Cognitive Load Theory: Implications for Instruction

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Information Processing Model

Axelrod, 1973
Working Memory

Baddeley, 2012
Schemas

- “A schema is a pre-existing assumption about the way the world is organized.” (Singer, 1968)

- Piagetian Schema Development:
  - Assimilation
  - Accommodation
Types of Cognitive Load

• Intrinsic
  – Addition, subtraction, multiplication, division
  – Is a function of element interactivity
  – Manage it

• Extraneous (Irrelevant)
  – Gamification, teamwork, online environment, etc.
  – Reduce/Eliminate it

• Germane ( Relevant )
  – Schema construction
  – Increase it
Eight Principles of Cognitive Load Theory Applied to Multimedia Design

1. Multimedia principle
   - Deeper learning from *words and pictures* than from *words alone*

2. Contiguity principle
   - Deeper learning from presenting words and pictures simultaneously rather than sequentially

Mayer, 2002
Eight Principles of Cognitive Load Theory Applied to Multimedia Design

3. Coherence principle
   - Deeper learning when extraneous words, sounds, images are excluded

4. Modality principle
   - Deeper learning when words are presented as narration rather than as on-screen text

Mayer, 2002
Eight Principles of Cognitive Load Theory Applied to Multimedia Design

5. Redundancy principle
   - Deeper learning when words are presented as *narration* rather than as *both* narration and on-screen text

6. Personalization principle
   - Deeper learning when words are presented in *conversational* style rather than in formal or academic style

Mayer, 2002
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7. Interactivity principle
   – Deeper learning when learners are allowed to control the presentation rate than when they are not*

8. Signaling principle
   – Deeper learning when key steps in the narration are signaled rather than not

* Mayer, 2002
Instructional Gold Standard

- Worked examples
- Diversity of examples
- Decomposition of complex tasks
- Scaffolding/Support

Kirschner, Sweller, & Clark, 2006
References


References


