Cheatography

Memory: Information Processing Model Cheat Sheet

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Introduction

In cognitive psychology, memory is normally divided into three functions for storage (Anderson, 2000):.

■ **Sensory Memory:** The sensory memory retains an exact copy of what is seen or heard (visual and auditory). It only lasts for a few seconds, while some theorize it last only 300 milliseconds. It has unlimited capacity.

■ **Short-Term Memory (STM)** - Selective attention determines what information moves from sensory memory to short-term memory. STM is most often stored as sounds, especially in recalling words, but may be stored as images. It works the same as a computer's RAM (Random Access Memory) in that it provides a working space for short computations and then transfers it to other parts of the memory system. It isnormally about seven bits in length (we normally remember seven items at once). STM is vulnerable to interruption or interference.. ■ **Long-Term Memory (LTM)** - This is relatively permanent storage. Information is stored on the basis of meaning and importance.

credit: http://www.nwlink.com/~donclark/hrd/learning/memory.html

Short-Term Memory (STM)

■ **A limited capacity of up to 7 pieces of independent information.**

■ **The brief duration of these items last from 3 to 20 seconds.**

■ **Decay appears to be the primary mechanism of memory loss.**

After entering sensory memory, a limited amount of information is transferred into short-term memory. Within STM, there are three basic operations:

■ **Iconic memory** - The ability to hold visual images.

■ **Acoustic memory** - The ability to hold sounds. Acoustic memory can be held longer than iconic memory.

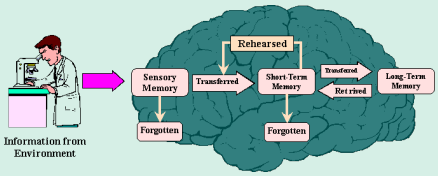
■ **Working memory** - An active process to keep it until it is put to use (think of a phone number you repeat to yourself until you can dial it).

Transferring information from STM to LTM involves the encoding or consolidation of information. The longer a memory stays in STM, the more likely it is to be placed into LTM; but organizing complex information in STM before it is encoded into LTM, the meaningfulness or emotional content of an item may play a greater role in its retention into LTM. Instructional designers must make learning relevant and meaningful for the learner to transfer of information to their long-term memory.

Chunking - Moving Groups of Items to LTM

Chunking allows the brain to group items together, improving ability to remember and learn. The use of "chunking" is a significant aid for enhancing the STM transfer to LTM. STM's capacity is limited to about 7 items, regardless of complexity.

Information Processing Model



The progress of information through these storage systems is often referred to as the Information Processing Model (Marzano, 1998)

Long-Term Memory (LTM)

The knowledge stored in our LTM affects our perceptions of the world, and influences what information in the environment we act on. LTM provides the framework to attach new knowledge. It contrasts with short-term and perceptual memory in that information can be stored for extended periods of time.

Schemas are mental models of the world. Information in LTM is stored in interrelated networks of these schemas. These, in turn, form intricate knowledge structures. Related schemas are linked together, and information that activates one schema also activates others that are closely linked. This is how we recall relevant knowledge when similar information is presented. These schemas guide us by focusing our attention to relevant information and allow us to disregard what is unimportant.

Since **LTM storage is organized into schemas**, instructional designers should activate existing schemas before presenting new information. This can be done in a variety of ways, including graphic organizers, curiosity-arousing questions, movies, etc.

LTM has a strong influence on perception through top-down processing - our prior knowledge affects how we perceive sensory information. Our expectations regarding a particular sensory experience influence how we interpret it. This is how we develop bias. Most optical illusions take advantage of this fact.

An important factor for retention of learned information in LTM is rehearsal.

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