Learning Theories: Multimedia Learning Theory

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Overview

Mayer and Moreno's (1999) Cognitive Theory of Multimedia Learning states that deeper learning can occur when information is presented in both text and graphics than by text alone. The theory of Multimedia Learning hinges on the presumptions that there are two channels for learning: auditory and visual. These channels are both used to process information into working memory.

Auditory / Verbal Channel

Visual / Pictorial Channel
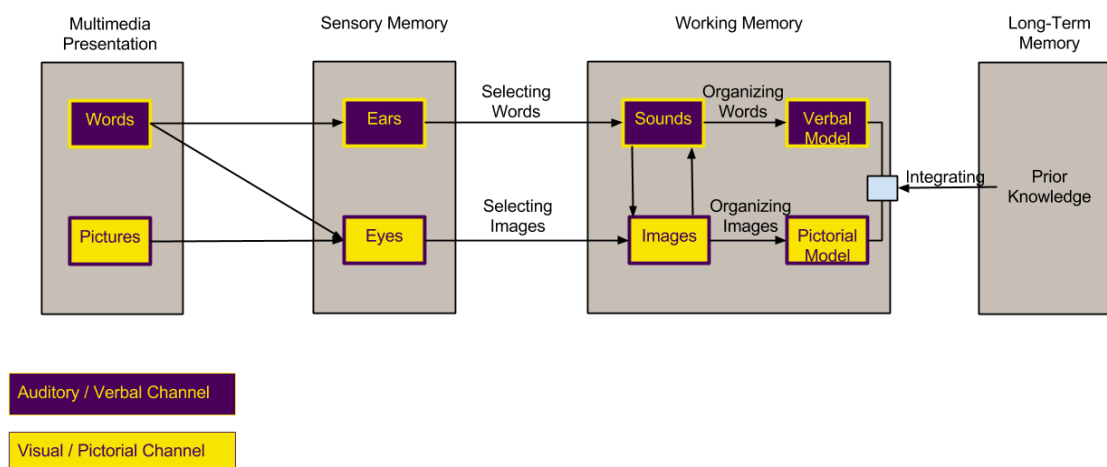
The Multimedia Theory of Learning can be broken down into a series of seven principles as defined by Clark and Mayer (2003):

- Multimedia Principle: Words and Graphics are Better Than Words Alone
- Contiguity Principle: Align Words to Corresponding Graphics
- Modality Principle: Present Words as Audio Narration, Rather Than On-Screen Text
- Redundancy Principle: Explain Visuals with Words in Audio or Text, Not Both
- Coherence Principle: Adding Interesting Material Can Hurt Learning
- Personalization Principle: Use Conversational Style and Virtual Coaches
- Segmenting and Pretraining Principle: Managing Complexity by Breaking a Lesson into Parts

This theory is predicated on the theories of cognitive load and information processing. Cognitive load occurs when extraneous information completes for the processing capabilities of the working memory and therefore interferes with the learning process. Information processing theory states that information we

learn passes through stages in our memory via a series of processes that allow it to be retained in long-term memory. Multimedia learning theory is based on the idea that when using multimedia, it is important to reduce cognitive load and therefore improve the information processing capabilities of our memory. Mayer and Moreno (2003) state: "A major challenge for instructional designers is that meaningful learning can require a heavy amount of essential cognitive processing, but the cognitive resources of the learner's information processing system are severely limited. Therefore, multimedia instruction should be designed in ways that minimize any unnecessary cognitive load" (p. 50).

Implications for the Classroom

- In the presentation of information, use both words and graphics to provide instruction or content
- Keep text and graphics aligned
- Use narration whenever possible, but do not use narration and on-screen text at the same time
- Avoid using images, audio, transitions and other elements that distract or that do not relate to the content
- Use conversational style and consider using avatars or virtual learning coaches to guide learning
- Break lessons into small "chunks" of 10-15 minutes maximum

Teaching Strategies that support this Learning Theory

1. Blended or flipped instruction
2. Gamification or game-based learning
3. Teaching with Social Media

Technology Tools that support this Learning Theory

1. MediaSpace and CaptureSpace Lite
2. D2L Brightspace
3. HD Recording Studio

On the Web

- Cognitive Theory of Multimedia Learning
- Mayer's Theory of Multimedia Learning Unpacked and Illustrated
- Designing for Mobile Learning: Clark and Mayer's Principles Applied

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