Memory: Studying and Building Memories

Module 21
Information Processing

Memory is learning that has persisted over time.

It is information that has been stored and can be retrieved.

Thinking and memory are flexible and capable of constant change...this can lead to errors.
The Study of Memory

- How does information get into memory?
- How is information maintained in memory?
- How is information pulled back out of memory?

Encoding

- Encoding is the organizing ____________________
  - This is the first step in the flow of memory
- Learners must encode information to store it.
Some information gets into memory automatically, whereas encoding other information takes conscious effort.

- These include paying attention, processing deeply, elaborating, and using mental imagery.

Remember Dual Processing?

- Divided attention involves concentrating on more

- Divided attention (multi-tasking) during encoding hurts performance on memory tasks, especially during retrieval

Attention

Do students often divide their attention by multi-tasking?
The term “levels of processing” refers to a continuum from shallow to intermediate to deep, with deeper processing producing better memory.

By adding meaning, developing organizations and associations, or relating it to things we already know, it can be stored for a lifetime.

It suggests that memory relies on how **deeply** we process information.

By adding meaning, developing organizations and associations, or relating it to things we already know, it can be stored for a lifetime.

Parallel Distributed Processing (PDP)

The brain performs multiple, parallel operations all at once, allowing memory is
Information Processing Model suggests that memory is very similar to a computer.

Memories are described as literal, “hard” data stored on a computer disk or hard drive.

- But human memories are often fuzzy and fragile.

Also, computers process one piece of data at a time, while human memory can process a lot of information at the same time.

Limitations of the information processing model

STORAGE:

Maintaining Information in Memory- Three-Stage Memory Model
Storage

- Storage involves maintaining the information available in memory
- Whenever people have access to

Example - if you look up a phone number, go to the telephone, and dial the number then memory is involved - even if for only seconds.

It’s a memory when...

- Sensory Memory performs the initial encoding of
- The sensory memory recodes a complete memory of the image, but it fades too rapidly for people to “read”

There are 3 Separate Memory Stores
Sensory Memory

- **Iconic Memory** is a ________________________________
  - Capacity: 4 ± 2 bits of info
- **Echoic Memory** is a momentary auditory memory ________________________________
  - Capacity: about 6 bits of info

Working memory is where ________________________________

- Allows you to comprehend what you are reading

The working memory has many limitations

- Short-term memory is a limited-capacity store that ________________________________
- Capacity:
  - “The magic number” (George Miller)
  - Humans have the ability to retain ________________________________
Why is it that…?

- Phone numbers are 7 digits?
- Social security numbers are 9 digits?
- Commercials use words in the phone numbers?

People can group information in ways to expand their short-term memory capacity.

- Memories disappear unless:
  - They are really meaningful so they get stored quickly into long-term memory
- Rehearsal:

How long can this information stay in STM?

- Memories disappear unless:
Long Term Memory

An unlimited capacity store that can hold information over length periods of time
- Capacity: ____________________________
- Duration: ____________________________

Information can be stored in separate units and some information can be retrieved without retrieving others
- Tip of the tongue phenomenon (temporarily inaccessible)

How Do We Get Information Out of Memory?

Retrieval