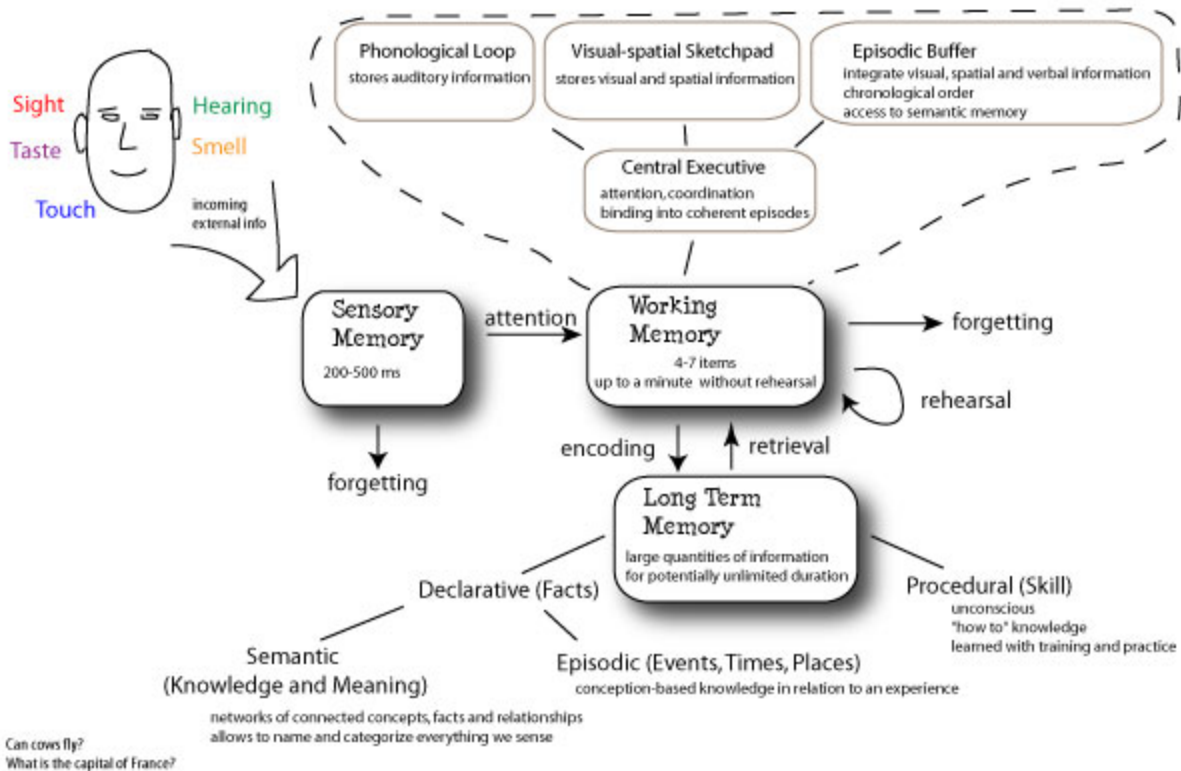


Human Memory System



(<http://softwarecreation.org/2008/the-programmers-brains-at-work-understanding-the-software-system/>)

Applied Memory Research (pp. 98-106)

Individual Differences

- a. in-born ability - IQ or photographic memory?
- b. expertise and learning: experience and practice to create your own "knowledge structure/organization"
- c. how to incorporate new information to the current knowledge structure

The Testing Effect

- a. testing boosts memory - testing as part of learning
 - i. robust effects regardless of the kinds of test styles and feedback

The Spacing Effect

- a. "distributed practice" (p. 103) - spreading lessons over time
 - i. high-stakes assignment: steady, frequent engagement with material is better for learning

The Interleaving Effect

- a. organizing lessons over time and between different topics, categories, skills, etc. if possible.

Desirable Difficulty

- a. more mental efforts (deep processing) leads to better learning.
 - i. design “slightly” more demanding learning activities

What Memory Principles Mean for Online Teaching and Learning (pp. 106-116)

Strategy 1: Include frequent tests and test-like activities

- a. Testing effect - testing as activity for learning as well as for evaluation
 - i. frequent low-stakes online tests
 - ii. publisher’s materials, free online Learning repository, instructor-created items, etc.
 - iii. basis for learning analytics

Strategy 2: Structure for spaced study

- a. Using online tools, design assignment and activities to push spaced study
 - i. Consistent schedules for assignments and activities
 - ii. Course announcement, calendars, text alerts

Strategy 3: Involve emotions (carefully)

- a. Emotionally aroused information (negative one in particular) is easier to remember.
- b. Online learning - lack of built-in emotional exchange and impact
 - i. Use videos (e.g., TED talks) as a required activity with a guided worksheet
 - ii. Sharing the work with the class or public (e.g., wiki, Youtube)
- c. Cautions with possible distraction (off-topic or overwhelming)

Strategy 4: Steer students into deep processing

- a. Superficial process through mere exposure vs. Deep processing for active learning
 - i. Self-reference - how is this info relevant to me? think of any personal examples, impact, interests, etc.
 - ii. Example: Online discussion with specific roles (starter and wrapper, p. 112)

Strategy 5: Base new knowledge on old knowledge

- a. Linking to pre-existing knowledge (previous course topics, everyday life, personal experience, etc.)
 - i. “The ability to interlink related pieces of information and visualize relationships within online environments is another example of how we can use the qualities of online media to boost memory” (p.114).
- b. Based on “learning analytics” (p.115), create more targeted/individually customized lessons