

Cognitive Load and Multimedia 1 (Extraneous)



**PRACTICES
THAT FOSTER
EFFECTIVE LEARNING**

LEARNER IMPACTS

- Self-regulation
- Achievement

DESCRIPTION

Cognitive load theory relates to the capacity of working memory and its effect on long-term memory schema acquisition. Cognitive load is divided into three categories: intrinsic load, extraneous load, and germane load. Extraneous cognitive load stresses the capacity of learners' working memory. Since this type of cognitive load is caused by poor instructional design, it can be reduced with multimedia instructional methods. The following multimedia instructional methods outlined in *Digital design to reduce extraneous cognitive load* are both tested and actionable (Mayer, 2009).

1. Coherence
2. Signaling
3. Redundancy
4. Spatial contiguity
5. Temporal contiguity

The cognitive theory of multimedia learning has three underlying assumptions: the dual channel assumption (Clark & Paivio, 1991; Paivio, 1986, 2006; Baddeley, 1992, 1999); the limited capacity assumption (Baddeley, 1992, 1999; Sweller, 1994, 2005; Chandler & Sweller, 1991); and the active-processing assumption (Chambliss & Calfee, 1998; Cook & Mayer, 1980).

CAPABILITIES

- Assessment: Software simulation
- Instruction: Player + item
- Instruction: Multimedia active reading

SAMPLE DESIGN IMPLEMENTATIONS

- Robust Technology: Software simulation
- Simple Technology: Standalone instructional multimedia with assessment items
- Content Support: Instruction/practice of designing multimedia



Pearson

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SELF-ASSESSMENT INSTRUMENT



Principle Criteria	Integration (4-5 points)	Exploration (2-3 points)	Consideration (1 point)	Not Applicable (0 Points)	Total Points
Coherence	Strong application of coherence in multimedia design	Some application of coherence in multimedia design	Poor application of coherence in multimedia design	Does NOT use effectively or is not a related activity	= ____
	Strong use of only relevant audio-visuals	Some use of only relevant audio-visuals	Poor use of only relevant audio-visuals		
	Strong use of concise text	Some use of concise text	Poor use of concise text		
Signaling	Strong application of signaling in multimedia design	Some application of signaling in multimedia design	Poor application of signaling in multimedia design	Does NOT use effectively or is not a related activity	= ____
	Strong use of cues to highlight the organization of material	Some use of cues to highlight the organization of material	Poor use of cues to highlight the organization of material		
	Strong use of cues to prioritize the most important material	Some use of cues to prioritize the most important material	Poor use of cues to prioritize the most important material		
Redundancy	Strong application of redundancy in multimedia design	Some application of redundancy in multimedia design	Poor application of redundancy in multimedia design	Does NOT use effectively or is not a related activity	= ____
	Strong use of video that contains visuals with narration only OR text with visuals only	Some use of video that contains visuals with narration only OR text with visuals only	Poor use of video that contains visuals with narration only OR text with visuals only		
Contiguity	Strong application of contiguity in multimedia design	Some application of contiguity in multimedia design	Poor application of contiguity in multimedia design	Does NOT use effectively or is not a related activity	= ____
	Strong presentation of adjacent graphics and text	Some presentation of adjacent graphics and text	Poor presentation of adjacent graphics and text		
	Strong presentation of corresponding audiovisuals in a synchronized format	Some presentation of corresponding audiovisuals in a synchronized format	Poor presentation of corresponding audiovisuals in a synchronized format		