

2. Theory of construction (Constructivism)

Constructivism is ‘**an approach to learning that holds that people actively construct or make their own knowledge and that reality is determined by the experiences of the learner**’ (Elliott et al., 2000, p. 256). In elaborating on constructivists’ ideas, Arends (1998) states that constructivism believes in the **personal construction of meaning by the learner through experience and that meaning is influenced by the interaction of prior knowledge and new events.**

Constructivism is a learning theory that emphasizes **the active role of learners in building their own understanding**. Rather than passively receiving information, learners reflect on their experiences, create mental representations, and incorporate new knowledge into their schemas. This promotes deeper learning and understanding.

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Constructivism Philosophy

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Constructivism’s central idea is **that human learning is constructed, that learners build new knowledge upon the foundation of previous learning.**

This prior knowledge influences what new or modified knowledge an individual will construct from new learning experiences (Phillips, 1995).

Learning is an active process.

The second notion is that learning is an active rather than a passive process.

The passive view of teaching views the learner as ‘an empty vessel’ to be filled with knowledge, whereas constructivism states that learners construct meaning only through active engagement with the world (such as experiments or real-world problem-solving).

Information may be passively received, but understanding cannot be, for it must come from making meaningful connections between prior knowledge, new knowledge, and the processes involved in learning.

John Dewey valued real-life contexts and problems as an educational experience. He believed that if students only passively perceive a problem and do not experience its consequences in a meaningful, emotional, and reflective way, they are unlikely to adapt and revise their habits or construct new habits, or will only do so superficially.

All knowledge is socially constructed.

Learning is a social activity – it is something we do together, in interaction with each other, rather than an abstract concept (Dewey, 1938).

For example, Vygotsky (1978) believed that community plays a central role in the process of “making meaning.” For Vygotsky, the environment in which children grow up will influence how they think and what they think about.

Thus, all teaching and learning is a matter of sharing and negotiating socially constituted knowledge.

For example, Vygotsky (1978) states cognitive development stems from social interactions from guided learning within the zone of proximal development as children and their partners co-construct knowledge.

All knowledge is personal.

Each individual learner has a distinctive point of view, based on existing knowledge and values.

This means that same lesson, teaching or activity may result in different learning by each pupil, as their subjective interpretations differ.

This principle appears to contradict the view the knowledge is socially constructed.

Fox (2001, p. 30) argues:

1. Although individuals have their own personal history of learning, nevertheless they can share in common knowledge, and
2. Although education is a social process powerfully influenced by cultural factors, cultures are made up of sub-cultures, even to the point of being composed of sub-cultures of one.

3. Cultures and their knowledge base are constantly in a process of change and the knowledge stored by individuals is not a rigid copy of some socially constructed template. In learning a culture, each child changes that culture.

Learning exists in the mind

The constructivist theory posits that knowledge can only exist within the human mind, and that it does not have to match any real-world reality (Driscoll, 2000).

Learners will be constantly trying to develop their own individual mental model of the real world from their perceptions of that world.

As they perceive each new experience, learners will continually update their own mental models to reflect the new information, and will, therefore, construct their own interpretation of reality.

Types Of Constructivism

Typically, this continuum is divided into three broad categories: Cognitive constructivism, based on the work of Jean Piaget; social constructivism, based on the work of Lev Vygotsky; and radical constructivism.

According to the GSI Teaching and Resource Center (2015, p.5):

Cognitive constructivism states knowledge is something that is actively constructed by learners based on their existing cognitive structures. Therefore, learning is relative to their stage of cognitive development.

Cognitivist teaching methods aim to assist students in assimilating new information to existing knowledge, and enabling them to make the appropriate modifications to their existing intellectual framework to accommodate that information.

According to social constructivism, learning is a collaborative process, and knowledge develops from individuals' interactions with their culture and society.

Social constructivism was developed by [Lev Vygotsky](#) (1978, p. 57), who suggested that:

Every function in the child's cultural development appears twice: first, on the social level and, later on, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological).

The notion of radical constructivism was developed by Ernst von Glasersfeld (1974) and states that all knowledge is constructed rather than perceived through senses.

Learners construct new knowledge on the foundations of their existing knowledge. However, radical constructivism states that the knowledge individuals create tells us nothing about reality, and only helps us to function in your environment. Thus, knowledge is invented not discovered.

Radical constructivism also argues that there is no way to directly access an objective reality, and that knowledge can only be understood through the individual's subjective interpretation of their experiences.

This theory asserts that individuals create their own understanding of reality, and that their knowledge is always incomplete and subjective.

The humanly constructed reality is all the time being modified and interacting to fit ontological reality, although it can never give a 'true picture' of it. (Ernest, 1994, p. 8)

Social Constructivism	Cognitive Constructivism	Radical Constructivism
Knowledge is created through social interactions and collaboration with others.	Knowledge is constructed through mental processes such as attention, perception, and memory.	Knowledge is constructed by the individual through their subjective experiences and interactions with the world.
The learner is an active participant in the construction of knowledge and learning is a social process.	The learner is an active problem-solver who constructs knowledge through mental processes.	The learner is the sole constructor of knowledge and meaning, and their reality is subjective and constantly evolving.
The teacher facilitates learning by providing	The teacher provides information and resources	The teacher encourages the learner to question and

Social Constructivism	Cognitive Constructivism	Radical Constructivism
opportunities for social interaction and collaboration.	for the learner to construct their own understanding.	reflect on their experiences to construct their own knowledge.
Learning is a social process that involves collaboration, negotiation, and reflection.	Learning is an individual process that involves mental processes such as attention, perception, and memory.	Learning is an individual and subjective process that involves constructing meaning from one's experiences.
Reality is socially constructed and subjective, and there is no one objective truth.	Reality is objective and exists independently of the learner, but the learner constructs their own understanding of it.	Reality is subjective and constantly evolving, and there is no one objective truth.
For example: Collaborative group work in a classroom setting.	For example: Solving a math problem using mental processes.	For example: Reflecting on personal experiences to construct meaning and understanding.

Constructivism Teaching Philosophy

Constructivist learning theory underpins a variety of student-centered teaching methods and techniques which contrast with traditional education, whereby knowledge is simply passively transmitted by teachers to students.

What is the role of the teacher in a constructivist classroom?

Constructivism is a way of teaching where instead of just telling students what to believe, teachers encourage them to think for themselves. This means that teachers need to believe that students are capable of thinking and coming up with their own ideas. Unfortunately, not all teachers believe this yet in America.

The primary responsibility of the teacher is to create a collaborative problem-solving environment where students become active participants in their own learning.

From this perspective, a teacher acts as a facilitator of learning rather than an instructor.

The teacher makes sure he/she understands the students' preexisting conceptions, and guides the activity to address them and then build on them (Oliver, 2000).

Scaffolding is a key feature of effective teaching, where the adult continually adjusts the level of his or her help in response to the learner's level of performance.

In the classroom, scaffolding can include modeling a skill, providing hints or cues, and adapting material or activity (Copple & Bredekamp, 2009).

What are the features of a constructivist classroom?

A constructivist classroom emphasizes active learning, collaboration, viewing a concept or problem from multiple perspectives, reflection, student-centeredness, and authentic assessment to promote meaningful learning and help students construct their own understanding of the world.

Tam (2000) lists the following four basic characteristics of constructivist learning environments, which must be considered when implementing constructivist teaching strategies:

- 1) Knowledge will be shared between teachers and students.
- 2) Teachers and students will share authority.
- 3) The teacher's role is one of a facilitator or guide.
- 4) Learning groups will consist of small numbers of heterogeneous students.

Traditional Classroom	Constructivist Classroom
Strict adherence to a fixed curriculum is highly valued.	Pursuit of student questions and interests is valued.
Learning is based on repetition.	Learning is interactive, building on what the student already knows.
Teacher-centered.	Student-centered.
Teachers disseminate information to students; students are recipients of knowledge (passive learning).	Teachers have a dialogue with students, helping students construct their own knowledge (active learning).
Teacher's role is directive, rooted in authority.	Teacher's role is interactive, rooted in negotiation.
Students work primarily alone (competitive).	Students work primarily in groups (cooperative) and learn from each other.

What are the pedagogical (i.e., teaching) goals of constructivist classrooms?

Honebein (1996) summarizes the seven pedagogical goals of constructivist learning environments:

Brooks and Brooks (1993) list twelve descriptors of constructivist teaching behaviors:

1. Encourage and accept student autonomy and initiative. (p. 103)
2. Use raw data and primary sources, along with manipulative, interactive, and physical materials. (p. 104)
3. When framing tasks, use cognitive terminology such as “classify,” “analyze,” “predict,” and “create.” (p. 104)

4. Allow student responses to drive lessons, shift instructional strategies, and alter content. (p. 105)
5. Inquire about students' understandings of the concepts before sharing [your] own understandings of those concepts. (p. 107)
6. Encourage students to engage in dialogue, both with the teacher and with one another. (p. 108)
7. Encourage student inquiry by asking thoughtful, open-ended questions and encouraging students to ask questions of each other. (p. 110)
8. Seek elaboration of students' initial responses. (p. 111)
9. Engage students in experiences that might engender contradictions to their initial hypotheses and then encourage discussion. (p. 112)
10. Allow wait time after posing questions. (p. 114)
11. Provide time for students to construct relationships and create metaphors. (p. 115)
12. Nurture students' natural curiosity through frequent use of the learning cycle model. (p. 116)

Critical Evaluation

Constructivism promotes a sense of personal agency as students have ownership of their learning and assessment.

The biggest disadvantage is its lack of structure. Some students require highly structured learning environments to be able to reach their potential.

It also removes grading in the traditional way and instead places more value on students evaluating their own progress, which may lead to students falling behind, as without standardized grading teachers may not know which students are struggling.

Summary Tables

Behaviourism	Constructivism
Emphasizes the role of the environment and external factors in behavior	Emphasizes the role of internal mental processes in learning and knowledge creation
Knowledge is gained through external stimuli and observable behaviors	Knowledge is actively constructed by the individual based on their experiences
Teachers are the authority figures who impart knowledge to students	Teachers are facilitators who guide students in constructing their own knowledge
Students are passive receivers of knowledge and respond to rewards/punishments	Students are active participants in constructing their own understanding and knowledge
Observable behavior and measurable outcomes	Internal mental processes, thinking, and reasoning
Evaluation is based on observable behavior and measurable outcomes	Evaluation is based on individual understanding and internal mental processes
Classical and operant conditioning, behavior modification, reinforcement	Problem-based learning, inquiry-based learning, cognitive apprenticeship
Constructivism	Cognitivism

Emphasizes the active role of learners in constructing their own understanding	Emphasizes the role of internal mental processes in learning and the acquisition of knowledge
Knowledge is actively constructed by the learner based on their experiences	Knowledge is a product of internal mental processes and can be objectively measured and assessed
Teachers are facilitators who guide learners in constructing their own knowledge	Teachers are experts who provide knowledge to learners and guide them in developing their cognitive abilities
Students are active participants in constructing their own understanding	Students are receivers of knowledge from teachers and use their cognitive abilities to process information
Active construction of knowledge based on experiences	Internal mental processes and information processing
Evaluation is based on individual understanding and internal mental processes	Evaluation is based on objectively measurable outcomes and mastery of specific knowledge and skills
Problem-based learning, inquiry-based learning, cognitive apprenticeship	Information processing theory, schema theory, metacognition

FAQs

What is constructivism in the philosophy of education?

Constructivism in the philosophy of education is the belief that learners actively construct their own knowledge and understanding of the world through their experiences, interactions, and reflections.

It emphasizes the importance of learner-centered approaches, hands-on activities, and collaborative learning to facilitate meaningful and authentic learning experiences.

How would a constructivist teacher explain $1/3 \div 1/3$?

They might engage students in hands-on activities, such as using manipulatives or visual representations, to explore the concept visually and tangibly.

The teacher would encourage discussions among students, allowing them to share their ideas and perspectives, and guide them toward discovering the relationship between dividing by a fraction and multiplying by its reciprocal.

Through guided questioning, the teacher would facilitate critical thinking and help students arrive at the understanding that dividing $1/3$ by $1/3$ is equivalent to multiplying by the reciprocal, resulting in a value of 1.

References

Arends, R. I. (1998). *Resource handbook. Learning to teach* (4th ed.). Boston, MA: McGraw-Hill.

Brooks, J., & Brooks, M. (1993). In search of understanding: the case for constructivist classrooms, ASCD. *NDT Resource Center database*.

Copple, C., & Bredekamp, S. (2009). [*Developmentally appropriate practice in early childhood programs*](#). Washington, DC: National Association for the Education of Young Children.

Dewey, J. (1938) *Experience and Education*. New York: Collier Books.

Driscoll, M. (2000). *Psychology of Learning for Instruction*. Boston: Allyn & Bacon

Elliott, S.N., Kratochwill, T.R., Littlefield Cook, J. & Travers, J. (2000). *Educational psychology: Effective teaching, effective learning* (3rd ed.) . Boston, MA: McGraw-Hill College.

Ernest, P. (1994). Varieties of constructivism: Their metaphors, epistemologies and pedagogical implications. *Hiroshima Journal of Mathematics Education*, 2 (1994), 2.

Fox, R. (2001). [Constructivism examined](#). *Oxford review of education*, 27(1), 23-35.

Honebein, P. C. (1996). [Seven goals for the design of constructivist learning environments](#). *Constructivist learning environments: Case studies in instructional design*, 11-24.

Oliver, K. M. (2000). Methods for developing constructivism learning on the web. *Educational Technology*, 40 (6)

Phillips, D. C. (1995). [The good, the bad, and the ugly: The many faces of constructivism](#). *Educational researcher*, 24 (7), 5-12.

Tam, M. (2000). Constructivism, Instructional Design, and Technology: Implications for Transforming Distance Learning. *Educational Technology and Society*, 3 (2).

Teaching Guide for GSIs. Learning: Theory and Research (2016). Retrieved from <http://gsi.berkeley.edu/media/Learning.pdf>

von Glasersfeld, E. V. (1974). [Piaget and the radical constructivist epistemology](#). *Epistemology and education*, 1-24.

von Glasersfeld, E. (1994). A radical constructivist view of basic mathematical concepts. *Constructing mathematical knowledge: Epistemology and mathematics education*, 5-7.

1. To provide experience with the knowledge construction process (students determine how they will learn).
2. To provide experience in and appreciation for multiple perspectives (evaluation of alternative solutions).
3. To embed learning in realistic contexts (authentic tasks).
4. To encourage ownership and a voice in the learning process (student-centered learning).
5. To embed learning in social experience (collaboration).

6. To encourage the use of multiple modes of representation, (video, audio text, etc.)
7. To encourage awareness of the knowledge construction process (reflection, metacognition).