Three Types of Memory

The Marvel of Memory

Learning and memory are closely related and the terms are often interrelated. Learning refers to the acquisition and encoding of information while memory relates to the storage and retrieval of that information.

The ability to accurately recall information is often envied by others. One story tells of how the ancient Greeks revered people with powerful memories to the point that worked very hard to devise techniques for enhancing memory. They created a series of mnemonics (pronounced neh-mon-icks) or memory tools to assist in recalling information. Some of these tools are still used today. Still, all the tools in the world will not help participants to retain information if you fail to remember that for most adults, information received must be:

- **Meaningful** and something they perceive as valuable or useful. When presenting such information it is helpful to put it into a format or structure that aids in retention and allows participants to connect it to previously received information. The use of analogies and metaphors can assist in this effort, as can short interim reviews done periodically.

- **Given individually** or one item at a time with no other distractions being offered at the time. For example, if you are presenting a key point for discussion on a flip chart or dry erase board, turn off your PowerPoint or overhead projector images.

- **Presented effectively** and in a manner that allows time for participants to focus on and grasp the concepts. They should have ample time to process what was received and then be able to take notes or ask questions as they feel necessary. Slowing your rate of speech and reducing the numbers of points presented in a session can assist in accomplishing this.

- **Reviewed** and tied to previously learned concepts every 15-20 minutes in order to cement them into memory and enhance understanding of the overall scheme of the concept or material.

Like other brain-based research, the study of memory has led to some significant advances into understanding how the human mind works. Primarily, scientists have discovered that memory is not a single function structure, nor does it occur in only one area of the brain. Instead, memory is a dynamic process that reconstructs various pieces of information stored in different areas of the brain each time someone encounters new items, then attempts to make sense of the material.

One key finding, that you can immediately apply in your training programs, is that pictures are more impactful to memory than mere words. This superiority of images over written or spoken words is true even when pictures and words are combined[1].

There are a couple of important implications of memory research. First, participants will often recall words or information that is implied rather than actually presented. For example, in referring to a brain-based learning environment if you were to give a series of terms such as, fun, excitement, music, color, table glitter, toys, and props then later ask someone to describe the environment of a brain-based learning program, they might likely include the term "party atmosphere." This is because the brain is an active unit that continually stores and recalls information and material. It may well associate the items you listed with a festive or party scenario. New external input is often intermingled with existing memories that are similar. The result is often incorrect memory recall. This phenomenon often occurs at crime or accident scenes, which is why law enforcement officers interview all available witnesses in order to identify common story elements. This collective memory can help them get a more realistic picture of what actually happened.

Due to the mental distortion that can occur in a training session, it is important that you deliver material to as many senses (e.g. seeing, hearing, tasting, touching, and smelling) as possible. Additionally, you should periodically clarify and verify understanding, then review material every 15-20 minutes to help solidify concepts in the mind of your participants.

The second implication of memory research is that participants benefit more when related events or items are grouped or placed in logical sequence. For example, step 1 ,2 3 versus, step 3, 1, 2. This is important because when unsequenced information is delivered, the brain pauses and attempts to categorize or associate what is received in order to facilitate recall. When you present an item or make a point that relates to something presented much earlier in the program and is not associated with your current sequence of material, you can actually cause learning to stop. This is because distracted participants will attempt to internally sequence and compare items in their mind in order to make sense of them.

Three Types of Memory

There are three types of memory that come into play for learners:

Sensory memory, sometimes referred to as sensory register, is the first aspect of memorization. All incoming stimuli comes through the five senses and is held there long enough (milliseconds) to recognize and either pass it along to working memory or discard it.

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[1] Committee on Learning Research and Educational Practice, *How People Learn: Brain, Mind, Experience, & School*, National Academy Press, Washington, DC., 2000, p124.

Short-term memory or working memory refers to the ability to retain limited amounts of information for brief period of time (some researchers say from 5-30 seconds). To retain information in short-term memory indefinitely requires repeating the information. Think of times when you were trying to remember a telephone number you looked up in the telephone directory. As long as you continued to repeat the number to yourself enroute to dial the number on the telephone, you likely accurately recalled it. However, if someone or something momentarily distracted you by interrupting you repetition of the number, you probably forgot and had to look the number up again. Similarly, if you provide information to attendees that you want them to act on without giving them uninterrupted opportunity to focus on the information, they will likely be unsuccessful.

In 1956, American psychologist George Miller reviewed many experiments on memory span and determined that the average person can recall seven bits or chunks of information, plus or minus two from short-term memory. The plus or minus came from the fact that studies were inconsistent in their findings. Subsequent studies have found that working memory capability increases as children age, it decreases as people grow older. The latter is especially true in cases of brain disease, such as Alzheimer's disease.

We see examples of this chunking theory used daily in ours lives. Examples of the use of seven, plus or minus items include:

- U.S. Postal Zip Code = 00000-0000
- Social Security numbers = 000-00-0000
- License plate numbers = typically limited to seven numbers and/or digits
- Phone numbers = (000) 000-0000
- The Seven Habits of Highly effective People
- Snow White and the Seven Dwarfs
- The Brady Bunch = Mom, dad and six kids
- Characters on Gilligan's Island = Gilligan, Skipper, Professor, Mr. & Mrs. Howell, Ginger and Mary Ann
- Seven Wonders of the World

Long-term memory refers to the storage of large amounts of information, procedures, events, and other memories for indefinite periods of time. The result is that when attendees recall earlier material learned years before, childhood experiences, workplace examples from throughout their career or any other similar details, they are pulling from long-term memory.

Scientists differ in their perspectives on how memories arrive in long-term memory. Many believe that information first goes to short-term memory where it is processed and forwarded on to long-term memory based on the significance of the information or event. Other researchers believe that short- and long-term memory are parallel rather than sequential in their functioning. The result of the latter theory is that information received can be simultaneously processed by short- and long-term memory.

The value of long-term memory from a presentation perspective is that you can design program information and activities that build on previous information and experiences possessed by audience members in order to strengthen current knowledge and skills and add new ones to those already in existence.

Source: Lucas, R.W., The Creative Training Idea Book: Inspired Tips and Techniques for Engaging and Effective Learning, AMACOM, New York, NY (2003)

Bob Lucas B.S., M.A., M.A, CPLP is an internationally-known author and learning and performance professional. He has written and contributed to thirty-one books and compilations. He regularly conducts creative training, train-the-trainer, customer service, interpersonal communication and management and supervisory skills workshops. Bob can be reached at blucas@robertwlucas.com or through his website www.robertwlucas.com. Follow his blog at www.robertwlucas.com/wordpress and like him at www.facebook.com/robertwlucasenterprises