

# Constructivism

## About constructivism

Opposing to [behaviorism](#) and [cognitivism](#), [learning paradigms](#) which begin from a point of view that world external to the learner is objective and real and the learner needs to map it's principles and facts, constructivism as a learning paradigm<sup>1)</sup> suggests that:

- learning is not a passive, but an **active, socially enhanced** process of knowledge construction,
- knowledge cannot (and need not) be transferred to the learner, but rather **constructed by the learner**,
- the learner constructs his own subjective interpretation and **subjective meaning** of the objective reality by cognizing subject,
- learning occurs through interaction of learner's **prior knowledge** (knowledge schemes), ideas and experience,
- learning occurs in certain social, cultural and linguistic settings.

Teaching of a discipline should therefore:

- focus not teaching of the body of knowledge, but **experiencing** the processes and procedures, and
- use **language** as a tool that can help in **guiding** student's construction, but keep in mind that language users create subjective meaning based on their experience.

Although constructivist ideas can be tracked back to 18th century and authors like [Giambattista Vico](#)<sup>2)</sup> it mostly emerged in the 1970s<sup>3)</sup> and has been recognized as a paradigm, but also as a theory<sup>4)</sup>. Today constructivism usually appears in the literature in two main variants<sup>5)</sup>:

- **social constructivism** (also known as *personal constructivism* or *radical constructivism*) derived from works of [Lev Vygotsky](#) and extended in works of [Jean Lave](#), [Allan Collins](#) and [John Brown](#), which suggest knowledge is situation-specific and context-dependent and that social environment has a key role in learning, and
- **cognitive constructivism** (also known as *realist constructivism*) presented in works of authors like [Jean Piaget](#) or [Jerome Bruner](#), which, since knowledge cannot be directly transmitted from person to person, focuses on individual's knowledge construction and learning through discovery.

## Learning theories

- [Social Development Theory](#) - [Lev Vygotsky](#) (1896 - 1934)
- [Stage Theory of Cognitive Development](#) - [Jean Piaget](#) (1896 - 1980)
- [Situating Learning](#) - [Jean Lave](#)
- [Communities of Practice](#) - [Jean Lave](#) and [Etienne Wenger](#)

## Instructional design theories and learning models:

- [Cognitive Apprenticeship - Allan Collins](#)
- [Discovery Learning - Jerome Bruner \(1915 - \)](#)
  - [Case-Based Learning](#)
  - [Simulation-Based Learning](#)
  - [Goal Based Scenarios](#)
  - [Problem-Based Learning](#)
  - [Inquiry-Based Learning](#)
  - [Incidental Learning](#)

## Criticisms

Constructivist instructional design models have been subjected to much criticisms lately<sup>6)7)</sup>, mostly for promoting pure discovery-learning and minimally guided instruction. Richard Mayer<sup>8)</sup> has reviewed results of pure discovery-based learning experiments from 1950s to 1980s and concluded that every decade a new similar approach was invented under different name not making any significant difference. In his own words,

- *“Pure discovery did not work in the 1960s, it did not work in the 1970s, and it did not work in the 1980s... The debate about discovery has been replayed many times in education, but each time, the research evidence has favored a guided approach to learning.”*<sup>9)</sup>

Critics claim discovery-learning and minimally guided instruction, although more enjoyable to students<sup>10)</sup>,

- can lead to frustration due to **failure** or **misconceptions**<sup>11)12)</sup>,
- are **not as effective** as guided learning<sup>13)</sup>,
- cause **great cognitive load**<sup>14)15)</sup>,
- provide **worse results than worked examples**<sup>16)17)</sup>,
- result in greater **time consumption** without results improvement<sup>18)</sup>,
- do not show statistically significant improvements in knowledge when implemented in medical schools<sup>19)</sup>, and
- that these disadvantages will apply especially to novice learners<sup>20)</sup>.

Although constructivism also includes learning methods with a certain degree of guidance and not just discovery learning and minimally guided instruction, critics claim that those methods still ignore proven benefits guidance, worked examples<sup>21)</sup>, and induce a higher cognitive load resulting in lower resources available for learning due to orientation on finding a solution to a problem.

It is important to notice that these findings do **not indicate** that the initial **assumptions of constructivism** of a learner constructing his own representation of knowledge are **wrong**. The indicate that suggested instructional design consequences described in discovery learning models with minimal guidance do not necessarily follow. Today it is generally considered that advantages of guidance during instructional process begin to fade only when learners possess sufficient amount of prior knowledge to provide guidance by themselves<sup>22)</sup>.

## Bibliography

Ertmer, P. A., Newby T. J. Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 6(4):50-72. 1993.

Liu, C. H, and R. Matthews. Vygotsky's philosophy: Constructivism and its criticisms examined. *International Education Journal* 6, no. 3: 386-399. 2005.

Husen, T., and T. N. Postlethwaite. Constructivism in Education. In *The International Encyclopedia of Education*, 1:162-163. Oxford/New York: Pergamon Press, 1989.

Constructivism at Learning Theories. Retrieved March 2, 2011.

Sjoberg, S. Constructivism and learning. Invited contribution to Sjoberg, S., E. Baker, B. McGaw, and P. Peterson. *International Encyclopedia of Education 3rd Edition*, Oxford: Elsevier. 2007.

## Read more

Press, Teachers College. *Constructivism: Theory, Perspectives, and Practice*. Teachers College Press, 1996.

Steffe, L., & Gale, J. (Eds.). *Constructivism in education*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc. 1995.

Phillips, D. C. The good, the bad, and the ugly: The many faces of constructivism. *Educational researcher* 24, no. 7: 5-12. 1995.

Driver, R. Constructivist approaches in science teaching. In L. P. Steffe & J. Gale (Eds.), *Constructivism in education* (pp. 385-400). Hillsdale, NJ: Lawrence Erlbaum Associates. 1995.

Duit, R. The constructivist view: A Fashionable and fruitful paradigm for science education research and practice. In L. P. Steffe & J. Gale (Eds.), *Constructivism in education* (pp. 271-285). Hillsdale, NJ: Lawrence Erlbaum Associates. 1995.

Tobin, K., & Tippins. D. Constructivism as a referent for teaching and learning. In K. Tobin (Ed.), *The practice of constructivism in science education* (pp. 3-21). Hillsdale, NJ: Lawrence Erlbaum Associates. 1993.

1)

Constructivism is a term often used in different fields with many different meanings.

2)

Giambattista, V. *De Antiquissima Italorum Sapientia*. 1710.

3) 5)

Liu, C. H, and R. Matthews. Vygotsky's philosophy: Constructivism and its criticisms examined. *International Education Journal* 6, no. 3: 386-399. 2005.

4)

Press, Teachers College. *Constructivism: Theory, Perspectives, and Practice*. Teachers College Press, 1996.

6) 8)

Mayer, R. Should there be a three-strikes rule against pure discovery learning? The case for guided

methods of instruction. *American Psychologist*, 59, 14-19. 2004.

7) 22)

Kirschner, P. A, Sweller, J. and Clark, R. E. Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational psychologist* 41, no. 2: 75-86. 2006.

9)

Mayer, R. Should there be a three-strikes rule against pure discovery learning? The case for guided methods of instruction. *American Psychologist*, 59, p18. 2004.

10) 18)

Albanese, M., & Mitchell, S. Problem-based learning: A review of the literature on its outcomes and implementation issues. *Academic Medicine*, 68, 52-81. 1993.

11)

Hardiman, P., Pollatsek, A., & Weil, A. Learning to understand the balance beam. *Cognition and Instruction*, 3, 1-30. 1986.

12)

Brown, A., & Campione, J. . Guided discovery in a community of learners. In K. McGilly (Ed.), *Classroom lessons: Integrating cognitive theory and classroom practice* (pp. 229-270). Cambridge, MA: MIT Press. 1994.

13)

Moreno, R. Decreasing cognitive load in novice students: Effects of explanatory versus corrective feedback in discovery-based multimedia. *Instructional Science*, 32, 99-113. 2004.

14)

Tuovinen, J. E., & Sweller, J. A comparison of cognitive load associated with discovery learning and worked examples. *Journal of Educational Psychology*, 91, 334-341. 1999.

15)

Sweller, J. Cognitive load during problem solving: Effects on learning. *Cognitive Science*, 12, 257-285. 1988.

16)

Cooper, G., & Sweller, J. The effects of schema acquisition and rule automation on mathematical problem-solving transfer. *Journal of Educational Psychology*, 79, 347-362. 1987.

17)

Sweller, J., & Cooper, G. A. The use of worked examples as a substitute for problem solving in learning algebra. *Cognition and Instruction*, 2, 59-89. 1985.

19)

Colliver, J. A. Effectiveness of problem-based learning curricula: Research and theory. *Academic Medicine*, 75, 259-266. 2000.

20)

Roblyer, M. D., Edwards, J., & Havriluk, M. A. *Integrating educational technology into teaching* (2nd ed.). Upper Saddle River, NJ: Prentice-Hall. 1997.

21)

From: <https://www.learning-theories.org/> - **Learning Theories**

Permanent link: [https://www.learning-theories.org/doku.php?id=learning\\_paradigms:constructivism&rev=1309427214](https://www.learning-theories.org/doku.php?id=learning_paradigms:constructivism&rev=1309427214)

Last update: **2023/06/19 15:49**

