

My Personal Definition of Learning (based on ideas from many learning theorists)
Jack Koumi, March 2007

An example of “rote learning” is verbatim memorization of my 16-digit MasterCard number, without making any conscious connection between the number and any existing knowledge, apart from its arbitrary attachment to the concept of “my MasterCard”.

In contrast, my main definition, following, involves new information that is *meaningfully* related to existing knowledge, not merely as an arbitrary attachment.

The definition is a five-stage elaboration of the dictionary definition: “Learning is the acquisition of knowledge or skill.”

1. First, I would characterize “acquisition” in terms of Cognitive Information Processing theory; that is, as “storage” in Long-Term Memory (LTM) through the conscious interrogation by Working Memory of incoming information, perceived via Sensory Memory (very short term perceptual store). The interrogation has two aspects:
 - a) attending (fully or otherwise) to the information in the perceptual store
 - b) encoding the perceived information by relating it to existing knowledge in LTM
2. The term “acquisition” suggests all-or-none, whereas any teacher can attest that the knowledge/skill can be incomplete (lacking detail), shallow (lacking depth) and fragile (lacking endurance). This would depend on several factors:
 - a) how fully the learner attended to the incoming information
 - b) the number of associations with existing knowledge/skill plus the quality of these associations (how good is the fit with the learner’s existing knowledge)
 - c) the opportunity to view the knowledge from several perspectives; this enables learners to construct deeper, more comprehensive knowledge – as a synthesis of multiple interpretations
 - d) applying the knowledge (making practical use of it) would refine and strengthen it, because this entails diligent reflection and rehearsal
 - e) presenting/articulating the knowledge/skill to an audience has the effect of pinning it down more securely, because preparing a presentation necessitates reflection and is targeted at clear evidence of knowing.
3. I want to distinguish five types of interaction between incoming knowledge and existing knowledge, using the notion of *schema* – a data structure representing the generic concepts and procedures stored in memory and containing placeholders that can be instantiated with particular incoming information.

- a) Assimilating facts = remembering information that has been instantiated within an existing schema.
- b) Modifying a schema to be more consistent with experience (accommodating new information).
- c) Creating a new schema that is analogous to an old one.
- d) Creating a new schema, not by analogy, but rather as an innovative construction that serves to accommodate some novel items of information.
- e) Creating a new schema that subsumes two or more old ones.

4. Concerning the *type of knowledge* that is learned and the *cognitive processes* that the learner can now apply to each type, a useful tabulation is the Anderson and Krathwohl (2001) revision of Bloom's taxonomy of learning outcomes, as summarized in Krathwohl, D.R. (2002) *A Revision of Bloom's Taxonomy: An Overview*, in THEORY INTO PRACTICE 41 4, College of Education, The Ohio State University. Retrieved Feb, 2013
http://www.unco.edu/cetl/sir/stating_outcome/documents/Krathwohl.pdf :

		Knowledge dimensions			
		Facts	Concepts	Procedures	Metacognition
Cognitive processes	Remember				
	Understand				
	Apply				
	Analyze				
	Evaluate				
	Create				

This taxonomy serves to refine my earlier description (in items 2 and 3) of *acquisition of knowledge*. On the other hand the taxonomy itself could also be refined by the observation in item 2 that knowledge acquisition can be *incomplete, shallow and fragile*. Hence the two-dimensional taxonomy could be usefully enhanced by appending three further dimensions: *completeness, depth and endurance*.

5) A final progression of the definition embraces constructivism, which asserts (roughly speaking) that knowledge is not passively received but actively built up by the learner, who selects information and organizes it in a way that is individually meaningful on the basis of the learner's existing knowledge. This results in a knowledge structure/schema that is idiosyncratic in its details, not necessarily corresponding to an external reality. However, most constructivist theorists accept that the schema captures the essence of common knowledge, if only because many embrace Vygotsky's notion that meaning is not solely an individual construction but rather socially negotiated.

Such a knowledge construction process can form the basis of higher order learning (e.g. apply, analyze, evaluate, create), when combined with activities 2d (applying acquired knowledge) and 2e (presenting/articulating the knowledge).

Some constructivist implications

The constructivist conception is generally taken to imply that a teacher should not attempt merely to impart information to a group of learners and expect understanding and knowledge assimilation. Instead the teacher needs to construct a flexible, multi-perspective learning environment in which to be a “guide on the side” rather than the “sage on the stage.” As well, the teacher would need to be aware of each learner’s knowledge and learning strategies and then assist each learner to restructure their knowledge (for example by asking clarifying and provocative questions).

The *social* constructivist conception would additionally imply that the learning environment should include a social dimension, involving discourse between teacher and student and also between students.

Some CAVEATS

The above implications suggest that little or no knowledge can be gained from the learner experiencing an *exposition* of learning material, such as listening to a inspirational lecture or watching a well designed instructional video or hearing bed-time-stories from your grandfather. This is clearly false: most if not all of us have learned much of what we know from such experiences.

I do believe that learners *actively construct* their knowledge based on internal and external environments, **as evidenced by item 3 above, which essentially suggests some mechanisms for such construction.** However, there is nothing to prevent active construction of knowledge from well-designed, engaging *exposition*, that is, *transmission* of learning materials.

Thereafter, that knowledge construction can be refined and strengthened by putting it into practice (item 2d) and can be pinned down by preparing a presentation then articulating the knowledge to an audience (item 2e).

As to social interaction and negotiation of meaning, again, it can play a part in clarifying and fixing knowledge constructs, but it is not universally a *sine qua non* for robust knowledge construction.

Admittedly, for all learners (and for some more than others), a teacher who carefully designs individual scaffolding and dialogue will help a learner achieve more than would be possible without such interaction. As well (for some learners more than others) interaction with (multi-perspective) peers can help retrieve, reinforce and clarify faintly understood knowledge.

BUT the dialogic teaching and the social negotiation of meaning needs to be **preceded** by pedagogically designed **exposition**, be it an article that is read, or a lecture that is attended or an instructional audiovisual package that is viewed (then followed by reflection and articulation).