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A Conversation with Dr. Ruth Clark



Dr. Ruth Clark's professional focus is design and development of effective instructional environments based on empirical research and human psychological learning processes. As President of Clark Training and Consulting (www.Clarktraining.com) for over 15 years, she and her staff offer skill building seminars on needs assessment, design of training for classroom and e-Learning, as well as cognitive principles of learning to a wide variety of business and government clients including Canada Customs and Revenue Agency, Intel, Wells Fargo, Bristol Myers Squibb, and agencies associated with the US Department of Defense.

*Ruth has authored four books including: **Developing Technical Training, Building Expertise, and E-Learning and the Science of Instruction** coauthored with Dr. Richard E. Mayer. Her most recent book, **Graphics for Learning**, coauthored with Chopeta Lyons, was published in April 2004.*

She spoke with Ramona Materi of Ingenia Training (www.ingenia-training.com) about e-Learning and her latest research.

By Ramona Materi

CLJ: *What is your definition of e-Learning?*

Clark: In *E-Learning and the Science of Instruction* we defined e-Learning quite broadly as: "content and instructional methods delivered on a computer with the goal of improving desired organizational outcomes." Because most research to date has been conducted on asynchronous forms of self-study tutorials, most of our examples reflect this type of e-Learning.

Recently I wrote a chapter on e-Learning for Richard Mayer's forthcoming *Handbook on Multimedia Learning*. I suggest that we can't generalize about e-Learning per se; there are so many significant varieties of e-Learning. First we have asynchronous and synchronous forms which have very different capabilities. Additionally, some e-Learning is designed to improve performance by building new knowledge and skills. In contrast, other e-Learning is designed primarily to deliver

information such as new policies. Finally, e-Learning can be designed based on four different course architectures: receptive, directive, guided discovery or exploratory. In sum, with so many different incarnations of this thing we call e-Learning, we really cannot make meaningful instructional generalizations about "e-learning". Basically the computer is a delivery device and it's how we design the instructional methods and content that will determine effectiveness of any e-Learning program.

CLJ: *What is unique or different about instructional design for e-Learning as compared to designing for the classroom?*

Clark: Whatever delivery media you use, you need to be aware of the features of those media and ask, "How can I exploit the unique features of that medium to best promote learning?" Compared to the classroom, some of the unique media

features we can exploit in e-Learning include simulations, self-paced interactions with automated feedback, animations, and screens rather than pages.

In the classroom we rely on the instructor to be monitoring the learners, pitching in with their own stories, adding additional instruction where needed. In asynchronous e-Learning, you don't have that luxury. It has got to be very self-contained and requires a more disciplined design than classroom training where we do rely on that instructor to fill in the gaps. You can't just get by with a series of sketchy PowerPoint® screens and then assume: "OK, the instructor will fill in with additional content, will answer the questions, will add examples, and in some cases will even make up their own exercises or discussions". You have to be rigorous with your job and task analysis and design process.

CLJ: *It's been two years since **E-Learning and the Science of Instruction** has come out. What has been the reaction of the instructional design community to it?*

Clark: I was really pleased with the reception to this book – according to the publisher, it was their number one best seller last year. The International Society for Performance Improvement awarded it with Outstanding Instructional Communication in 2004.

I'm hoping that we're starting to professionalize — meaning people increasingly understand that training is an expensive investment, technology is complex and we need to leverage our work on the basis of scientific evidence. The core of the book is about the research evidence we have for basic design decisions. For example, how do we best use text, pictures, and audio and how do we combine those elements for the greatest learning effectiveness? I think people are more interested not only in what to do, but the evidence and the psychological rationale for their design decisions.

CLJ: *What are your thoughts on the quality of e-Learning being produced today?*

Clark: I see two extremes in poor quality e-Learning. First is what I would call a transmission mode of learning such as taking some PowerPoint® slides and putting them on a computer. Then at the other extreme are the programs that abuse technology. You see elaborate simulations or irrelevant themes that are counterproductive to learning. Both of these extremes ignore what we know about how humans learn best.

In the *Handbook on Multimedia Learning* chapter, I specifically reviewed research on simulation and games. Simulations and games — like e-Learning — are fuzzy constructs with very diverse implementations. Games can range from the Jeopardy game, which is kind of a low level, factual interaction to quite sophisticated things like high-end military simulations which, if well designed, are probably effective. It all goes back to asking: What is the learning outcome, what is the goal and how do we best match the technology to it? In general, many of the high tech “whizzy” e-Learning environments increase cognitive load and can depress learning.

Synchronous forms of e-Learning are quite different in their capabilities from

asynchronous. Synchronous e-Learning has been used for a while in higher education but now I'm seeing it take off a lot more among corporate trainers. We don't have much evidence for best ways to use synchronous learning environments. However, until more evidence surfaces, we can apply what we have learned from research on asynchronous e-Learning and what we know about human learning processes.

CLJ: *What is getting in the way of better designed e-Learning?*

Clark: The number one problem is time.

People have to get things out in three weeks or a month. Budget can only compensate for that to a certain degree. You

can always throw 25 instructional designers on a project but you still have to coordinate all those people's efforts. I really feel empathy for a lot of the training professionals I teach in seminars, because they are given such unrealistic timeframes. I think that is one reason why synchronous e-Learning, which can be designed a little faster, is going to grow as a delivery alternative. From a design perspective it may take a little longer than classroom training, but you do have that robustness I mentioned previously with the instructor present. Additionally, when migrating training from classroom to e-Learning, synchronous environments are easier to design than asynchronous.

The other big constraint instructional professionals face is that many of our clients have been to school for many years and consider themselves learning experts. Our clients tell us what they want, when they want it and how it should be done. We

don't have the professional recognition and the credibility that other professions do and my hope is in the next 20 years we'll get a lot more of that. I think part of the key is evidence-based practice, to know what the research is and begin to apply that.

CLJ: *How do we convince clients and subject matter experts of the value of instructional design?*

Clark: There are a number of keys. One is being able to speak in the client's language, to present research to them in informal terminology. A lot of people who've read *E-Learning and the Science of Instruction* say it's great because they can show clients

all the little bar charts that represent data regarding which methods work better.

Another key is to evaluate your instruction. When I was a training manager at least 10 per cent of all major projects' budgets were allocated for evaluation. You can say to managers, “This is your program and your decision, but I would be remiss if did not tell you that...” If you evaluate, you can go back later, for the current client or another client, and say that “our evaluation showed us that...”.

Part of the problem is that managers see training as a way to dump their problems onto the training department. Sometimes training is not the solution at all. One solution is to assume the broader role of performance consultant. In that role you work as problem solvers — not as single

solution vendors. Don't oversell e-Learning. Work as a partner with clients, determine if training will meet their operational goals and if so, what role the computer should play.

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Keynote Presentation:

Dr. Ruth Clark

E-Learning and the Science of Instruction:

Research-based Guidelines for the Selection and Design of e-Learning

Tuesday, November 2

9:00 – 10:00 am, Room 718

Book Signing:

Tuesday, November 2

10:00 – 10:30 am

and

2:30 – 3:00 pm

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Interview with Dr. Ruth Clark

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CLJ: You have a new book out, *Graphics for Learning*. What was the impetus

behind this and what is the book about?

Clark: First, when you think about your own education, from kindergarten to graduate school, it focused on verbal literacy. Visual literacy was entirely neglected. For most of us, any graphics training we had was an elective. As a result, I suspect that most people are like me – lacking in knowledge and skills in visual communication.

There are two other pieces. We have some good research in the last 15 years that is much better than what we had in the past. As well, if I want to put in a visual, I can easily access all kinds of great clip art online. This easy access to graphics offers me great potential; potential to either add value to instruction or depress learning. To add value you need to select the appropriate visual to support the psychological learning process and your instructional goals.

Graphics for Learning is not about media. It's about the best use of visuals, whether you're dealing with print, video, or online. The book includes a graphic design model and one of the earliest determinations you make is "what is the medium"? Many of us are not using graphics effectively. We need to think about "what is my content, what is my instructional goal, who is my audience, what is the delivery medium and what is

the best graphic to use"? We explain how to do this in the book.

CLJ: What is your current research focus? What can we look forward to learning about from you?

Clark: I'm currently working with an Australian instructional psychologist, Dr. John Sweller. In the past 25 years he's developed cognitive load theory. What it boils down to is efficiency in learning. That means we can have two different lessons and we get the same amount of learning from each. But one is much more difficult to learn and requires more time to complete. So that's a low efficiency lesson. Or, you might have two lessons that are equally difficult, but you get much greater learning from one than the other.

Cognitive load theory is about the intersection of performance with mental effort that defines efficiency. A highly efficient instructional environment is one that gives you high performance with a minimal amount of learning stress or mental effort. The book summarizes research on instructional methods that minimize cognitive load in all media — paper, multimedia, and job aids. The book should be out in 2005.

For more information about Clark Training and Consulting products and services, visit www.Clarktraining.com

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