



Waymade Window

A Newsletter from Waymade College of Education

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**"We don't describe the world we see;
we see the world we can describe."**

**Hello Friends!
Greetings from Waymakers...**

As we all know, today 'Constructivism' is the buzz word in educational circles. But it is not something new. It had been there in the ideas of John Dewey, in the works of Jean Piaget and Lev Vygotsky and now educationists across the world today are trying to put that theory, or rather a philosophy, into practice. In India also various commissions have been prescribing integration and inculcation of 'Constructivism' in education at all levels.

Our effort in this edition of our newsletter is to focus on the concept of 'Constructivism' in education, present views of Jean Piaget and Lev Vygotsky, how to integrate the principles laid down in planning teaching and thereby practicing becoming a Constructivist Teacher.

In this edition we have tried to present an overview of 'Constructivism' to give a bird's eye view to teachers and scholars into the philosophy and in the coming editions we plan to focus on individual subject areas wherein 'Constructivism' can be applied and practiced in a beneficial way. We hope our small yet sincere effort will propel our education system towards qualitative development.

We hope our endeavour receives positive and overwhelming response from the readers as positive reinforcement intrinsically motivates individuals to work towards achieving perfection!

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CONSTRUCTIVISM

What is constructivism?

Constructivism is basically a theory, based on observation and scientific study, about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences.

Constructivism is learner-centered; it proposes that learning environments should support multiple perspectives or interpretations of reality, knowledge construction, context-rich, experience-based activities. Constructivism focuses on knowledge construction, not knowledge reproduction. It is a belief that one constructs knowledge from one's experiences, mental structures, and beliefs that are used to interpret objects and events.

The mind is instrumental and essential in interpreting events, objects, and perspectives on the base that is personal and individualistic. Our view of the external world differs from others because of our unique set of experiences.



Constructivism is grounded in the work of *Jean Piaget* and *Lev Vygotsky*. Piagetian perspective suggests that when individual work together, socio-cognitive conflict occurs and creates cognitive disequilibrium that stimulates perspective taking ability (ability to understand how a situation appears to other people) and reasoning. *Vygotsky's* theory presents knowledge as a societal product and emphasizes over the importance of discussion and problem solving among peers.

Cognitive Constructivism

Cognitive constructivism is based on work of *Jean Piaget*. Piaget's theory has two major parts: "ages and stages", which predicts what children can and cannot understand at different ages, and a theory of development that describes how children develop cognitive abilities. The theory of development is the major foundation of cognitive constructivist approaches to teaching and learning. Piaget's theory of cognitive development suggests that humans cannot be "given" information which they automatically understand and use, they must "construct" their own knowledge. They have to build their knowledge through experience. Experience allows them to create mental images in their head.

In Piaget's theory, individuals are seen as revising their ways of thinking to provide a better fit with reality when faced with discrepancies between their own ways of viewing the world and new information. This the individuals do by making the use of the processes of assimilation, accommodation and equilibration. According to Piaget, assimilation refers to the ability to explain events based on available cognitive constructions or current schemas. Schemas are referred to the organization of knowledge attained through exploration and adaptation and with changes through the stages of development, becoming more complex as one progresses.

Accommodation refers to the ability to change the cognitive construction of schemas to make meaning of surroundings of the natural world. Equilibration is the process of moving back and forth between disequilibrium and equilibrium and where equilibrium refers to a sense of stability or comfort that is achieved through the process of adaptation (assimilation and accommodation) of new information experienced in daily life.

According to *Piaget*, when an individual comes under the influence of social interaction, it incites a cognitive conflict within the individual which results in efforts to reestablish equilibrium. Individuals have their own unique schemas of knowledge or events they have interpreted based on their own ability of cognitive construction. For developing further, individuals require dissatisfaction with one's current understanding of a problem or a change in perspective. This is possible only through social interaction when during interaction cognitive conflict occurs between peers who have different answers to the same question. Social interaction then contributes to directing the individual to accept another view through presentation of the alternatives and consideration of the merits of each. Social influence fosters change through the induction of cognitive conflict and the logical operations carried out by individuals attempting to reconcile their differing views to achieve equilibrium of understanding.

Piaget thus, emphasized cooperation as the ideal form of social interaction promoting development because he believed that the social relations involved in cooperation are the same as the logical relations the children construct in regard to the physical world.

Social Constructivism

Social constructivism is a theory developed by psychologist *Lev Vygotsky*. Vygotsky's theory is very similar to Piaget's assumptions about how children learn, but Vygotsky placed more emphasis on the social context of learning. It stressed the fundamental role of social interaction in the development of cognition as Vygotsky strongly believed that community plays a central role in the process of "making meaning". Unlike Piaget's notion that children development must necessarily precede their learning, Vygotsky argued that learning is a necessary and universal aspect of the process of developing culturally organized, specifically human psychological function. In other words, social learning tends to precede development. Vygotsky contended that learning and development are intertwined from the first day of life and learning cannot be matched to stages but must be determined by assessment of two developmental levels-



(a) Actual developmental level , (b) The zone of proximal development

The Zone of Proximal Development (ZPD) is the "space" where a MKO (More Knowledgeable Other) viz. teachers, parents and peers may influence the individual's development.

The MKO: The More Knowledgeable Other is somewhat self-explanatory. It refers to someone who has a better understanding or a higher ability level than the learner, with respect to a particular task, process or concept. Although the implication is that the MKO is a teacher or an older adult, this is not necessarily the case. Many times, a child's peer or an adult's children may be the individuals with more knowledge or experience. In fact, the MKO need not be a person at all. Nowadays, electronic tutors are also being used in educational settings to facilitate and guide students through the learning process. The key to MKOs is that they should have (or be programmed with) more knowledge about the topic being learned than the learner does.

The ZPD: The concept of More Knowledgeable Other is integrally related to the second important principle of Vygotsky's work, the Zone of Proximal Development. Taken together, the MKO and ZPD form the basis of the scaffolding component of the cognitive apprenticeship model of instruction. *Vygotsky* defined the ZPD as the distance between the actual development level as determined through problem solving under adult guidance or in collaboration with more capable peers. He believed that when a student is at the ZPD for a particular task, providing the appropriate assistance (scaffolding) gives the student enough of a "boost" to achieve the task. Once, the student, with the benefit of scaffolding masters the task, the scaffolding can then be removed and the student would then be able to complete the task again on his own.

Vygotsky's model for the mechanism through which social interaction facilitates cognitive development resembles apprenticeship, just like fresh medical graduates are required to carry out their apprenticeship under their seniors, in which a novice works closely with an expert in joint problem solving in the zone of proximal development. The novice is thereby able to participate in skills beyond those that he or she is independently capable of handling. Development builds on the internalization by the novice of the shared cognitive processes, appropriating what was carried out in collaboration to extend the existing knowledge and skills. Thus, according to *Vygotsky*, the true direction of the development of thinking is not from the individual to the socialized, but from the social to the individual and in this language as a tool plays a significant role.

Principles of Constructivism

Here are 10 basic guiding principles of constructivist thinking that educators must keep in mind:

It takes time to learn: Learning is not instantaneous. For significant learning we need to revisit ideas, ponder them, try them out, play with them and use them. This cannot happen in 5-10 minutes.

Learning is an active process in which the learner uses sensory input and constructs meaning out of it:

People learn to learn as they learn: Learning consists both of constructing meaning and constructing systems of meaning. Each meaning we construct makes us better able to give meaning to other sensations which can fit a similar pattern.

The crucial action of constructing meaning is mental: It happens in the mind. We need to provide activities which engage the mind as well as the hands.

Learning involves language: The language we use influences learning. People talk to themselves as they learn, and language and learning are inextricably intertwined.

Learning is a social activity: Our learning is intimately associated with our connection with other human beings, our teachers, our peers, and our family. Conversations, interaction with others and collaborations are an integral aspect of learning.

Learning is contextual: We do not learn isolated facts and theories in some abstract ethereal land of the mind separate from rest of our lives. We learn in relationship to what else we know, what we believe, our prejudices and our fears.

One needs knowledge to learn: It is not possible to assimilate new knowledge without having some structure developed from previous knowledge to build on. The more we know the more we can learn.

Learning is not the passive acceptance of knowledge which exists "out there". Learning involves the learner engaging with the world and extracting meaning from his/her experiences.

Motivation is a key component in learning. Not only is the case that motivation helps learning, it is essential for learning.

CONSTRUCTIVISM IN THE CLASSROOM

In the classroom, the constructivist view of learning can point towards a number of different teaching practices. In the most general sense, it usually means encouraging students to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing. The teacher makes sure he/she understands the students' preexisting conceptions, and guides the activity to address them and then build on them.



Constructivist teachers encourage students to constantly assess how the activity is helping them gain understanding. By questioning themselves and their strategies, students in the constructivist classroom ideally become "expert learners." This gives them ever-broadening tools to keep learning. With a well-planned classroom environment, the students learn HOW TO LEARN. When they continuously reflect on their experiences, students find their ideas gaining in complexity and power, and they develop increasingly strong abilities to integrate new information. One of the teacher's main roles becomes to encourage this learning and reflection process.

For example: Groups of students in a science class are discussing a problem in physics. Though the teacher knows the "answer" to the problem, s/he focuses on helping students restate their questions in useful ways. S/he prompts each student to reflect on and examine his or her current knowledge. When one of the students comes up with the relevant concept, the teacher seizes upon it, and indicates to the group that this might be a fruitful avenue for them to explore. They design and perform relevant experiments. Afterward, the students and teacher talk about what they have learned, and how their observations and experiments helped (or did not help) them to better understand the concept.

Constructivism does not dismiss the active role of the teacher or the value of expert knowledge. Constructivism modifies that role, so that teachers help students to construct knowledge rather than to reproduce a series of facts. The constructivist teacher provides tools such as problem-solving and inquiry-based learning activities with which students formulate and test their ideas, draw conclusions and inferences, and pool and convey their knowledge in a collaborative learning environment. Constructivism transforms the student from a passive recipient of information to an active participant in the learning process. Always guided by the teacher, students construct their knowledge actively rather than just mechanically ingesting knowledge from the teacher or the textbook.



Constructivism is also often misunderstood as a learning theory that compels students to "reinvent the wheel." In fact, constructivism taps into and triggers the student's innate curiosity about the world and how things work. Students do not reinvent the wheel but, rather, attempt to understand how it turns, how it functions. They become engaged by applying their existing knowledge and real-world experience, learning to hypothesize, testing their theories, and ultimately drawing conclusions from their findings.

The search for understanding motivates students to learn found that, when students want to know more about an idea, a topic, or an entire discipline, they put more cognitive energy into classroom investigations and discussions and study more on their own.

Brooks and Brooks identified five central tenets of constructivism that can be answered to the guiding questions for application in the classroom.

1. How might student's entry points be identified?

Constructivist teachers seek and value students' points of view. Knowing what students think about concepts helps teachers formulate classroom lessons and differentiate instruction on the basis of students' needs and interests.

2. What is involved in structuring the experiences that will build bridges from present understanding to new understanding?

Constructivist teachers structure lessons to challenge students' suppositions. All students, whether they are 5 or 50, come to the classroom with life experiences that shape their views about how their world works. When educators permit students to construct knowledge that challenges their current suppositions, learning occurs. Only through asking students what they think they know, and why they think they know it, the teachers and the students are able to comfort their suppositions.

3. How might the selection of projects pose questions that relate to students' real-life experiences?

Constructivist teachers recognize that students must attach relevance to the curriculum. As students see relevance in their daily activities, their interest in learning grows.

4. What are the major concepts that students should understand?

Constructivist teachers structure lessons around big ideas, not small bits of information. Exposing students to wholes first helps them determine the relevant parts as they refine their understanding of the wholes. (Top-Down teaching strategy)

5. How might we move from right/wrong to monitoring students' understanding?

Constructivist teachers assess student learning in the context of daily classroom investigations, not as separate events. Students demonstrate their knowledge every day in a variety of ways. Defining understanding as only that which is capable of being measured by paper-and-pencil assessments administered under strict security perpetuates false and counterproductive myths about academia, intelligence, creativity, accountability, and knowledge.

The following are the visible differences between a traditional classroom and constructivist classroom-

<i>Traditional classroom</i>	<i>Constructivist Classroom</i>
Student primarily work alone.	Students primarily work in groups.
Curriculum is presented part to whole, with emphasis on basic skills. (bottom - up)	Curriculum is presented whole to part with emphasis on the big concept. (top - down)
Strict adherence to a fixed curriculum is highly valued.	Pursuit of student questions is highly valued.
Curricular activities rely heavily on textbooks of data and manipulative materials.	Curricular activities rely heavily on primary sources.
Students are viewed as "blank slates" onto which information is etched by the teacher.	Students are viewed as thinkers with emerging theories about the world.
Teachers generally behave in a didactic manner, disseminating information to students.	Teachers generally behave in an interactive manner mediating the environment for students.
Teachers seek the correct answers to validate student lessons.	Teachers seek the student's point of view in order to understand student learning for use in subsequent conceptions.
Assessment of student learning is viewed as separate from teaching and occurs almost entirely through testing.	Assessment of student learning is interwoven with teaching and occurs through teacher observation of students at work and through exhibitions and portfolios.



CONSTRUCTIVIST TEACHERS DO THE FOLLOWING.. Do You? Reflect upon....

Encourage and accept student autonomy and initiative.

Use raw data and primary sources along with manipulative, interactive, and physical material.

While framing tasks, use cognitive terminology such as classify, analyze, predict, and create

Allow student responses to drive lessons, shift instructional strategies, and alter content.

Inquire about students' understanding of concepts before sharing their own understanding of those concepts.

Encourage students to engage in dialogue, both with them and with other students.

Encourage student inquiry by asking thoughtful, open-ended questions and encourage students to ask questions to each other.

Seek elaboration of students' initial responses.

Allow wait time after posing questions.

Provide time for students to construct relationships and create metaphors.

Follow 5 E's approach-ENGAGE, EXPLORE, EXPLAIN, ELABORATE AND EVALUATE.