

Main, Diane: Multimedia Research Assignment #4

Visual Representations and Learning: the Role of Static and Animated Graphics

They say a picture is worth a thousand words. But what if the picture leaves you with memories that don't match up with what the material is trying to get you to learn or remember? Have you learned a thousand of the wrong words?

I have had a special interest in cognitive load theory ever since I first heard those three words together, earlier in the Masters program I am about to complete. It made total sense, and I felt like the poster child for cognitive load theory, even more so as deadlines from work, grad school, writing commitments, and family stuff loomed. Usually, I thought of cognitive load in the context of my brain trying to manage too many different tasks at one time, usually resulting in all of them suffering somewhat.

But research suggests that we can look more closely at very specific learning situations, and apply what we know about overloading the brain to circumstances such as the visuals that accompany text or other media in education settings. In most cases, there is more than one "right way" to arrive at an answer or solution. There is more than one "right way" to approach a concept or correctly learn something. Therefore, it makes sense that one would offer what the article calls "multiple representations" to accompany instruction. These representations can come in varied formats, including still images, animations, spreadsheets, graphs, charts, diagrams, and other visual items.

You'd be tempted to think that the more ways to show something, the better the learning experience. However, if these multiple representations are different enough in what they depict, the result may be more confusion than comprehension. There are three functions of "multiple external representations," and these are to complement, constrain, and construct. Complement, in this context, means to come alongside and support what is represented by the text or audio or whatever form the content delivery takes. Here, constrain refers to limiting one's interpretations or possible misinterpretations of the accompanying media to only those things that are relevant. Construct, finally, is creating a deeper understanding or new (to the learner) meanings, as long as they fit in with the intended message being conveyed.

If selection of visuals has been carried out very carefully, these three functions will naturally take place. We're drawn to visuals to help us make sense of the rest of the information presented. Therefore, it's not difficult to see how perilous any distracting or extraneous visuals can be to a successful learning outcome. So the question – when designing instructional materials that include visuals – has to become: why am I including this? Does it complement the rest of what is being presented? Is there any way that my learner might see these visuals as conflicting in their meaning or purpose? Is this necessary, and does it add meaning in the way I intend?

This brings the discussion back around then, in my mind at least, to Death by PowerPoint. Charts and graphs that I can't read on a slide, interspersed with far too much

text accompanied by seemingly random cutesy clip art, isn't just annoying and counter-productive, it's downright destructive to my thinking process as your audience. If your learners or presentation audience ever find themselves asking, "Was that frog important? Why was the frog there? What does that frog mean? Am I going to need to know that later? Is there a trick whereby the speaker will later ask me what kind of animal was on slide three?" then you, my presenter friend, are in trouble. No one in the room will hear much of what you say. They'll all be processing their feelings about amphibians.

Anglin, G.J., Vaez, H., and Cunningham, K.J. (2004). Visual representations and learning: the role of static and animated graphics. In D. Jonassen, (Ed.), *Handbook of research on educational communications and technology* (2nd ed., pp. 865-916). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.