

Constructivist Learning

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<http://www3.telus.net/linguisticsissues/constructivist.html>

Only by wrestling with the conditions of the problem at hand, seeking and finding his own solution
(not in isolation but in correspondence with the teacher and other pupils)
does one learn.

~ John Dewey, *How We Think*, 1910 ~

As a philosophy of learning, constructivism can be traced to the eighteenth century and the work of the philosopher Giambattista Vico, who maintained that humans can understand only what they have themselves constructed. A great many philosophers and educationalists have worked with these ideas, but the first major contemporaries to develop a clear idea of what constructivism consists in were Jean Piaget and John Dewey, to name but a few. Part of the discussion that ensues grapples with the major tenets of their philosophies, with a view to shedding light on constructivism and its vital contribution to learning. As a revealing gloss on this issue, it could be said that constructivism takes an interdisciplinary perspective, inasmuch as it draws upon a diversity of psychological, sociological, philosophical, and critical educational theories. In view of this, constructivism is an overarching theory that does not intend to demolish but to reconstruct past and present teaching and learning theories, its concern lying in shedding light on the learner as an important agent in the learning process, rather than in wresting the power from the teacher.

Within the constructivist paradigm, the accent is on the learner rather than the teacher. It is the learner who interacts with his or her environment and thus gains an understanding of its features and characteristics. The learner constructs his own conceptualisations and finds his own solutions to problems, mastering autonomy and

independence. According to constructivism, learning is the result of individual mental construction, whereby the learner learns by dint of matching new against given information and establishing meaningful connections, rather than by internalising mere factoids to be regurgitated later on. In constructivist thinking, learning is inescapably affected by the context and the beliefs and attitudes of the learner. Here, learners are given more latitude in becoming effective problem solvers, identifying and evaluating problems, as well as deciphering ways in which to transfer their learning to these problems.

If a student is able to perform in a problem solving situation, a meaningful learning should then occur because he has constructed an interpretation of how things work using preexisting structures. This is the theory behind Constructivism. By creating a personal interpretation of external ideas and experiences, constructivism allows students the ability to understand how ideas can relate to each other and preexisting knowledge (Janet Drapikowski, personal communication).

The constructivist classroom presents the learner with opportunities for “autopoietic” learning (here, I deploy the meaning of Francisco Varela’s term in a context different to the original one) with a view to helping learners to build on prior knowledge and understand how to construct new knowledge from authentic experience – certainly a view in keeping with Rogers’ *experiential learning* (Rogers, 1969, 1994). C. Rogers, one of the exponents of experiential learning – the tenets of which are inextricably related to, and congruent with, those of constructivism – made the distinction between *cognitive* learning, which he deemed meretricious, and *experiential* learning, which he considered significant. For him, the qualities of experiential learning include:

- personal involvement;
- learner-initiation;
- evaluation by learner; and
- pervasive effects on learner (see the web

document: <http://www.educationau.edu.au/archives/cp/04f.htm>)

Rogers’ humanistic approach to learning is also conducive to personal change and growth, and can facilitate learning, provided that the student participates completely in the learning process and has control over its nature and direction; it is primarily

based upon direct confrontation with practical, social, personal or research problems; and, self-evaluation is the principal method of assessing progress or success. *ibid.*)

Interestingly, contrasting this approach with the typical behaviourist classroom, where students are merely passive “receptacles” of information from the teacher and the textbook, is rather revealing. We will come to that later on in the study. At this juncture, it is important to briefly discuss the theories of John Dewey, Jean Piaget, and Jerome Bruner that have certainly influenced our stance toward the nature of learning and, concomitantly, teaching. For Dewey, knowledge emerges only from situations in which learners have to draw them out of meaningful experiences (see *Democracy and Education*, 1916 and *Experience and Education*, 1938). Further, these situations have to be embedded in a social context, such as a classroom, where students can take part in manipulating materials and, thus, forming a community of learners who construct their knowledge together. Students cannot learn by means of rote memorisation; they can only learn by “directed living,” whereby concrete activities are combined with theory. The obvious implication of Dewey’s theory is that students must be engaged in meaningful activities that induce them to apply the concepts they are trying to learn.

Piaget's constructivism is premised on his view of the psychological development of children. Within his theory, the basis of learning is discovery: ‘To understand is to discover, or reconstruct by rediscovery, and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simply repetition’ (Piaget, 1973). According to Piaget, children go through stages in which they accept ideas they may later discard as wrong. Understanding, therefore, is built up step by step through active participation and involvement. However, applying Piaget’s theory is not so straightforward a task as it may sound.

(see <http://curriculum.calstatela.edu/faculty/psparks/theorists/501const.htm>)

According to Bruner, learning is a social process, whereby students construct new concepts based on current knowledge. The student selects information, constructs hypotheses, and makes decisions, with the aim of integrating new experiences into his

existing mental constructs. It is cognitive structures that provide meaning and organization to experiences and allow learners to transcend the boundaries of the information given. For him, learner independence, fostered through encouraging students to discover new principles of their own accord, lies at the heart of effective education. Moreover, curriculum should be organized in a spiral manner so that students can build upon what they have already learned. In short, the principles that permeate Bruner's theory are the following (see Bruner, 1973):

- Instruction must be commensurate with the experiences that make the student willing and able to learn (readiness).
- Instruction must be structured so that it can be easily understood by the student (spiral organization).
- Instruction should be designed to facilitate extrapolation (going beyond the information given).

It could be argued that constructivism emphasizes the importance of the world knowledge, beliefs, and skills an individual brings to bear on learning. Viewing the construction of new knowledge as a combination of prior learning matched against new information, and readiness to learn, this theory opens up new perspectives, leading individuals to informed choices about what to accept and how to fit it into their existing schemata, as well as what to reject. Recapitulating the main principles of constructivism, we could say that it emphasises learning and not teaching, encourages learner autonomy and personal involvement in learning, looks to learners as incumbents of significant roles and as agents exercising will and purpose, fosters learners' natural curiosity, and also takes account of learners' affect, in terms of their beliefs, attitudes, and motivation. In addition, within constructivist theory, context is accorded significance, as it renders situations and events meaningful and relevant, and provides learners with the opportunity to construct new knowledge from authentic experience. After all,

Learning is contextual: we do not learn isolated facts and theories in some abstract ethereal land of the mind separate from the rest of our lives: we learn in relationship to what else we know, what we believe, our prejudices and our fears. On reflection, it becomes clear that this point is actually a corollary of the idea that learning is active and social. We cannot divorce our learning

from our lives (Hein, 1991, see www.exploratorium.edu/IFI/resources/constructivistlearning.html).

What is more, by providing opportunities for independent thinking, constructivism allows students to take responsibility for their own learning, by framing questions and then analyzing them. Reaching beyond simple factual information, learners are induced to establish connections between ideas and thus to predict, justify, and defend their ideas (adapted from *In Search of Understanding: The Case for Constructivist Classrooms* by Jacqueline G. Brooks and Martin G. Brooks, Alexandria, VA: Association for Supervision and Curriculum Development, 1993).

Having expatiated upon the main tenets of constructivism, let us now content ourselves with juxtaposing constructivism with other theories, objectivist theories that is, and, more specifically, *contiguity theory*. Byrnes (1996) and Arseneau and Rodenburg (1998) contrast objectivist and constructivist approaches to teaching and learning.

Objectivist View	Constructivist View
Knowledge exists outside of individuals and can be transferred from teachers to students.	Knowledge has personal meaning. It is created by individual students.
Students learn what they hear and what they read. If a teacher explains abstract concepts well, students will learn those concepts.	Learners construct their own knowledge by looking for meaning and order; they interpret what they hear, read, and see based on their previous learning and habits. Students who do not have appropriate backgrounds will be unable to accurately “hear” or “see” what is before them.
Learning is successful when students can repeat what was taught.	Learning is successful when students can demonstrate conceptual understanding.

Amongst the din of shifting paradigms, a theory that used to dominate the field but is not well-known is contiguity theory, an exponent of which is E. Guthrie. The classic experimental paradigm for contiguity theory is cats learning to escape from a puzzle box (Guthrie & Horton, 1946). Guthrie used a glass box which allowed him to photograph the movements of cats. These photographs showed that cats learned to repeat the same movements associated with the preceding escape from the box. In this vein, improvement comes about when irrelevant movements are unlearned or not included in successive associations. Drawing upon behaviouristic principles, contiguity theory sets out to show that, in order for conditioning to occur, the organism must actively respond; inasmuch as learning involves the conditioning of specific behaviours, instruction boils down to presenting very specific tasks; exposure to variations in stimulus patterns is necessary in order to produce a generalized response; and the last response in a stimulus-response situation should be correct since it is this one that will be associated (see <http://www.educationau.edu.au/archives/cp/04b.htm>).

Within a positivistic tradition, so to speak, under which come the theories of behaviourism, contiguity theory, and many others, the learner was, and still is, seen as relatively passive, 'simply absorbing information transmitted by a didactic teacher' (Long, 2000: 6). In the universe created by these paradigms, the powerless learner is "worlds apart" from the omniscient and powerful teacher, whose main concern is to 'deliver a standard curriculum and to evaluate stable underlying differences between children' (ibid.). Against this background, the cognitive paradigm of constructivism has been instrumental in shifting the locus of responsibility for learning from the teacher to the learner, who is no longer seen as passive or powerless. The student is viewed as an individual who is active in constructing new knowledge and understanding, while the teacher is seen as a facilitator rather than a "dictator" of learning. Yet, despite its "democratic" nature, many contemporary philosophers and educationalists have tried to demolish or vitiate some of its principles. Such a discussion is outside the remit of this study, of course. We will only briefly mention George Hein (1991, see

www.exploratorium.edu/IFI/resources/constructivistlearning.html), who voices some reservations about constructivist learning.

For Hein, constructivism, although it appears radical on an everyday level, 'is a position which has been frequently adopted ever since people began to ponder epistemology' (ibid.). According to him, if we align ourselves with constructivist theory, which means we are willing to follow in the footsteps of Dewey, Piaget and Vygotsky, among others, then we have to run counter to Platonic views of epistemology. We have to recognize that knowledge is not "out there," independent of the knower, but knowledge is what we construct for ourselves as we learn. Besides, we have to concede that learning is not tantamount to understanding the "true" nature of things, nor is it (as Plato suggested) akin to remembering perfect ideas, 'but rather a personal and social construction of meaning out of the bewildering array of sensations which have no order or structure besides the explanations...which we fabricate for them' (ibid.).

It goes without saying that learners represent a rich array of different backgrounds and ways of thinking and feeling. If the classroom can become a neutral zone where students can exchange their personal views and critically evaluate those of others, each student can build understanding based on empirical evidence. We have no intention of positing methods and techniques for creating a "constructivist classroom." After all, classrooms are, and should be, amenable and sensitive to a whole lot of approaches to teaching and learning, and a slavish adherence to the letter rather than the spirit of education is bound to prove detrimental. It should be borne in mind that the theory of constructivism, with which we have been concerned, is not yet another "educational decree." Like philosophy, constructivism can lead to its own de-construction, in the sense that it forges the very structures and associations that could possibly demolish it. It is a *meta*-theory, in that it fosters a meta-critical awareness. A constructivist orientation to learning is unique because at its heart lies the individual learner *in toto*, rather than dimly perceived "apparitions" of her essence. Constructivism is a modern version of human anatomy, in the sense

that it is based on, and provides insights into, brain mechanisms, mental structures, and willingness to learn.

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