

Learning Cycles

Learning in loops, not lines!



FIRST and Learning

Mission

- ▶ The mission of *FIRST* is to inspire young people to be science and technology leaders, by engaging them in exciting Mentor-based programs that build science, engineering, and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.

Vision

- ▶ *"To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology leaders."* Dean Kamen, Founder

Methodology

- ▶ Engage kids in kindergarten through high school in exciting, Mentor-based, research and robotics programs that help them become science and technology leaders, as well as well-rounded contributors to society.



What is Learning?

- ▶ knowledge or skill acquired by instruction or study
- ▶ modification of a behavioral tendency by experience (as exposure to conditioning)

Types of Learning:

Formal learning: learning typically provided by an education or training institution, structured (in terms of learning objectives, learning time or learning support) and leading to certification. Formal learning is intentional from the learner's perspective. (Cedefop 2001)

Informal learning: learning resulting from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases it is not-intentional (or "incidental"/random). (Cedefop 2001)



How human beings learn

What Is Learning?

Learning is acquiring new or modifying existing knowledge, behavior, skills, values or preferences. In short, learning happens every single day and will do so until the day you die! Generally speaking, there are two main types of learning; associative and non-associative. When you learn something without a risk or reward attached to it, it is non-associative, and vice-versa is associative.





Habituation: When a creature becomes “use to” an external stimuli, such as a snail who becomes accustomed to taps on its shell and no longer reacts to them by retreating inside its shell.

Non-Associative Learning

There are two types of non-associative learning. They are Habituation and Sensitization.



Sensitization: When, due to a event or action, a creature becomes overly sensitive to a related action or event. Here, the example is an underwater worm, who is fed from a particular direction in a tube. The worm will become more respondant to any novel change at the end of the tube, because of its association with food.

Associative Learning

The other word for associative learning (or learning that is attached to a risk or reward) is conditioning. This is the process of attaching an arbitrary stimulus to an event in order to produce an association. The work of Ivan Pavlov was instrumental in the exploration of this concept.



Pavlov experimented with dogs, and conditioned them to salivate at the sound of a bell, after associating the sound of the bell with their feeding schedules.



The important thing to remember here is that non-associative and associative learning occurs without conscious awareness. Conscious learning is where human beings thrive in later life and it usually takes place within the confines of Formal Learning.

<http://edtechtimes.com/2013/01/10/how-humans-learn-infographic/>



Learning Styles

VERBAL

Words are your strongpoint!
You prefer to use words both
in speech and in writing!

VISUAL

You prefer to use pictures,
diagrams, images and spatial
understanding to help you
learn

MUSICAL / AUDITORY

You prefer using sounds or
music or even rhythms to
help you learn.

PHYSICAL / KINAESTHETIC

You use your hands, body
and sense of touch to help
you learn. You might 'act
things out'.

WHAT'S YOUR LEARNING STYLE?

LOGICAL / MATHEMATICAL

Learning is easier for you if
you use logic, reasoning,
systems and sequences.

SOCIAL

You like to learn new things
as a part of a group.
Explaining your
understanding to a group
helps you to learn.

SOLITARY

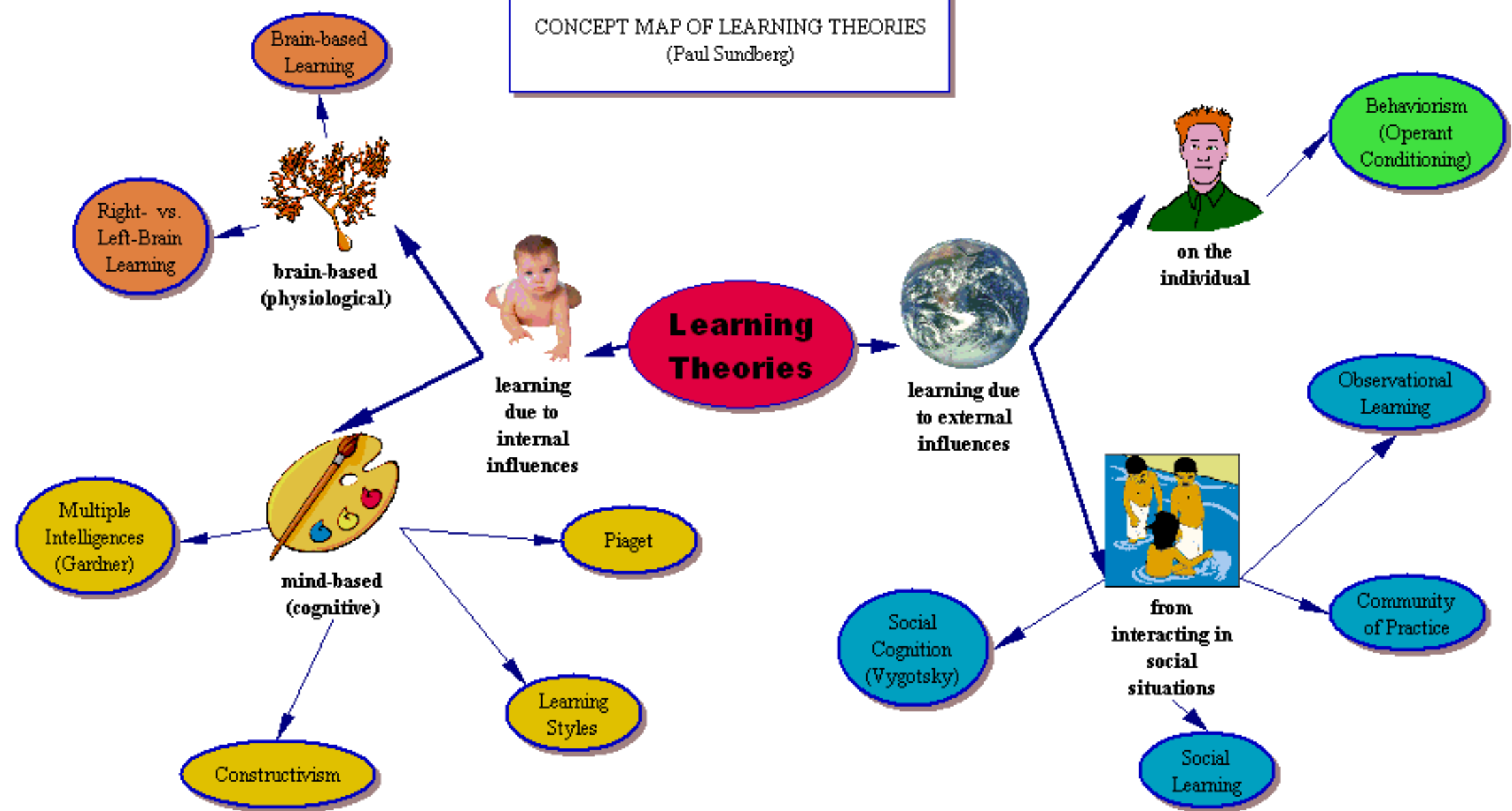
You like to work alone. You
use self-study and prefer your
own company when
learning.

COMBINATION

Your learning style is a
combination of two or more
of these styles.



CONCEPT MAP OF LEARNING THEORIES
(Paul Sundberg)

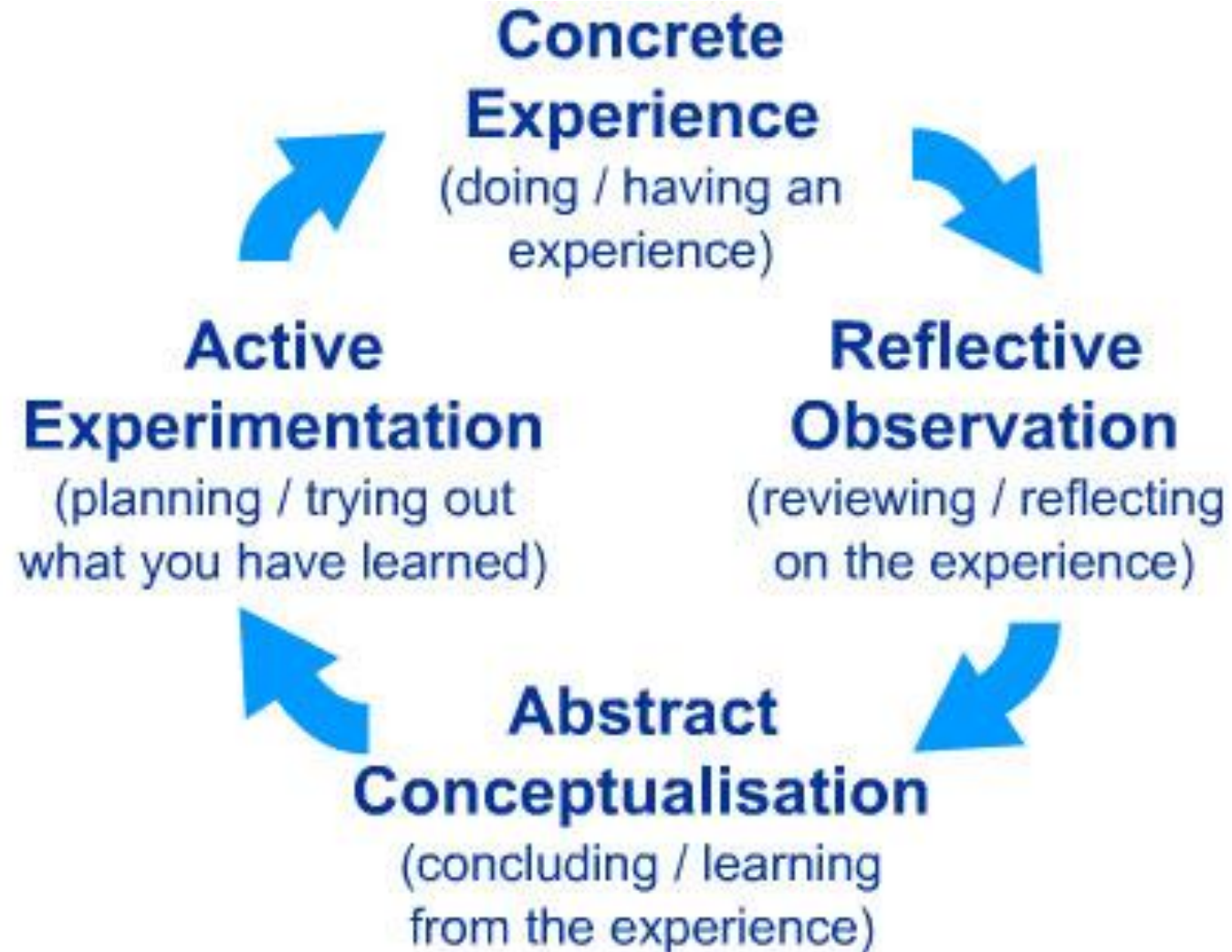


How do you “engage” learning in FIRST?

- ▶ Lecture
- ▶ Observation
- ▶ Practice
- ▶ Demonstrations
- ▶ ??????



Kolb's Experiential Learning Cycle



Want to learn more?

- ▶ Experiential Learning Cycles - David Kolb
- ▶ Learning How to Learn - MOOC
 - ▶ *A Mind for Numbers* - Barbara Oakley



Thank you!

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