

Beyond Fads, Fables, & Folklore

Evidence-Based Practice & Workforce Learning Session SU 200

While you are waiting, work on the pretest on page 3!



By the end of this session you will be able to apply research evidence to address the following workforce learning issues:

- Is learning better in face-to-face or e-learning delivery media?
- What kinds of visuals promote learning?
- How should audio and text be used to explain visuals?
- What is the best type and placement of practice exercises?

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While you are waiting

Try this pretest while you are waiting for the session to start

- | | | |
|---|------|---------|
| 1. Learning is better with visuals than without visuals | Fact | Fiction |
| 2. It's best to explain a visual with audio narration AND text | Fact | Fiction |
| 3. Visuals and stories added for interest improve learning | Fact | Fiction |
| 4. Better learning is realized when practice is spread over a training session than when in 2 or 3 places | Fact | Fiction |
| 5. Overall, learning is better in a face-to-face classroom than in e-Learning | Fact | Fiction |

Session Agenda

- What is evidence-based practice?
- Grade these samples
- Face to face classrooms versus virtual classrooms: the evidence
- How people learn
- Visuals and learning: the evidence
- Audio and text to explain visuals: the evidence
- Interactions and learning: the evidence

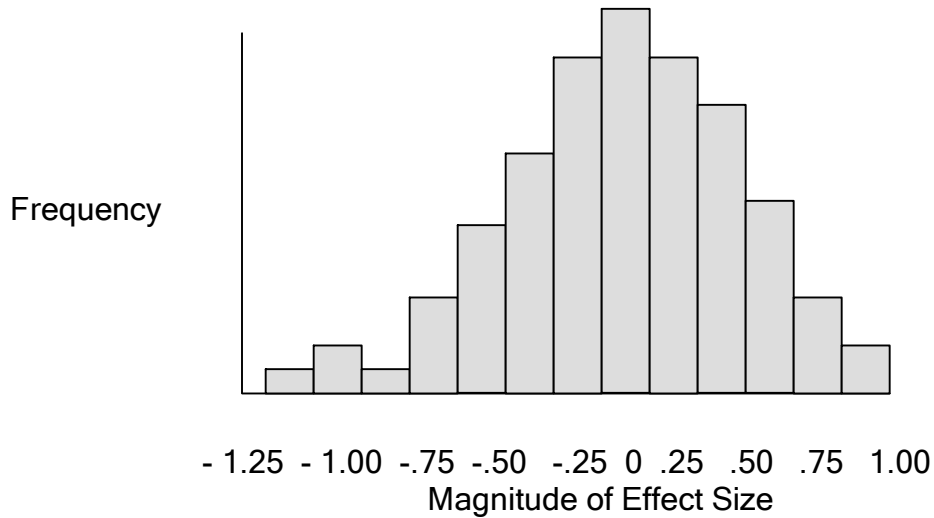
Activity 1: Critique the e-Learning Samples

Grade the sample for instructional effectiveness: A - F. Then write a summary of the reasons for your grade e.g. what elements were effective or ineffective?

Sample	Your Grade	Reasons
Virtual Classroom		
Asynchronous E-learning		

Research Data: F2F vs. Electronic Distance Learning

Distribution of 318 Achievement Effect Sizes:



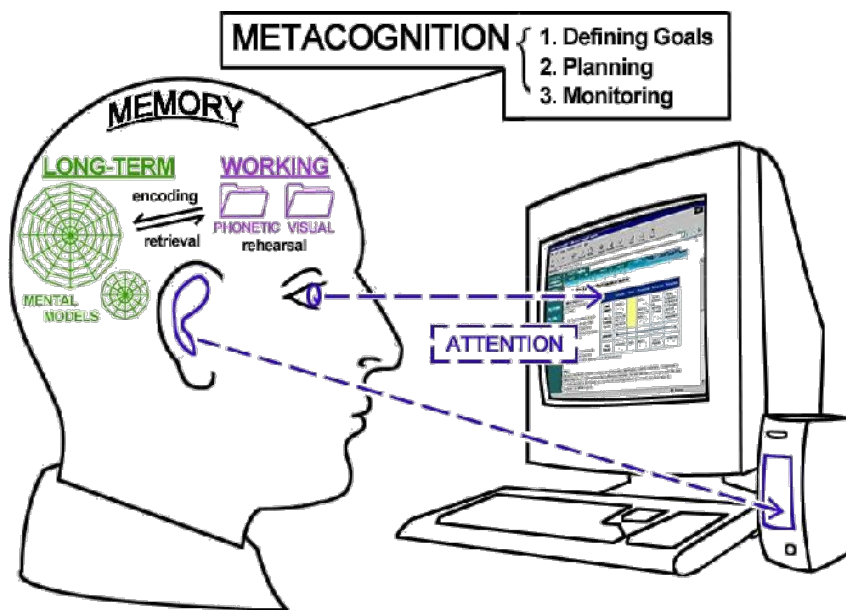
From Bernard et al (2004), p. 398

Conclusion:

Methods Vs Media

Component	Definition	Examples
Media	The technology used to deliver the training	Computer - Virtual Classroom Book Instructor -face-to-face
Method	Techniques that promote learning	Visuals Examples Practice Exercises

How People Learn



Chess research conclusions:

- Working Memory has limited capacity of 7 ± 2 chunks
- Chunk size depends on prior knowledge
- Use instructional methods that support the following learning processes:
 - Attention
 - Activation of prior knowledge
 - Rehearsal for encoding
 - Retrieval
 - Metacognition

Do Visuals Improve Learning? What the Evidence Says

Principle	Guideline
Multimedia	
Coherence	

Communication Functions of Visuals From *Graphics for Learning* by Clark & Lyons p. 15

Function	A Graphic Used To	Examples
Decorative	To add aesthetic appeal or humor	- Book cover art
Representational	Depict an object in a realistic fashion	- A screen capture - An equipment photo
Mnemonic	Provide retrieval cues	- a letter in a shopping cart for carta (letter)
<i>Organizational</i>	Show qualitative relationships	- A concept map
<i>Relational</i>	Show quantitative relationships	- a bar graph
<i>Transformational</i>	Show changes over time or space	- an animation of weather cycle
<i>Interpretive</i>	Illustrate a theory, principle, invisible phenomena	- Equipment schematic

Activity 2: Functions of Visuals

Write next to each number below the most likely visual communication function(s) shown in the sample:

1. Sample 1
2. Sample 2
3. Sample 3
4. Sample 4

How to Use Text and Audio to Explain Visuals: What the Evidence Says

Principle	Guideline
Modality	
Redundancy	

When Modality Applies:

- Content or visual are complex
- Words needed to understand the visual
- Learners are novice
- Instructional pacing (instructor-led)
- Words NOT needed for reference
- Words in native language

From *e-Learning and the Science of Instruction - 2nd Edition* by Clark and Mayer (2007)

Interactions and Learning: What the Evidence Says

Principle	Guideline
Context	
Distribution	

From Clark, 2003, *Building Expertise*

Interactive Facilities in the Virtual Classroom

- Polling Whiteboard
- Chat Application Sharing
- Audio Break out room

From Clark & Kwinn (2007) *The New Virtual Classroom*

Resources and References

Bernard, R.M et al (2004). How does distance education compare with classroom instruction: A meta-analysis of the empirical literature. *Review of Educational Research* 74(3), 379-434.

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Evidence-Based Practice in Workforce Learning: Summary of Principles

Principle	Guidelines	For More Information
Multimedia	Learning is better with relevant visuals	E-Learning & The Science of Instruction
Coherence	Learning is depressed by extraneous visuals, stories, and words	E-Learning & The Science of Instruction
Modality	Learning is better when visuals are explained by words in audio	E-Learning & The Science of Instruction Efficiency in Learning
Redundancy	Learning is better when visuals are explained by words in text OR audio but NOT both	E-Learning & The Science of Instruction Efficiency in Learning
Encoding specificity	Learning is better when practice reflects the context of the work task	E-Learning & The Science of Instruction Building Expertise
Distribution	Learning is better when practice is distributed throughout the event	E-Learning & The Science of Instruction Building Expertise