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The Science of PowerPoint Overload

By Cliff Atkinson

The PowerPoint landscape has changed with the research of Richard E. Mayer of the University of California, Santa Barbara.

Rich's work is not about PowerPoint. It is about the way the human mind works. And with that core understanding, his research questions explore the best ways to present information that align with the mind's processing capability and capacity. Because of the way he approaches his research, his findings apply to a range of multimedia, including PowerPoint.

What does this mean for PowerPoint users? It is time for the sacred cows of PowerPoint to be sacrificed on the altar of scientific research.

For example, it is conventional wisdom to put no more than five lines of text on a slide, with no more than six words per line. But that convention is no longer wise in the light of research that shows that putting so much text on a slide is a recipe for information overload. As Rich said in a recent [interview](#) at Sociable Media:

"Cognitive scientists have discovered three important features of the human information processing system that are particularly relevant for PowerPoint users: *dual-channels*, that is, people have separate information processing channels for visual material and verbal material; *limited capacity*, that is, people can pay attention to only a few pieces of information in each channel at a time; and *active processing*, that is, people understand the presented material when they pay attention to the relevant material, organize it into a coherent mental structure, and integrate it with their prior knowledge."

In this light, a screen full of bullet points overloads the visual channel beyond its capacity, leaving little time for integration can happen.

A solution? Reduce visual overload by moving text off-screen, and shift processing to the auditory channel by narrating the content instead. A practical solution in PowerPoint is to design a "slide" in the Notes Page view, placing written explanation in the off-screen Notes section below, and using the on-screen area above for an illustration and a few descriptive words. This solution offers a better projected media experience, plus more comprehensive handouts when the PowerPoint is printed in Notes Page format. More work for you? Yes. A better learning experience for your audience? Yes. The reality is that we have to work harder to make PowerPoint easier for people to understand.

Rich's research marks a PowerPoint turning point. The science is there, and now it is up to us to deny it or accept it and change. If we decide to change, the change needs to happen in our own minds and behavior. Why do we put all those bullet points up there anyway? For some people it is to help them structure their thoughts, and to remind themselves of what they want to say. For others, it is to cover themselves by providing a record that they told somebody something: "See, it's there in the PowerPoint." But in any case, none of these reasons address the issue of the proper form the information needs to take for someone to process it effectively. And that is what we all need to learn how to do.

You can read more about Rich's research in his book [Multimedia Learning](#), or in his paper with Roxana Moreno of the University of New Mexico in [Educational Psychologist](#) titled ["Nine Ways to Reduce Cognitive Load in Multimedia Learning."](#) If you're short on time, here's a "Cliff's Notes" version of some of Rich's research-based design principles as they apply to PowerPoint:

Do your slides contain only words? Show some pictures.
Do your slides contain words that you also speak? Stop being redundant.
Do your slides contain things you don't explain? Get rid of them.
Do you pause for a long time on a single slide? Break it up into smaller pieces.
Do you have lots of information on a slide? Keep it simple.

Stay tuned to Sociable Media for a growing body of resources that can help you align your own PowerPoint with the cognitive processing capability and capacity of your and your audience's mind.

Cliff Atkinson is an independent management consultant specializing in organizational issues related to PowerPoint. You can visit his website at www.sociablemedia.com, read more articles [here](#), or contact him at cliff.atkinson@sociablemedia.com.

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