in origin and are embedded in the context of sociocultural setting. In social constructivist model, the knowledge is constructed through interaction between teacher and student. The role of teacher in social constructivist approach shifts from the sole dispenser of knowledge to motivator, guide and resource person. Constructivism emphasizes on learner centered, learner directed and collaborative style of teaching learning process in which learning is supported by teacher scaffolding and authentic tasks.

Constructivist Learning Strategies

The constructivist learning strategies can be developed using principles of social constructivism to improve academic achievement, high order thinking skills and social and emotional skills of the students. The constructivist environment in a classroom can be created by adopting the following:

Provide experience with the knowledge construction process

The teacher presents a topic to the learners and guides them to explore the topic through experimentation. The learners are encouraged to frame a research question and teacher helps them to answer the research question framed by them through scaffolding.

Experience in and appreciation for multiple perspectives

All learners are distinct from each other in their way of thinking and so the need arises to look at a problem from multiple perspectives and provide the opportunities to learners to experiment and discuss their alternative ways of thinking. Here, the students are encouraged to

work in groups. Finally, all the groups can share their opinions on the topic with each other.

Provide social and emotional learning

The social and emotional aspects of learning will be taught to the students in an integrated manner. The five aspects of social and emotional learning which could be covered in the teaching are as follows: self-awareness, managing feelings, motivation, empathy and social skills.

Use multiple modes of representation

The multiple modes of representation also assist the goal of experiencing multiple perspectives. Use of multiple media to enrich the learning environment provides the learners to view the topic being discussed in the class from multiple dimensions.

The teacher should prepare a list of media available and supporting the topic. The teacher should also decide the use of media in supporting the authentic nature of the task.

A combination of the following learning strategies can be used by the teachers to create constructivist learning environment

- Use of multimedia/teaching aids
- Scaffolding
- Case studies
- Role playing
- Story telling
- Group discussions/Group activities (reciprocal Learning).
- Probing questions
- Project based learning
- Use of learning strategies for social and emotional learning of students.

The teacher can follow the under mentioned learning design while conducting group work or in general

Situation: A situation will be presented to the students to work upon.

Bridge: The teacher tries to know the existing knowledge level of the students and tries to find out the gap in the existing level and the level where they should reach at the end of discussion. This is carried out with the help of suitable questions and activities.

Grouping: The students are then divided into groups to explore the problem presented in their own perspective. Here the students of varying perspectives will be included in a group.

Questions: The teacher may adopt the strategy of probing questions to assist them move towards their goal.

Exhibit: The students are expected to exhibit or explain their understandings regarding the topic to other students.

Reflections: Students present their reflections on the entire process of building understanding of the topic.

Constructivism: Zone of Proximal Development, Principles and Learning Outcomes

Teachers usually focus on basic literacy routines (reading fluency, note taking structures), skills and test preparation due to the use of standardized testing to measure learning outcomes. This may encourage providing high support to learners and minimize attention

to content knowledge development. Scaffolding comes to the rescue of teachers who want to design activities to link future actions with the present and help learners in development of content knowledge by themselves [10]. Vygotsky [6] also talks about zone of proximal development. He developed concept of zone as an alternative to static, individual testing, namely IQ testing. He asserted on assessment of mental functions through collaborative activities and not independent and isolated activities.

Constructivism, an epistemological view of knowledge acquisition emphasizes on four aspects: 1) knowledge construction rather than knowledge transmission and the recording of information conveyed by others, 2) new learning builds on prior knowledge, 3) learning is enhanced by social interaction and 4) meaningful learning develops through authentic tasks. The role of the learner is conceived as one of building and transforming knowledge [9]. Effective constructivist pedagogy should be based on the following seven principles as these appear to be most common across studies. First, the emphasis is not on memorizing and reproducing knowledge, but not on using and transforming it. Second, acquiring and using knowledge are not separate phases; rather, knowledge is learned by using it. Third, knowledge is used especially to solve problems. Fourth, stimulating students thinking activities and enhancing their metacognitive and self-regulative skills are embedded in the study of content knowledge. Fifth, social interaction has a central role in the learning process. Sixth, assessment of learning is embedded in the learning process. Seventh, students themselves must be involved in the assessment of their learning. The learning outcomes of a constructivist classroom are divided into subject-based, personal transferable, and generic academic outcomes. The learning outcomes measured by traditional examination questions belong to the first category i.e., subject-based outcomes. These are the learning outcomes usually assessed in university courses. However, the personal transferable outcomes, such as independent work, cooperation and communication skills, and using information, as well as the generic academic outcomes, such as thinking critically and synthesizing ideas and information, are learning outcomes that are supposed to be produced along with the subject-based outcomes. However, traditional instruction does not pay much attention to the latter two. It was reported that the students in the constructivist group described their learning in terms of the personal transferable skills and the generic academic outcomes, while the students in the control group (traditional classroom) talked mainly about the subject-based learning outcomes. The subject-based outcomes were roughly equal in both groups, but the transferable and generic academic outcomes were reported more often by the constructivist group students. However, applying constructivist principles in teaching is not an easy task; it requires strong knowledge base in the subject matter domain and teachers need knowledge about the processes of learning.

Constructivist Classroom

Palinscar [11,12] quoted the arguments of Damon [13] who suggested that development of learning requires giving up of current understanding of a concept to reach a new perspective and this might be attained through interaction with peers. On the other hand, learning that doesn't require a transformation of perspective but is characterized as acquiring a new skill might be best attained by working with skillful partners such as adults. The guidance provided by the adult is called scaffolding which is required to help a learner to pass the zone of proximal development. Zone of proximal development is

the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. The common conception of the zone of proximal development presupposes an interaction between a more competent person and a less competent person on a task, such that the less competent person becomes independently proficient at what was initially a jointly accomplished task. The common conception of the zone of proximal development supports or inspires a vision of educational perfection, in which the insightful (or lucky) teacher is able to help a child master, effortlessly and joyfully [14].

A constructivist classroom is identified by the percentage of the time spent on student centered activities and it should be dominated by collaborative learning style. The activity structures studied by Forman et al. indicated that 70% of the class time was spent on student centered activities (155 devoted to study presentations and 55% devoted to pair and small group work) and the rest 30% time was teacher centered, where the teacher's interactions were facilitative rather than directive. On the other side, in a traditional classroom only 1% time is devoted to small group work and the rest of the time is devoted to independent seat work and teacher directed recitation [15,16].

The learning strategies suggested by Taylor and Cox to be included in socially assisted learning environment are: a) use of a reflection board in which members could share publicly their representation of the problem; b) Peer collaboration; c) reflective questioning; d) scaffolding; e) shared ownership; f) quizzes, feedback and rewards; g) daily lessons in the regular classrooms. The learning strategy that facilitates active construction of knowledge includes use of multimedia, Socratic dialogues, scaffolding, and role playing games, simulations, storytelling and case studies.

Further, the pedagogical goals determined to construct a constructivist learning environment are as follows:

- Provide learning experience with the knowledge construction process.
- Provide learning experience in and appreciation for multiple perspectives.
- Embed learning in realistic and relevant contexts.
- Encourage ownership and voice in the learning process.
- Embed learning in social experience.
- Encourage the use of multiple modes of representation.
- Encourage self-awareness of the knowledge construction process.

Conclusion

The focus of education needs to be shifted from placing content in students' knowledge building. If the focus of studying could be turned from filling one's mind to producing knowledge products, students wouldn't need to concentrate on memorization and cramming for examinations. These knowledge products could be in form of essays, term papers, project reports, research papers, videos, posters, slides, portfolios, or whatever products that students might create. In classroom instruction there is a need of integration of formal,

theoretical, practical and self-regulative knowledge. However, in a traditional type of curriculum these different types of knowledge have been treated separately. One of the most important challenges to pedagogy is developing curricula and teaching methods so that true integration of formal, theoretical knowledge and more informal, practical, and self-regulative knowledge may be achieved. The aspect of assessment cannot be left untouched while talking of constructivism as constructivist learning requires an entirely different approach to assessment, an approach that is qualitative in nature. Authentic assessment based on real-life tasks and performance assessment requiring students to complete certain learning assignments represent this type of assessment. The emphasis is on students' learning process and on their meaning making as much as (or even more than) on the final product.

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