

**Improving Memory and Learning Strategies**  
**Rick Grossman, Learning Strategies Specialist**  
**Tompkins Cortland community College**

There are whole courses on the topics of memory and learning. I believe it is very useful to understand how your memory works (and doesn't work). I use the memory process model and the thirteen memory principles to give you a basic understanding (see below). Why? Learning how your memory works helps you understand how and why some things "stick" in your head and others don't. With that, you can take control of your learning. It is important for you to have both a variety of learning strategies at your disposal and to understand why those strategies work (and why others don't). Learning strategies are not magic; they work because they use what we know about how our memory works and are applications of basic memory principles. In short, you can use your knowledge about the memory process, the memory principles, and your learning style to select appropriate learning strategies and adapt them to you and your needs. This is really the key to success!

**The 13 Memory Principles**

The 13 memory principles and memory process model, borrowed from Linda Wong's book Essential Study Skills (see below) are well worth a close look. Why? Because you can be a more efficient and effective learner if you use these principles. You can use your knowledge of the memory process and the 13 memory principles to analyze study tasks and select appropriate learning strategies. If you agree that these are basic principles to follow to improve your memory and learning, then they can be your guide when you study. How? Ask yourself if you have really learned this material by applying the memory process and memory principles as you study any given item. And, if you are trying to learn something, and it isn't sticking, you can use the memory process and memory principles to think about why and come up with logical alternative strategies.

**For example:** I am a student reading the summary of the 13 memory principles on the last page knowing that they are important and saying to myself: "O.K., I've got these down!" But, then, I ask myself, "Have I really learned this, using what I know about the memory process and memory principles?" I have to answer "No"! Then I think how I can apply them to this situation. I have *selected* this as being key material, but I haven't done much *elaboration* yet. Have I really gotten the 13 memory principles in my long-term memory (LTM)? - I haven't really done any *rehearsal*, maybe I need to try *writing* them down or try *reciting* them. 13 items is a lot for my short-term memory (STM) to handle, maybe I can break these up by *organizing* them some way into 2 or 3 smaller chunks, and work on them one at a time. How would I know if I really had them in my LTM? - I need to create a *feedback* system. And, I know that they may be sticking now and tough to *retrieve* later, so I better make a plan for *ongoing review*.

So, I decide to make a "Cornell style" review sheet (see below) (select, elaborate, and writing) and break up the 13 MP as the book does, into 3 chunks: SAVE, CRIB, FOTO (organizing). I decide to write the name of the principle, the description of it, and an example of it on the review sheet as much as possible "from memory" and then add from the book to make it complete (rehearsing into LTM). I'll start with the first 4 only SAVE - select, associate, visualize, and elaborate. Once I have the review sheet completed (for this first section), I'll cover up the right side, look at the questions on the left side, and try to recall and recite (or write out) the information (feedback). I'll do this for all 3 chunks and then have the review sheet so I can quiz myself the same way a couple more times before the next test (retrieval, ongoing review).

Clearly, there is no right or wrong approach - study cards and the Cornell-style review sheet accomplish the same objectives. What you select is based on your learning style. The process is what's important here. Yes, it takes time and effort; but, it will pay off in the long run! I realize it is not realistic to go through this whole process with everything you want to learn. But, again, my experience with lots of students on a one-on-one basis supports the need for more serious consideration of these basic principles when you study.

## The Memory Process Model

See below for a basic explanation of the memory process model.

Let's try to make sense of the memory process model with an illustration I hope will be helpful.

### For example:

I meet an old friend, Jose, at the store; he's just moved back to the area. We're both in a hurry; he tells me his cell phone number and I tell him I'll give him a call soon. I realize as soon as he walks away that I don't have my cell phone or a pen!

The number is 279-1600, so I choose to make some associations. My number also starts with 279, so I've got that. The house I grew up in was 16 Maplewood Drive. Bingo! 279-1600 - got it.

(I could have used the White House -1600 Pennsylvania Avenue and pictured my friend Jose sitting on the front steps of the house I grew up in or the White House!)

OR, I could do it this way... how about just reciting the number two-seven-nine, one-six-zero-zero over and over about five or six times.

OR, I could do it this way...how about closing my eyes and trying to see the number 279-1600 in my "mind's eye", maybe on Jose's forehead.

OR, I could do it this way (no pencil in sight)... use my finger like a pencil and the table top like a pen and "write" the number 279-1600 down a few times in a row.

Can you see what I'm doing and why? I'm using the rehearsal path in various ways to put the phone number into my long-term memory!

You have probably had similar experiences and used these kinds of strategies.

**There is no "best" way to get information into your long-term memory. The key is in the realization that many things "don't stick" because we did not work to put them into our long-term memory. Learning, even something as simple as a phone number, takes time and effort!** We often make the mistake of thinking that because we read or heard something and it made sense to us that it will "stick" The truth is, for most of us most of the time, if we don't work to make something "stick", we will lose it.

Feedback is important to discuss here. It is the process by which you ask yourself: "how will I know if this information is really stuck in my head?" and then come up with a way to test to see if is indeed, in there (meaning in your long-term memory)! So, when I ask myself: "What is Jose's number?" And reply to myself: "279-1600", I know it's in there! There are lots of ways to give yourself feedback for school information; one often-used approach is by making and using "study cards" (sometimes called flash cards).

We can use the "study card" example to illustrate the whole process in a basic way. I want to learn the definition and an example of the term "carnivore"; I think it will be on my next zoology test. I read it and identified it as being important (SM to STM). Next, I decide to make a study card. While I'm writing the card, I'm saying the information out loud (rehearsal- writing and reciting). I write "Definition and Examples of CARNIVORE" on the front of the card and "DEF: MEAT-EATING ANIMAL, EX: TIGER, WOLF" on the back of the card. Now, I quiz myself by looking at the front of the card and asking myself: "what is the definition and example of 'carnivore'?" and seeing if I can produce the answers without looking. Then, I look on the back to check my answer (feedback- it is either in my LTM or needs more rehearsal). A week later, the day before the test, I pull out my card and see if I can still answer the question on the front (retrieval and output).

I also want to comment on the limits of short-term memory (STM). We can only hold about 7 items in our STM at any one point. After that, there is an interference process that takes place. So, if we don't break things into smaller chunks and work them into our long-term memory (LTM) as we go, we overload the capacity of our STM and wind up losing information.

Think about these additional examples:

#1 You are reading (or watching) something and it all makes sense. Then at the end, you can hardly recall any of the details of what you read or saw! Why? You overloaded your STM - it all made sense, but wasn't worked into LTM and so much was lost. It is likely your brain "said": "Fine with me if you want to keep taking more and more into your STM but as you keep adding stuff, I'm going to have to dump out the older information that you never worked into your LTM to do it."

#2 You are reading (or watching) something and you realize that your eyes are still following along with the material but your brain is thinking about the last few points that were made and so the new stuff isn't even getting into STM. What happened? It is likely that your brain "said": "I can **EITHER** keep taking in new information into STM **OR** process the previous information into LTM, but I **CAN'T DO BOTH AT THE SAME TIME!**"

So, here are the key points:

1. To get anything from STM to LTM requires rehearsal and feedback. If you want to learn something, you have to be actively involved in storing it.
2. STM has a limited capacity. If you don't want to overload your STM, you have to take things in small chunks and process them thoroughly into LTM before going on.
3. If you want to really know if you have learned something, you have to use some method of feedback.
4. Once information is put into LTM, you can use the same feedback system (study cards, for example) to check retrieval from LTM as you did to put it in LTM in the first place.

### **13 MEMORY PRINCIPLES**

(Adapted from Linda Wong - Essential Study Skills, 8th Edition)

Using activities that apply these principles improve the effectiveness of your learning and memory.

**Selectivity** - The process of identifying the most important main points and details.

**Association** - The process of linking together new information to something familiar.

**Visualization** - The process of making mental pictures.

**Elaboration** - The process of actively thinking about and personalizing new information.

**Concentration** - The process of keeping attention focused on the task.

**Recitation or Writing** - The process of saying aloud or writing out what you are learning.

**Intention** - The process of creating a learning goal and desired outcomes.

**Big/Little Picture** - The process of looking for general ideas and the supporting information.

**Feedback** - The process of verifying what has been learned by through self-quizzing.

**Organization** - The process of logically arranging information you are learning.

**Time on Task** - The process of arranging and spending sufficient time on the task.

**Ongoing Review** - The process of regularly reviewing information learned previously.

**Multiple Modes** – The process of using a combination of learning style modes.

### **13 MEMORY PRINCIPLES REVIEW SHEET (Cornell Style)**

SAVE

Select

- description? Picking out the most significant information to study
- example? Using chapter summary, class handouts, study guide, lecture notes

Associate

- description? Linking new information to old information
- example? Linking a weather "depression" with psychological "depression"

### **THE MEMORY PROCESS MODEL**

(Adapted from Linda Wong - Essential Study Skills, 8th Edition)

Understanding the memory process helps create more efficient and effective learning strategies.

1. Sensory input is received from stimuli in the environment.
2. Short-term memory briefly stores the information. This storage area is limited in capacity and duration.
3. Information is moved along the rehearsal path. This is the stage where time and effort is put in to practice the information and work it into the long-term memory. This can involve reciting, writing, drawing, etc.
4. Information that is not yet learned is re-routed through the feedback loop. This is the self-quizzing stage. Either the information needs more rehearsal or it is in long-term memory.
5. Effectively learned information is stored in the long-term memory.
6. Retrieval is the process of accessing information stored in the long-term memory.