Constructivism as an Approach in Teaching-Learning Process

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Abstract

Constructivism is one of the important ideas in education.The impact on how teachers teach and to learn to teach is enormous.For education reform efforts to succeed for all students,they must focus on students.To date,the emphasis on student-centred learning may be constructivism's most important contributions.Constructivism is a psychology-based learning theory that explains how people acquire and learn knowledge.Therefore,it can be directly applied to education.This theory states that people construct knowledge and meaning from their experiences. It also has a philosophical underpinning that emphasize highly on epistemology of problem solving and self-directed learning methods. The paper tries to highlight its approach and implication on teaching-learning process.

Keywords :Constructivism, Teaching-Learning Process, Teaching Theory

Roots and Stems of Constructivism

Constructivism has multiple roots in the psychology and philosophy of tweintieth century. It is rooted in the development perspective of Jean Piaget,the emergence of cognitive psychology under the guidance of figures such as Jerome Bruner and WrickNeisser, the interactional and cultural emphasis of Bruner and Vygotsky,the constructivist perspective of philosophers such as Nelson Goodman.Central to the vision of constructivism is the notion of the organism as "active",not just responding to stimuli, as in the behavioristrubric, but engaging,grappling and seeking to make sense of things (Perkins,1991).Even, there are researchers in fields from science education to educational psychology and instructional technology,who are articulating

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various aspects of the constructivist theory.Moreover,constructivism is only one of the labels used to describe these efforts.Rather than a single theory, constructivism represents a collection of similar approaches which are gaining currency in education and training.They stem from a view of learning more compatible with the ideas of Piaget,Bruner than with information processing.

Definition and Description of Constructivism

Honobein (1996) describes the philosophical paradigm as an approach that asserts that people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences.It is based on the analogy or basis that people form or construct much of what they learn through experience (Hein,1991).Thus,to the constructivist,constructing meaning is learning; there is no other kind.This nullifies the traditional concept of learning in a 'chew,pour,and forget thus,learning because of examination with less or no motivation on the application of the learned experience in real life setting.

To the constructivist,learning occurs only when the learner discovers the knowledge through the spirit of experimentation and doing (Dogru & Kalender,2007).The brain behind this kind of philosophical approach is best described in Confucius, the renowned Chinese philosopher's quote, "I hear and I forget.I see and I remember. I do and I understand". What is the meaning of his statement? If teachers' spoon feed students with knowledge as mother does the weaning child, the students forever will be immature, not having the keen ability to make constructive arguments about issues and drawing tentative conclusions of situations. This soon makes them forget why they were taught. If they witness the carrying out of the phenomen, they may remember through the sensory activity of seeing. The best option which the constructivist philosophers believe and proposes is fully engage the student in the teaching and learning processes so that his engagement would enable him personally discover the knowledge or 'truth'.

Piaget's theory of Cognitive Constructivism

Piaget's theory of constructivism impacts learning curriculum because teachers have to make a curriculum plan which enhances their students' logical and conceptual growth. Teacher must put emphasis on the significant role that experiences – or connections with the adjoining atmosphere play in student education. For example, teachers must bear in mind the role of those fundamental concepts, such as the permanence of objected, plays when it comes to establishing cognitive structures.

Piaget's theory of constructivism argues that people produce knowledge and form meaning based upon their experiences. Piaget's theory covered learning theories, teaching methods and education reform. Two of the key components which create the construction of an individual's new knowledge are accommodation and assimilation. Assimilating causes an individual to incorporate new interferences into the old experiences. This causes the individual to develop new outlooks, rethink what were once misunderstandings, and evaluate what is important, ultimately altering their perceptions. Accommodation on the other hand, is reframing the world and new experiences into the mental capacity already present. Individuals conceive a particular fashion in which the world operates. When things do not operate within that context. They must accommodate and reframing the expectations with the outcomes. Students and their learning.

Apart from learning theories,Piaget's theory of constructivism addresses how learning actually occurs,not focusing on what influences learning.The teacher in this theory functions as facilitators whose role is to aid the student when it comes to their own understanding.This takes away focus from the teacher and lecture puts it upon the student and their learning.The resources and lesson plans that must be initiated for this learning theory take a very different approach toward traditional learning as well.Instead of telling,the teacher must begin asking.Instead of answering questions that only align with curriculum,the facilitator in this case must make it so that students come to the conclusions on their own instead of being told.Also,teachers are continually in conversation with the students,creating the learning experiences that is open to new directions depending upon the needs of the student as the learning progresses.Teachers following Piaget's theory of constructivism must challenge the student by making them effective critical thinkers and not being merely a 'teacher' but also a mentor,a consultant, and a coach.

Vygotsky's theory ofSocial Constructivism

Lev Vygotsky introduced the social constructivism learning theory in 1968.According to social constructivism, children's understanding is shaped not only by their adaptive interactions with the physical world but also by their interactions with other people in relation to a world that is cultural, meaningful, and significant, made so in large part by language. This world is not just physical and perceivable through the senses. The level of potential growth (academic performance), according to Hein (1991), is the degree of development that the learner is capable of achieving with the help of teachers or in cooperation with peers. He views education as a social activity that involves other individuals, such as peers, family members, and even passing acquaintances like those who have gone before. The use of discussion, interpersonal

contact, and the application of information are all recognized as important components of social constructivism's understanding of learning and as ways to accomplish learning goals.

According to Vygotsky, social interaction is essential to human development throughout life and social learning really promotes cognitive growth. In other words, learners may complete any learning task—no matter how challenging—while being guided by an adult or working together with peers. The development of possibilities for students to work together with the instructor and peers in creating knowledge and understanding is supported by this notion. According to Kapur (2018), social production of knowledge occurs in a variety of settings and on numerous platforms.

It might be accomplished through group discussions, teamwork, or any type of pedagogical contact in a place of learning or training, on social media, in a place of worship, or in a marketplace. Students develop knowledge and experience necessary for leading fulfilling lives when they engage with others, the physical and immaterial world, and themselves.Because social constructivism is built on student involvement, discussion, and sharing, it is also known as collaborative learning. A variety of groups and interactive techniques are possible with this teaching style. These could include class-wide talks, discussions in smaller groups, or pairs of students working together on projects or tasks.The fundamental tenet of the theory is that students collaborate in groups to share ideas, brainstorm solutions to problems, find causes and effects, or simply produce something new to supplement prior knowledge.

Commonality in the Two Contrasts: Cognitive and Social Constructivism

According to Cognitive constructivism definition by Irene Chen (2005)who is a renowned machine-learning specialist, "Piaget's theory of cognitive development proposes that human cannot be "given" information which they immediately understand and use. Instead, humans must "construct" their own knowledge. They build their knowledge through experience. Experiences enable them to create schemas – mental models in their heads. The schemas are changed, enlarged and made more sophisticated through complementary processes, assimilation and accommodation".She further defines and contrasts social constructivism by saying, "There is a great deal of overlap between cognitive constructivism and Vygotsky's social constructivist theory.However,Vygotsky's constructivist theory,which is often called social constructivism,has much more room for an active,involved teacher.For Vygotsky the culture gives the child the cognitive tools need for development.The type and quality of those tools determines, to a great extent than they do in Piaget's theory,the pattern and rate of development.Adults such as parents and teachers are conduits for the tools of culture,including language.Today they include electronic forms of information access".

Principles of Constructivism

Following are core Principles of Constructivism:

1. *Knowledge is constructed:* Knowledge is built upon prior knowledge.Students take pieces and put them together in their own self unique way.Building something unique than what another student will build.This is the basic principle of constructivism.The student's previous knowledge,experiences,beliefs and insights are all important basis for their continued learning.

2. *People learn to learn:* Learning involves constructing meaning and systems of meaning.For example,if a student is learning the chronology of dates for a series of historical events, at the same time,they are learning the meaning of chronology. If they are writing a paper about history,they are also learning principles of grammer and writing as well.A simple small thing we learn gives us a better understanding of other things in the future.

3. *Learning is an active process:* Learning encompass sensory input to construct meaning. The learner needs to do something in order to learn,its not a passive activity.They need to engage in the world so that they are vigorously involved in their own learning and development.Learners cannot just sit and expect to be told things and learn,they need to engage in discussions,readings,activities and the like.

4. *Learning is directly linked to our connection with other people*: Our teachers,our family,our peers,and our acquaintances impact our learning.Educators are more likely to be successful as they understand that peer involvement is important in learning.Progressive education recognize that social interaction is key to learning and they use conversation,interaction, group applications to encourage students retain their knowledge.

5. *Learning is contextual:* Students don't learn isolated facts and theories separate from the rest of our lives – We learn in a way connected to things we already know,what we believe and more.The points we tend to remember and the things we learn are connected to the things going on around us.

6. *Knowledge is personal:* Knowledge is a personal matter as constructivism is based on one's own experiences and beliefs.Each person will have their own prior knowledge and experiences to bring to the table.Thus, the way and things people learn and gain from education is very difficult.

7. *Learning exists in the mind:* Hands on experience and physical activity are important for learning,but those elements are not enough. Engaging the mind is key to successful learning.Learning needs to involve activities for the mind,not just the hands.for retaining the knowledge,the mental experiences are needed.

8. *Motivation is key to learning:* Motivation is very important for students to learn.Students are unable to learn if they are not motivated.Educators need to have ways to engage and motivate learn to activate their minds and help them excited about education.Without motivation,its difficult for learners to reach into their past experience and make connections for new learning.

Constructivist Assumption about Learning and Knowledge

Theorists who write in the emerging constructivist tradition often contrast their ideas with epistemological assumptions of the objectivist tradition.Objectivism is the view that knowledge of the world comes about through the individual experience of it.As the experience grows broader and deeper,knowledge is represented in the individual's mind as an even closer approximation of how the world really is.In a sense,then,knowledge is thought to exist independently of learners and learning consists of transferring that knowledge from outside to within the learner.Both behavioural and cognitive information processing theories of learning emerged from the objectivist tradition.That is,information processing as well as behaviourismseparates the individual from his/her environment.The constructivist approach contrasts with theories of education which see knowledge and rules which have been institutionalize by past generations as mind,independent entities in an external environment.Constructivist view knowledge as someone's knowledge.Learning is accomplishedby constructing and elaborating schemas based on experiences.It is very much a personal matter(Wheatley,1991).Constructivist view learning as the adaptations children make in their functioning schemes to neutralize perturbations that arise through interactions with the world(Steffe 1995).Learners,therefore,are not empty vessels waiting to be filled but rather active organism seeking meaning.Regardless of what is being learned,constructive processes operate and learners form,elaborate and test complex mental structures until a satisfactory one emerges (Perkins,1991).Moreover,new particularly conflicting experience will cause perturbations in these structures,so that they must be constructed a new in order to make sense of the new information.Piaget referred to a similar process as schema accommodation and other developmental theorists called it knowledge restructuring.Both Bruner and Vygotsky as well,devised similar concepts to account for the changes in children's knowledge as they develop.

Because constructivists states that each person constructs knowledge for him/ herself and in fact construct their own reality,they have been accused of ignoring the role of social interaction in learning.But this is not true,construction is greatly influenced by others,it might be more representative of radical constructivism to say that individuals construct knowledge.Thus, meanings stem from the consensual domains of individuals,learning is characterized by the subjective reconstruction of societal means

and models through the negotiation of meaning is social interaction (Bauersfeld,1988).Moreover,many constructivist theorists adhere to Vygotsky's notion about the social negotiation of meaning.That is,learners test their own understanding against those of others,notably those of teachers or more advanced peers.Thinking in terms of activities rather than content may be more useful in establishing effective learning environment.Since knowledge involves a learner,it is necessary to consider intentions.Everything that a person does is shaped by intentions and learning events must be seen as intentional."Thought and action must be interpreted in terms of thinker's purpose"(Cobb, Wood, Yackle, Nicholls, Weatley, Trigatti, &Perlwitz,1991).

Constructivist approach to identifying learning goals emphasizes learning in context.Brown et al. (1989),for example argued that learners can usefully deploy should be developed.Moreover,this can only be done in the context of meaningful activity.It is not enough, in other words for students to acquire concepts or routines that lie inert,never to be called upon even in the face of relevant problems to be solved.Instead,knowledge must develop and continue to change with the activity of the learner." Learning is continuous, life -long process resulting from acting in situations"(Brown et al. 1989).In view of this thinking activities the ability to write persuasive essays,engaging in formal reasoning,explaining how data relate to theory in scientific investigation formulate and solve moderately complex problems could be the primary goals of concerns to the constructivist.Spiro et al. (1991)described the need for learners to acquire cognitive flexibility whereas Jonathan Culler, a specialist in semiotics spoke of the need to foster post structuralist thinking.a kind of relative criticism.Critical thinking and mindful considerations are also among those goals thought to be fostered by constructivist pedagogy.

Features of Constructivist Model of Learning

The important features of constructivist model of learning could be summarized as follows in terms of some major works:

1. Knowledge acquisition is a constructive or generative process and each student's knowledge is personal or idiosyncratic (Fisher & Lipson,1986)

2. Misconceptions may originate as a result of student's interaction or experiences with the real world and/or because of his/her misinterpretation of the world of ideas presented to him/her (Driver and Easley,1978).

3. Development of alternative frameworks or misconception is from the same mechanism that leads to the development of conception (Eylon and Linn,1988).

4. Due to their conceptual ecologies,different students can incorporate the same new experiences or ideas differently in their conceptual structure's framework (Jordan,1987)

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5. The process of concept formation is a continuous process of successive approximation and students hold intuitive ideas that are both identifiable and stable,and have enough commonality to make it worth for planning instructional strategies (Clough and Driver,1986).

Analysis of the above features as given by different cognitive psychologists and educators suggests that constructivism emphasizes the importance of each pupil's active role in the construction of knowledge through the interplay of prior learning and new learning.These connections are constructed by the learner themselves.

Researchers and theorists maintain that the key element of constructivist theory is that people learn by constructing their own knowledge,comparing new information with their previous understanding and using this to work through discrepancies to come to new understanding.Tam (2000) lists the following characteristics of constructivist learning environments, which must be considered when implementing constructivist instructional strategies i.e., i) Knowledge will be shared between teachers and students; ii) Teachers and students will share authority; iii) The teacher's role is one of a facilitator or guide and iv) Learning groups will consist of small numbers of heterogeneous students.

Honobein (1996) summarizes what he describes as the seven pedagogical goals of constructivist learning environment as:

i) To provide experience with the knowledge construction process (students determine how they will determine

ii) To provide experience in and appreciation for multiple perspectives (evaluation of alternative solutions)

iii) To embed learning in realistic contexts (authentic tasks)

iv) To encourage ownership and a voice in the learning process (student centered learning).

v) To embed learning in social experience.(collaboration)

vi) To encourage the use of multiple roots of representation (video,audio text,etc.)

vii) To encourage the awareness of the knowledge construction process(reflection,metacognition).

Emphasis on the Learner and Redefining Teaching Methods

In the constructivist theory the emphasis is placed on the learner or the student rather than the teacher or the instructor. It is the learner who interacts with objects and

events and thereby gains an understanding of the features held by such objects or events. The learner therefore constructs his/ her own conceptualizations and solutions of problems. Learner's autonomy and initiative is accepted and encouraged.

Constructivists view learning as the result of mental construction. Students learn by fitting new information together with what they already know. People learn best when they actively construct their own understanding.In constructivists thinking, learning is also affected by the context and the beliefs and attitudes of learners. Learners are encouraged to invent their own solutions and to try out ideas and hypotheses. They are given the opportunity to build on prior knowledge.

A major theme in the theoretical framework of Bruner is that learning is an active process in which learners construct new ideas or concepts based upon their current/ past knowledge. Thelearner selects and transforminformation, construct hypotheses,and makes decisions, relying on a cognitive structure to do so. Cognitive structure (i.e., schema, mental models) provides meaning and organization to experiences and allows the individual to go beyond the information given.

As far as instruction is concerned, the instructor should try to encourage students to discover principles by themselves, the instructor and student should engage in an active dialogue (i.e., Socratic learning). The role of the instructor is to translate information to be learned into a format appropriate to the learner's current stage of understanding. Curriculum should be organized in a spiral manner so that the student continuously build what they already have learned.

Bruner (1996) states that a theory of instruction should address four major aspects.

i)   Predispositions towards learning

ii)   The ways in which a body of knowledge can be structured so that it can be most readily grasped by the learner.

iii)   The most effective sequences in which to present material, and

iv)   The nature and pacing of records and punishments.

According to social constructivism, knowledge is not an individual property but rather a shared experience that arises from social interaction. In the classroom, social constructivism, according to Kelly (2012), might be implemented through the use of case studies, research projects, problem-based learning, brainstorming, collaborative learning/group work, guided discovery learning, simulations, and more. In order to help the groups or pairs understand ideas or accumulate learning experiences in accordance with the planned objectives, the instructor may at times split the class into groups or pair the pupils.

Teaching strategies for social constructivism may be divided into two main categories: discussion and activity/group work.

Discussion-based instruction: According to Omwirhiren (2015), a discussion approach is one that use facilitated interaction to draw attention to a certain topic matter with the intention of assisting the students. Although the approach takes time, according to Jegede (2010), it improves learning by offering students the opportunity to develop their communication skills and mental abilities such as critical thinking, reflective thinking, and assessing differing viewpoints. In this technique, the teacher plays the role of a facilitator. Through thoughtful conversation, the teacher helps the pupils learn by doing. In this teaching strategy, teachers and students discuss a predetermined subject in-depth. Small-group discussions or class-wide discussions can be used for this. The conversation is facilitated by the teacher, and all students are free to express their opinions on a particular issue or subject. To prevent chaos, rules are set up from the outset.

This teaching strategy increases student attention, promotes learning retention, encourages discussion, and engages students as active participants in the course. Students are encouraged to confront one another and freely exchange ideas, which fosters democratic thinking among them. They acquire reflective thinking abilities as a result, which aid in their ability to fully comprehend and evaluate problems. As a result, their ability to communicate with others is enhanced, and they also learn to appreciate and tolerate the opinions of others, even when those opinions are unfavorable to them. Debate, think-pair-share, role playing, brainstorming, field trips, and other socially engaged teaching/learning techniques are all examples of discussion methods. They promote inquiry, critical thinking, the growth of speaking and listening abilities, and the capacity to assess other people's opinions.

Activity/group work-based instruction: Small groups of students collaborate to complete an activity or group project using this type of education. Within the group, each student assumes a position that may be official or informal, and the roles frequently change. It focuses on the contemplation and reasoning of the students as they build their own learning. In other words, it involves figuring out what they already know, what they need to know, and how and where to get fresh knowledge that might help them solve their problem. The teacher's job is to support, direct, and oversee the learning process in order to encourage learning. The instructor wants to increase students' learning while also helping them become more confident in their ability to solve difficulties. Compared to the old, frequently lecture-based methods of teaching and learning, this approach to teaching and learning constitutes a paradigm change. A good illustration of group work is the problem-based teaching and learning approach.

Bell (2010) describes project-based teaching and learning as a cutting-edge method of instruction that imparts a wide range of skills necessary for success in the twenty-first century. With this type of instruction, students learn how to inquire and collaborate to conduct research and produce projects that demonstrate their understanding. Project-based learning is a complete approach to classroom teaching and learning that is created to involve students in exploration of real-world issues, according to Blumenfeld, Soloway, Ronald, Krajcik, Guzdial, and Palincsar (2011).

The Jigsaw is an additional group/activity teaching technique.Jigsaw is a type of guided discovery teaching strategy that makes use of cooperative and collaborative learning methods. Igwe (2018) asserts that the jigsaw teaching technique incorporates the cooperative learning method and its tenets. In this teaching approach, groups of students are formed, and the teacher sets up scenarios that promote student collaboration during the teaching and learning process.Jigsaw are an excellent teaching approach because, according to Ike (2016), each student's success is necessary for the success of the group. This forces the group to function as a cohesive one in order to succeed.

Constructivism as Favourable Conditioning for Impactful Classroom Processes

Social constructivism clarifies the teacher's position in the teaching/learning process, which supports instructional pedagogy. This suggests that educators should use instruction strategies that are: learner-centered,collaborative in nature and instructor-guided. In learner-centered approach the pupils are prioritized over the instructor. This implies that the students are asked to actively participate in their own learning process. They are free to develop their own concepts, inquiries, explanations, and make-ups.In the sense of collaboration learning through social/ peer contactsis prioritized. Students are required to collaborate in groups to solve issues, research, and examine subjects and situations in order to draw conclusions. By doing this, people independently find information or create it.Instructor guide the whole process in social constructivist classrooms. Peer contact takes the form of collaborative learning, which is managed and organized by the instructor. The presentation of certain ideas, issues, or situations can start a discussion. The discussion is then steered by well-placed questions, the introduction and explanation of ideas and information, and allusions to previously studied material.

This new role of teacher is highly effective on how pupils' learning experiences as they no longer sit down to be lectured to or given information by the instructor as in traditional classrooms. Rather they learn by doing as they respond to the teacher's prompts, such as questions, assignments, project work, and the like. Further, in order to collaborate effectively or engage in cooperative learning, students are now taught to

work in groups that the instructor has established.As they share and expand upon their prior experiences to produce new information, they become co-custodians of knowledge.They take ownership of their learning by contributing actively to the process and working together. By valuing and examining fresh perspectives and lessons learned from their peers, students should learn to take into account the opinions of others. They should respect each event, take lessons from it, and be willing to share with their groups in order to continually develop their cognitive capacity.

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