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**learning theories  
in plain english  
VOL. 1**

# Learning Theories

Summaries of learning theories and models for educational psychology, cognitive science, human- computer interaction, instructional design, and other related fields.

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## 21st Century Skills (P21 and others)

<http://www.learning-theories.com/21st-century-skills-p21-and-others.html>

Summary: Skills necessary for students to master in order for them to experience school and life success in an increasingly digital and connected age; includes digital literacy, traditional literacy, content knowledge, media literacy, and learning/innovation skills.

Originators & Proponents: Groups – United States Department of Education, Partnership for 21st Century Skills, MacArthur Foundation; Individuals – Henry Jenkins, Mimi Ito, John Seely Brown

Keywords: collaboration, digital literacy, innovation, technology, work-life skills, readiness, interdisciplinary learning, problem-solving, ICT (information and communication technologies)

### 21st Century Skills (Partnership for 21<sup>st</sup> Century Skills and other groups and individuals)

The 21st Century Skills initiative is an education standards and reform movement, located primarily in the United States, that is focused on improving what US public school students must learn in school so that they are better prepared to succeed in their school and career lives. The term “21<sup>st</sup> century skills” includes the following skill sets:

- Life/career skills: adaptability & flexibility, initiative & self-direction, leadership & responsibility, productivity & accountability, social & cross-cultural skills
- Core subjects: English/language arts, mathematics, arts, science, history, geography and others
- 21<sup>st</sup> century themes: civic literacy, environmental literacy, financial literacy (including economic, business, and entrepreneurial skills), global awareness, health literacy
- Information/media/technology skills: media literacy, information literacy
- Learning/innovation skills: creativity, critical thinking, collaboration, communication, problem solving

Students are expected to master these skills and understand these themes while learning core subject content in meaningful, interdisciplinary way. Teachers, administrators, schools, and districts are expected to use these guidelines, known as the P21 Framework, as a foundation for developing curriculum, assessments, and standards that they deem appropriate for their students.

Some organizations, like the Partnership for 21<sup>st</sup> Century Skills, provide tools and resources for educators to use in supporting their students’ acquisition of these skills. In addition, there are also model classrooms, schools, and districts that can serve to guide others as they develop their alignment with these standards. Teachers are encouraged to create their own curriculum following the P21 Framework that would work best for their students.

<https://www.youtube.com/watch?v=c0xa98c7-F4w>

**For more information, see:**

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- ♦ Partnership for 21<sup>st</sup> Century Skills -- [The P21 Framework](#)
  - ♦ Jenkins, H. (2009). [Confronting the Challenges of Participatory Culture: Media Education for the 21st Century \(The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning\)](#). Cambridge, MA: MIT Press.
  
  - ♦ [“How do you define 21<sup>st</sup>-century learning? One question. Eleven answers.”](#) *Education Weekly Teacher PD Sourcebook*, October 11, 2010
  - ♦ [“Museums, Libraries, and 21<sup>st</sup>-century skills”](#) -- Institute of Museum and Library Services
  - ♦ [“21<sup>st</sup> Century Skills”](#) -- Glossary of Education Reform
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## Activity Theory

<http://www.learning-theories.com/activity-theory.html>

Summary: Activity Theory is a framework or descriptive tool for a system. People are socio-culturally embedded actors (not processors or system components). There exists a hierarchical analysis of motivated human action (levels of activity analysis).

Originator: Vygotsky, Leont'ev, Luria, and others starting in the 1920s.

Key terms: Activity, action, operation, object-orientedness, internalization/externalization, mediation, development.

### Activity Theory

Activity Theory is more of a descriptive meta-theory or framework than a predictive theory. Considers entire work/activity system (including teams, organizations, etc.) beyond just one actor or user. Accounts for environment, history of the person, culture, role of the artifact, motivations, complexity of real life action, etc.

The unit of analysis is *motivated activity directed at an object* (goal). Includes cultural and technical mediation of human activity, artifacts in use (and not in isolation). Activities consist of goal-directed actions that are conscious. Constituents of activity are not fixed; they can dynamically change.

Engestrom's model above is useful for understanding how a wide range factors work together to impact an activity. In order to reach an *outcome* it is necessary to produce certain *objects* (e.g. experiences, knowledge, and physical products) Human activity is mediated by artefacts (e.g. tools used, documents, recipes, etc.) Activity is also mediated by an organization or community. Also, the community may impose rules that affect activity. The subject works as part of the community to achieve the object. An activity normally also features a division of labour.

Three levels of activity:

- ♦ Activity towards an objective (goal) carried out by a community. A result of a motive (need) that may not be conscious social and personal meaning of activity. (Answers the Why? question)
- ♦ Action towards a specific goal (conscious), carried out by an individual or a group possible goals and subgoals, critical goals (Answers the What? question)
- ♦ Operation structure of activity typically automated and not conscious concrete way of executing an action in according with the specific conditions surrounding the goal (Answers the How? question)

Principles:

1. Object-orientedness. (this is not to be confused with object-oriented programming) People live in a reality that is objective in a broad sense: the things that constitute this reality have not only the

properties that are considered objective according to natural sciences but socially/culturally defined properties as well.

2. Internalization/externalization. Distinction between internal and external activities. Internal activities cannot be understood if they are analyzed separately from external activities, because they transform into each other. Internalization is the transformation of external activities into internal ones. Internalization provides a means for people to try potential interactions with reality without performing actual manipulation with real objects (mental simulations, imaginings, considering alternative plans, etc.). Externalization transforms internal activities into external ones. Externalization is often necessary when an internalized action needs to be "repaired," or scaled. It is also important when a collaboration between several people requires their activities to be performed externally in order to be coordinated.
3. Mediation. Activity Theory emphasizes that human activity is mediated by tools in a broad sense. Tools are created and transformed during the development of the activity itself and carry with them a particular culture - historical remains from their development. So, the use of tools is an accumulation and transmission of social knowledge. Tool use influences the nature of external behavior and also the mental functioning of individuals.
4. Development. In Activity Theory development is not only an object of study, it is also a general research methodology. The basic research method in Activity Theory is not traditional laboratory experiments but the formative experiment which combines active participation with monitoring of the developmental changes of the study participants. Ethnographic methods that track the history and development of a practice have also become important in recent work.

All four of the above basic principles should be considered as an integrated system, because they are associated with various aspects of the whole activity.

For more information, see:

- ♦ Yrjö Engeström's book: [Perspectives on Activity Theory \(Learning in Doing: Social, Cognitive and Computational Perspectives\)](#)
- ♦ [Acting with Technology: Activity Theory and Interaction Design](#)

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## Actor-Network Theory (ANT)

<http://www.learning-theories.com/actor-network-theory-ant.html>

Summary: Actor-Network Theory is a framework and systematic way to consider the infrastructure surrounding technological achievements. Assigns agency to both human and non-human actors (e.g. artifacts)

Originator: Michel Callon (1991) and Bruno Latour (1992); John Law; others.

Key Terms: actor, network, generalized symmetry, equal agency

### Actor-Network Theory (ANT)

Originally created by French scholars Latour and Callon as an attempt to understand processes of technological innovation and scientific knowledge-creation, Actor-Network Theory (ANT) can be contrasted with "heroic" accounts of scientific advance. For example, rather than saying Newton "founded" the theory of gravitation seemingly as though he were alone in a vacuum, Actor-Network Theory emphasizes and considers all surrounding factors -- no one acts alone. Galileo's past experiences, his colleagues, his connections with the Astronomer Royal, John Flamsteed, his use of Euclidean geometry, Kepler's astronomy, Galileo's mechanics, his tools, the details of his lab, cultural factors and restrictions placed upon him in his environment, and various other technical and non-technical elements would all be described and considered in his actor-network.

Actor-Network Theory does not typically attempt to explain why a network exists; it is more interested in the infrastructure of actor-networks, how they are formed, how they can fall apart, etc.

Actor-Network Theory incorporates what is known as a *principle of generalized symmetry*; that is, what is human and non-human (e.g. artifacts, organization structures) should be integrated into the same conceptual framework and assigned equal amounts of agency. In this way, one gains a detailed description of the concrete mechanisms at work that hold the network together, while allowing an impartial treatment of the actors.

#### Criticism

There are various criticisms held regarding ANT. These include: (1) the absurdity of assigning agency to nonhuman actors; (2) that ANT is amoral; (3) that because it assumes all actors are equal within the network, no accommodations for power imbalances can be made; and (4) that ANT leads to useless descriptions that seem pointless.

For more information, see:

- ♦ Callon, M. (1986). Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieux Bay. In John Law (ed.), *Power, Action and Belief: A New Sociology of Knowledge*. London: Routledge & Kegan Paul.

- ♦ Latour, B. (1987). *Science in Action: How to Follow Scientists and Engineers Through Society* (Milton Keynes: Open University Press).
  - ♦ Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press).
  - ♦ Law, J. (1987). *Technology and Heterogeneous Engineering: The Case of Portuguese Expansion*. In W.E. Bijker, T.P. Hughes, and T.J. Pinch (eds.), *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press.
  - ♦ [Actor-Network Theory](#) entry on Wikipedia
  - ♦ Bruno Latour discusses [common misunderstandings](#) related to Actor-Network Theory
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## **ADDIE Model**

<http://www.learning-theories.com/addie-model.html>

Summary: The ADDIE model is a systematic instructional design model consisting of five phases: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation. Various flavors and versions of the ADDIE model exist.

Originator: Unknown. Refined by Dick and Carey and others.

Key terms: Analysis, Design, Development, Implementation, Evaluation

### **ADDIE Model**

The generic term for the five-phase instructional design model consisting of Analysis, Design, Development, Implementation, and Evaluation. Each step has an outcome that feeds into the next step in the sequence. There are probably over 100+ different variations of the generic ADDIE model.

The five phases of ADDIE are as follows:

#### *Analysis*

- During analysis, the designer identifies the learning problem, the goals and objectives, the audience's needs, existing knowledge, and any other relevant characteristics. Analysis also considers the learning environment, any constraints, the delivery options, and the timeline for the project.

#### *Design*

- A systematic process of specifying learning objectives. Detailed storyboards and prototypes are often made, and the look and feel, graphic design, user-interface and content is determined here.

#### *Development*

- The actual creation (production) of the content and learning materials based on the Design phase.

#### *Implementation*

- During implementation, the plan is put into action and a procedure for training the learner and teacher is developed. Materials are delivered and distributed to the student group. After delivery, the effectiveness of the training materials is evaluated.

#### *Evaluation*

- This phase consists of (1) formative and (2) summative evaluation. Formative evaluation is