

My notes in red. Look at the highlights!

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Long-Term Memory: A User's Guide

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When you're designing learning experiences, long-term memory is your ultimate destination. It's the promised land—where you want newly learned content and skills to find their place. So shouldn't we be more familiar with the characteristics and dynamics of long-term memory? I think we need a user's guide.

The Basics

1. Long-term memory (LTM) is a hypothetical construct. Although you won't find a matching structure in the brain, it's a helpful mental model to think of long-term memory as a dynamic yet permanent store of information.
2. Rather than being a distinct structure, researchers have found regions in every lobe of the brain that store and retrieve memories of facts and events.
3. We are usually referring to long-term memory when we talk about remembering something. **(an important content, through website navigation, for example)**
4. Long-term memory encompasses three operations: encoding, storage and retrieval. These are all examined below.
5. Long-term memory is more than a knowledge archive. It provides the background information that we need to understand the world by bringing relevant knowledge into working memory as it's needed.

Types of Long-term Memory

1. Cognitive psychologists think of long-term memory as divided into two broad types. **Explicit memory**, also called declarative memory, consists of memories we are aware of or conscious memories. **Implicit memory**, also called nondeclarative memory, is unconscious. It consists of memories used without our conscious awareness.
2. Explicit memory (the conscious kind) consists of *semantic memory*—memory for facts and knowledge about the world—and *episodic memory*—memory for personal experiences.

3. There are several types of implicit memories (the unconscious kind). Most relevant to training is *procedural memory*. This is our memory for doing things that usually require action. When use a mouse on the computer or dial a phone number we are not consciously aware of the memories that enable us to perform these skills.

Capacity, Duration and Speed

1. It is unknown how long information in long-term memory can last. It could be stored indefinitely. Think of the older people you know who are experts in their field or who remember details of their childhood. Some information appears to last forever.
2. It is equally unknown how much information long-term memory can store. In practical terms, think of long-term memory as having an infinite capacity because it never gets used up.
3. The time it takes to access information in long-term memory is thought to be 200 milliseconds or .200 second.

Encoding

1. When information is transformed and "written" to long-term memory it is known as *encoding*. There are varied strategies that instructional designers and learners can use to improve encoding. See the Strategies below.
2. Information in long-term memory is most likely stored in network-type structures called schemas. Schemas are an efficient way to organize interrelated concepts in a meaningful way. **Our personal and internal information architecture project.**
3. When we learn or experience something new and connect it with previously stored information, the process is known as assimilation.
 4. Sometimes we learn something new or have experiences that don't fit in with existing schemas. We then alter existing schemas or create new ones in a process is known as accommodation. **This is the main subject or issue for information architecture and we call it as "user experience" that means: learn and understand anything by having an experience of navigation through the internet or through a digital environment.**

Retrieval

1. Retrieval is the process of activating and using information from long-term memory. Retrieval is facilitated through retrieval cues, which is any stimulus that helps us recall information from long-term memory.
2. **Some cognitive psychologists think that not being able to remember something is more a failure of not having the right cue than the fact that the information is not present in long-term memory.**
3. Recognition memory is almost always better than recall. Recognition involves determining whether you've seen something before. With recall, you have to generate the remembered information.
4. Memories are more than a simple construction of recalled information. Rather, what we recall is influenced by attitudes, beliefs and previous experiences. **So memories are *reconstructed* events.**

Strategies to Enhance Encoding and Retrieval

1. The transfer of information into long-term memory is facilitated by elaboration or elaborative rehearsal. Some elaboration strategies include: **thinking of related ideas** or examples of the content, mentally tying the information together or creating a mental image of the information. Course designers and instructors can encourage this behavior.
2. Most likely, retrieval is improved when the type of elaboration used for encoding matches the type of task required for retrieval.
3. Making purposeful connections and associations with prior knowledge improves transfer to long-term memory. Many designers and instructors use this strategy and it is one of Gagne's Nine Events of Instruction.
4. **Organizing information, such as categorizing it into subsets,** can facilitate retrieval. Many people do this spontaneously and instructional designers spend a great deal of effort at organizing information into meaningful **chunks**. **Categorizing and classifying content as an important task of information architecture.**
5. Retention is improved through distributed practice across multiple study sessions rather than concentrating the same amount of practice into one session. This allows information to be consolidated into memory over time.
6. **People can recall facts better when the facts are associated with a personal experience. Pairing semantic memories with episodic memories facilitates learning.**