eLearning Narration Quick Guide

By Kely McKeown
Class Assignment for:
Masters of Science, Instructional Design and Technology
California State University, Fullerton

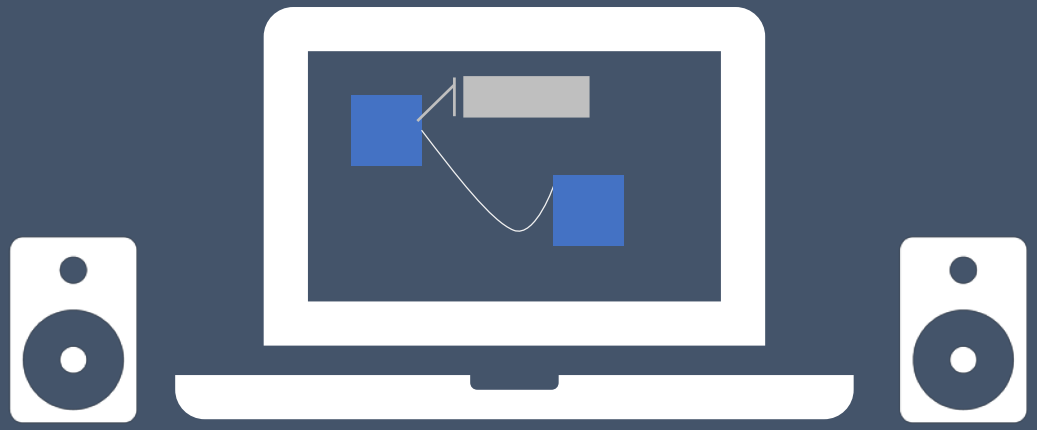
Belief:

It’s better to narrate the text because learners can both read and listen at the same time.

What research says:

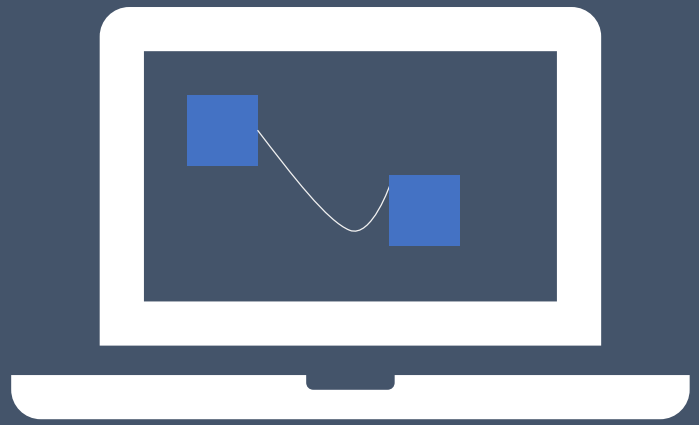
Simultaneous text and audio creates cognitive overload. Remove redundancies in multimedia learning.

“Redundancy Principal”



Belief:

Animations should have both narration and the same words on-screen so learners can see and hear what the animations are about.



What Research Says:

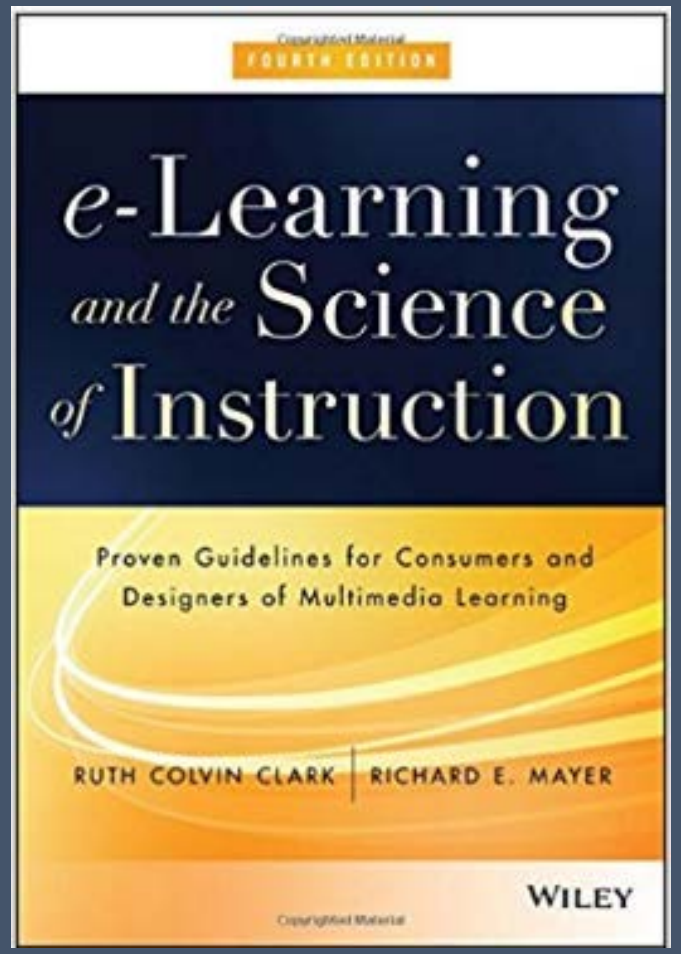
Learners can reach high levels of cognitive overload when three modalities are presented simultaneously.

Belief:

On-screen text labels and short sentences are okay because the learner can quickly read them.

What Research Says:

Two or three **s**hort action oriented labels with key words from the narration help guide learner's attention and aids in content retention.

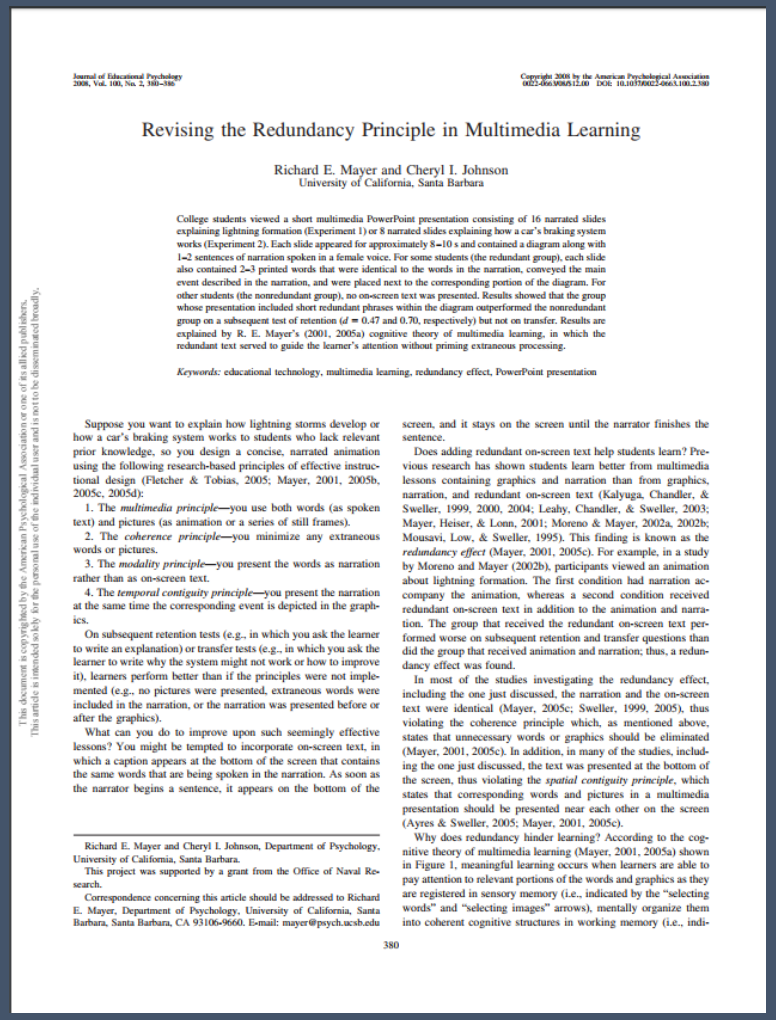


Want to learn more?

Read this book:

E-Learning and the Science of Instruction | Proven Guidelines for Consumer and Designers of Multi-Media Learning
Ruth Colvin Clark and Richard E. Mayer

John Wiley & Sons
ISBN: 978-1-119-15866-0
March 2016, 528 pages



Journal of Educational Psychology
2008, Vol. 100, No. 2, 380–386

0022-0663/08/$12.00 DOI: 10.1037/0022-0663.100.2.380

Revising the Redundancy Principle in Multimedia Learning

Richard E. Mayer and Cheryl I. Johnson
University of California, Santa Barbara

College students viewed a short multimedia PowerPoint presentation consisting of 16 narrated slides explaining lightning formation (Experiment 1) or 8 narrated slides explaining how a car's braking system works (Experiment 2). Each slide appeared for approximately 8–10 s and contained a diagram along with 1–2 sentences of narration spoken in a female voice. For some students (the redundant group), each slide also contained 2–3 printed words that were identical to the words in the narration, conveyed the main event described in the narration, and were placed next to the corresponding portion of the diagram. For other students (the nonredundant group), no on-screen text was presented. Results showed that the group whose presentation included short redundant phrases within the diagram outperformed the nonredundant group on a subsequent test of retention (d = 0.47 and 0.70, respectively) but not on transfer. Results are explained by R. E. Mayer's (2001, 2005a) cognitive theory of multimedia learning, in which the redundant text served to guide the learner's attention without priming extraneous processing.

Keywords: educational technology, multimedia learning, redundancy effect, PowerPoint presentation

Suppose you want to explain how lightning storms develop or how a car's braking system works to students who lack relevant prior knowledge, so you design a concise, narrated animation using the following research-based principles of effective instructional design (Fletcher & Tobias, 2005; Mayer, 2001, 2005b, 2005c, 2005d):

1. The *multimedia principle*—you use both words (as spoken text) and pictures (as animation or a series of still frames).
2. The *coherence principle*—you minimize any extraneous words or pictures.
3. The *modality principle*—you present the words as narration rather than as on-screen text.
4. The *temporal contiguity principle*—you present the narration at the same time the corresponding event is depicted in the graphics.

On subsequent retention tests (e.g., in which you ask the learner to write an explanation) or transfer tests (e.g., in which you ask the learner to write why the system might not work or how to improve it), learners perform better than if the principles were not implemented (e.g., no pictures were presented, extraneous words were included in the narration, or the narration was presented before or after the graphics).

What can you do to improve upon such seemingly effective lessons? You might be tempted to incorporate on-screen text, in which a caption appears at the bottom of the screen that contains the same words that are being spoken in the narration. As soon as the narrator begins a sentence, it appears on the bottom of the screen, and it stays on the screen until the narrator finishes the sentence.

Does adding redundant on-screen text help students learn? Previous research has shown students learn better from multimedia lessons containing graphics and narration than from graphics, narration, and redundant on-screen text (Kalyuga, Chandler, & Sweller, 1999, 2000, 2004; Leahy, Chandler, & Sweller, 2003; Mayer, Heiser, & Lonn, 2001; Moreno & Mayer, 2002a, 2002b; Mousavi, Low, & Sweller, 1995). This finding is known as the *redundancy effect* (Mayer, 2001, 2005c). For example, in a study by Moreno and Mayer (2002b), participants viewed an animation about lightning formation. The first condition had narration accompany the animation, whereas a second condition received redundant on-screen text in addition to the animation and narration. The group that received the redundant on-screen text performed worse on subsequent retention and transfer questions than did the group that received animation and narration; thus, a redundancy effect was found.

In most of the studies investigating the redundancy effect, including the one just discussed, the narration and the on-screen text were identical (Mayer, 2005c; Sweller, 1999, 2005), thus violating the coherence principle which, as mentioned above, states that unnecessary words or graphics should be eliminated (Mayer, 2001, 2005c). In addition, in many of the studies, including the one just discussed, the text was presented at the bottom of the screen, thus violating the *spatial contiguity principle*, which states that corresponding words and pictures in a multimedia presentation should be presented near each other on the screen (Ayres & Sweller, 2005; Mayer, 2001, 2005c).

Why does redundancy hinder learning? According to the cognitive theory of multimedia learning (Mayer, 2001, 2005a) shown in Figure 1, meaningful learning occurs when learners are able to pay attention to relevant portions of the words and graphics as they are registered in sensory memory (i.e., indicated by the "selecting words" and "selecting images" arrows), mentally organize them into coherent cognitive structures in working memory (i.e., indi-

Richard E. Mayer and Cheryl I. Johnson, Department of Psychology, University of California, Santa Barbara.

This project was supported by a grant from the Office of Naval Research.

Correspondence concerning this article should be addressed to Richard E. Mayer, Department of Psychology, University of California, Santa Barbara, Santa Barbara, CA 93106-9660. E-mail: mayer@psych.ucsb.edu

Want to learn more?

Read this article:
"Revising the redundancy principle in multimedia learning."

Richard E. Mayer and Cheryl I. Johnson,
University of California, Santa Barbara

References:

Mayer, R. E., & Johnson, C. L. (2008, May). Revising the redundancy principle in multimedia learning. *Journal of Educational Psychology*, *100*, 380-386.

Clark, R.C., Mayer, R.R. E-Learning and the Science of Instruction, 4th edition, (2016, March) ISBN-10: 1119158664