

**Book Review: e-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning (2nd edition)**  
by Ruth Colvin Clark and Richard E. Mayer (2008)

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As a novice librarian, I was excited to start making online tutorials for our students. I spent hours tinkering with Adobe Captivate, taking advantage of the clever features that the software offered. When I showed my first video to a colleague, she was politely complimentary, but she also said, “What exactly is this video about? Because it looks like a video about all the neat things you can do with Captivate, and not really like a library instruction video.”

If you’re an experienced librarian, you probably would not make the same mistakes I did and thus you’ll have instructional objectives serving as the backbone of your tutorial. You will also know why we librarians are making these tutorials in the first place - today’s students and patrons expect to access most, if not all, of the information they need without ever leaving their computer, including library instruction. Consequently, we now offer instruction in the form of tutorials - also known as screencasts, Flash tutorials, or multimedia tutorials - a type of teaching in which the instructor is separated from the student by time and space.

But even good instructional objectives may not be enough to produce a successful online tutorial. Teaching through a screen is not like teaching face to face, or even through the medium of print. Are we thinking about our lessons in a way suited to electronic instruction? How can we ensure that our students are getting something out of an online tutorial, that they don’t forget everything the tutorial has to say five minutes after they finish it?

In *e-Learning and the Science of Instruction* (2nd ed.), Ruth Colvin Clark, an experienced training and development expert, and Richard E. Mayer, a professor of psychology at UC Santa Barbara, give us tools to make tutorials that enhance and support the learning process. They offer research-based guidelines based not on intuition or just some personal experiences, but on research, so that instructors can carefully plan tutorials to help students learn as much as possible from them. This second edition has been revised to incorporate the latest research, and includes two new chapters, one on critical thinking and one on gaming, as well as a CD-ROM illustrating the principles outlined in the book.

This useful book is structured so that the busy tutorial maker can read only the relevant sections in order to achieve a specific task. For example, you can read Chapter 10, Leveraging Examples in e-Learning, about the most efficient ways of using examples in your tutorial in order to help students build and reinforce their skills. But because you aren’t required to read Chapters 1 through 9 in order to get anything out of it, the chapter (like all chapters) stands alone. Chapters begin with a chapter outline, a “design dilemma” that applies the chapter’s main topic in a dramatized situation, then go on to an explanation of the main topic or principle, and finally an overview of the research that supports it. At the end of each chapter, there is a short preview of the next chapter and a list of suggested readings, as well as a brief description of how the chapter’s principle plays out on the accompanying CD.

These e-learning principles address small, specific tutorial elements, such as placing words, graphics, and audio in your tutorial, structuring your tutorial effectively, incorporating opportunities for student practice, and using navigation elements, such as the “next” button, in order to allow students to go through the tutorial at their own pace. Paying attention to these practical essentials leads to greater student learning, because they affect what the authors call “cognitive load”: the ability of the student to hold a certain amount of information in short-term memory. Once the new information is successfully placed into short-term memory, the video tutorial can help the student transfer this information into long-term memory through the use of examples and practice sessions built into the lesson.

Every principle is clarified by an explanation of the psychological reasons for the principle, supported by research evidence. The authors rely on what they consider exemplary studies: high-quality experimental research conducted on relevant populations with replicable and statistically significant results, in which learning is measured by tests that measure application rather than recall. This distinction is important, because applying the lesson, rather than recalling memorized information, is usually the goal in the workforce (workforce learning being a concern of the authors). This is also a goal for instruction librarians—we want our students to be able to use what

they've learned, not just recite a list of rules for composing a good search strategy.

Two of the principles cleared up a nagging question I had about some tutorials I'd seen. When watching a tutorial that presented a picture or a table with an audio narration accompanied by the same text on screen, I often felt slightly impatient; thus I would often go to the next slide before the audio narration finished, once I'd read all the screen text. I always felt a little guilty about this—was I shortchanging myself of the full learning experience simply because I read the text faster than the narrator could read it? I had heard good reasons elsewhere for including both written and audio explanations—to accommodate different learning styles, for example, or to assist learners challenged in seeing or hearing. Colvin Clark and Mayer devote two chapters to explaining that first, if only one these modes is used to explain a graphic or an animation, more learning is likely to occur through audio explanation rather than on-screen text; second, the presence in such situations of both written and audio explanations on a slide can significantly interfere with the learning process. Instead, they recommend in the most common circumstances to present a screen graphic illustrating the lesson (i.e., not the complete, on-screen text of the audio), accompanied by audio narration for the best learning gains.

Instruction librarians will likely already know about tutorials already in existence, such as TILT (<http://tilt.lib.utsystem.edu/>), the tutorials in ACRL's PRIMO database (<http://www.ala.org/apps/primo/public/search.cfm>), the many useful ANTS tutorials ([\[ants.wetpaint.com\]\(http://ants.wetpaint.com\)\), as well as the collection of tutorial resources available through LOEX \(<http://www.emich.edu/public/loex/resources.php>\). There are excellent examples to choose from, but these examples are many, and use a variety of instructional techniques. Looking at all of them to discern the best principles of e-learning creation would be next to impossible. Guidelines such as the ACRL Instructional Technologies Committee's Tips for Developing Effective Web-Based Library Instruction \(<http://www.ala.org/ala/mgrps/divs/acrl/about/sections/is/committees/instrtech.cfm>\) and William Badke's guidelines for ANTS tutorials \(<http://www.acts.twu.ca/lbr/antsguidelines2008.htm>\) are also useful and worth a look, but these are higher-level guidelines that do not have the amount of detail and support found in Colvin Clark and Mayer's book.](http://</a></p>
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What this book shows is that we can do specific things with our video tutorials to ensure that we maximize learning for our students. A lot of things are out of our control—the physical conditions under which our tutorials are viewed, the student's attitude, level of interest, and attention span, whether or not students watch a video all the way to the end. Ensuring the educational value of a video, however, is within our control. By using these research-based guidelines, we can, for example, make a video that is short (thus minimizing the attention-span problem) and does not contain any extraneous elements such as background music or gratuitous animation. We know from reading this book that something we include in a video because we think it will "add interest" may in fact detract so greatly from the learning goals that the student may not learn anything at all. We now know to choose only those elements that contribute directly to learning.

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*(What's mine is yours...Continued from page 5)*

after the session searching more wisely and with a greater appreciation of the containers of scholarly information that libraries offer. A one-shot session featuring the use of delicious could still begin with a library database, but would then lead students into the practice of information selection and content tagging, whether in their own delicious site or one created for the entire class. By experiencing this process of constructing a collection of information, students will develop more advanced ways of thinking about information access and use, thereby empowering them to be thoughtful and aware participants in the scholarly research enterprise.

For students involved in researching and learning in their particular area of study, be it Gender Studies or English or another field, this type of interaction with information is crucial. It allows an understanding of the democratic nature of information and the power afforded by its effective searchability, availability, and dissemination. Beyond that, introducing students to a freely available tool like delicious that allows tracking and organizing of information is a bonus.

Based on this experience with delicious, I should be satisfied with the Librarian 2.0 moniker. But ultimately, it was not the technological tool that brought about the design of this assignment; instead, it was my hope that the students have a better understanding of the nature of scholarly information, regardless of the technologies they use to access it, collect it, or label it.