

Evil Technology: Nature or Nurture

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Technology in the classroom is nothing new. Neither is resistance to it. I remember when overheads were “emerging” technology and chalkboard-only curmudgeons self-righteously declared them as evil. In a way, the curmudgeons were right. Chalkboards encouraged a productive pace, promoted flexibility, and allowed for on-the-fly adjustments—and they still do. In contrast, many who used overheads allowed them to dictate the pace and, to a degree, even the content of the lecture. Woe to the teacher using overheads if the projector bulb burned out or the slides somehow got out of sequence. Back in the day, I witnessed flustered teachers actually cancel classes if the projector was not functioning. I have seen usually calm teachers break into a flop-sweat when an overhead was missing or out of place. It was as if they had no idea what to do and all of their knowledge was on the slides.

Sound familiar? These and even more criticisms are leveled at today’s emerging classroom technologies, PowerPoint-type products, in particular. Now, it is the overhead curmudgeon self-righteously declaring the new technology evil. I am willing to wager that there was a time when chalkboards were considered the evil technology. I am also fairly confident that, although PowerPoint and its conceptual cousins are the current nemeses, other even more evil classroom technologies will emerge in my professional lifetime. Circle of life. To be fair, new technologies often bring more powerful tools to the teaching and learning processes. And along with dynamic new ways of presenting information comes previously unfathomable potential to bore, confuse, and oversimplify.

Whether discussions, lectures, or technology, pedagogical tools have one thing in common: their potential for nonstrategic implementation. Like a young child wearing his new superhero costume everywhere he goes, many who adopt new strategies tend to adopt them universally and overgeneralize their uses to clearly inappropriate contexts. PowerPoint is just the latest and most ubiquitous example.

In this essay, I hope to share a perspective based on my own mistakes and observations of dozens of faculty with whom I have been fortunate enough to work. Like many of my colleagues, I had elegant and rich PowerPoint presentations that took me hours to develop. However, I often had this nagging feeling that I had lost something. On the few days when the technology failed to work and I had to wing it, I was surprised at how well the classes went—in fact, so were my students. This made me wonder: Maybe I had let PowerPoint take over a bit too much.

I Read, Therefore They Learn

Visit some classrooms of faculty who habitually use PowerPoint. Most instructors use it in a very linear, text-heavy fashion. This often relegates students to the role of transcriber rather than

learner, leaving them little time to process the information in their haste to write down everything on the slides. You can tell students not to do it, but they will. It is an age-old fact of academic life: Students tend to write down what you write down. They did it with chalkboards, and they do it with PowerPoint. We complain more now because we are writing more now.

The question we have to ask these instructors is, “Why is there so much information on the slides to begin with?” This leads me to my main point: PowerPoint is a tool that should be aimed at making the student’s experience—not yours—qualitatively better. Too many instructors are using PowerPoint as their own lecture notes. They click, read (often turning their backs to the students), make a bit of eye contact on their pirouette back toward the computer, and go to the next slide. I had a colleague defend this practice. After a class visit, I pointed out that few students were listening to him. Moreover, many students felt that my colleague’s reading of the slides was interfering with their transcribing. He said, “That’s fine. Everything I want them to know is on the slides.” If everything you have to offer is written on PowerPoint, e-mail your students the slides and save everybody a trip to class! The habitual use of dense text effectively removes the instructor from the lecture. Remember, you should always be a focal point in the classroom, even if the lights are dimmed and you are standing off to the side.

If mere observation or empathy for your audience is not adequate to convince you to curb this practice, the literature on this topic is clear. Excessive text does not enhance student learning (Mayer, Heiser, & Lonn, 2001), especially when accompanied by redundant narration (Moreno & Mayer, 1999). PowerPoint is a visual medium and is not as effective as a live teacher at delivering words. Let’s be crystal clear here: Reading text is not an opportunity for visual learning (see Gardner, 1999, for clarification). Rather, pictures and other graphics paired with complimentary text promote dual encoding (Najjar, 1996; Paivio, 1986). There is ample evidence that a good lecture supported by appropriate visual representations can be more effective than lecture alone (Daniel & Kluetz, 2005; Mayer, 2001). Like overheads and diagrams on chalkboards before them, PowerPoint has expanded the type and variety of visual information we can use to compliment the lecture. In the right hands and when used at the right times, it can be a very powerful tool. In the wrong hands, it can be distracting and encourage an uncritical transcription of dense, later meaningless, text.

A good lecture is more than mere recitation of text; it is an interactive experience replete with examples, descriptions, ebbs, flows, detours, and numerous other almost mystical elements. A great lecture can generate enthusiasm and capture the imagination, and the inclusion of well thought-out and targeted PowerPoint slides can make the experience even more productive. Conversely, dense slides may divert attention from the lecturer and her message, chop up the big points into hard-to-integrate bullets, and replace deeper processing with furious, verbatim note-taking. Technology should be used to support the teacher, not take her place.

PowerPoint Doesn’t Have a Brain, So You Need to Use Your Own

PowerPoint is quite aptly termed “presentation software” rather than “teaching software.” Believe it or not, this simple distinction has had a tremendous and positive impact on my teaching. My goal as a teacher is not transcription, persuasion, or personal affirmation. In my view, effective teaching requires the strategic transmission of information in a manner that

affects a desired change in the student (e.g., learning, retention, reflection). Whereas we may expect our peers to have the requisite knowledge base and expertise to follow a presentation, teaching that same topic to the neophyte requires a level of structure and scaffolding that changes the very nature of the experience. In other words, there is more to teaching than simply presenting information. Different goals often require different strategies.

Few would argue that PowerPoint has content expertise when it comes to your subject matter. It is a program, and you supply the information. Yet many instructors rely on this same program to structure and dictate the flow of their lectures; these instructors end up replacing their personal teaching style with a click-and-recite style. Too many, especially newer, faculty are using this technology to develop, rather than support, their lectures. Allowing the structure of these programs, and not your own goals and methods, to become the primary guide for your lectures creates a very real risk of obscuring, rather than clarifying, important points. All classroom pedagogy, even electronic, is filtered through the instructor, and PowerPoint is a great example of this. If teachers do not assert themselves into the software, defining it as a teaching tool rather than a presentation template, the software will often dominate the presentation and may effectively remove the precise qualities that make a teacher important (Daniel, 2005).

PowerPoint does not have your experience, style, learning objectives, or knowledge of teaching. We must be ever mindful of the important ways we allow the format of technology to alter, and often dilute, the power of our messages. Therefore, teachers should have a pretty good idea of what they want to say and, more importantly, what they want students to learn before turning to PowerPoint. Write your lecture first, and then ask yourself what visual and auditory support, if any, would clarify, reinforce, or otherwise increase the student's ability to understand important content. Remember that you deliver the lecture; PowerPoint only plays a supporting role.

This is not to say that words have no place. Rather, they just need to be used strategically for emphasis and structure rather than content delivery. Particularly for less experienced or skilled students, single words or short phrases signaling the content of your narrative can serve as organizational aids for note-taking. In addition, longer definitions of important terms that you want them to know verbatim are excellent candidates to include on a slide. Just be careful not to show the definition until you have already introduced the term, or students will ignore you as they are transcribing. Remember, you, and not the technology, are in charge of the pace of the lecture. Make it show what you want, when you want.

Experiment and Evaluate

The use of technology for its own sake may be encouraged by certain administrators. However, we have a higher calling! We are charged with promoting meaningful change in our students. Sometimes, technology positively affects learning in my classroom; sometimes, it does not; and sometimes, there is a dosage effect, and I have to figure out where the costs outweigh the benefits. It is very important to note that not every teacher is the same: What works for one may fail miserably for another. What works for you, then, is a personally empirical question. Ultimately, what works results from the interaction of learner characteristics, learning objectives, course material, available tools, and teaching style.

Similarly, PowerPoint is not useful for every learning objective, student, context, or teacher. Once you cultivate your teaching style, define your goals, and learn the capabilities of the program, you will most likely use it less often. I view this as a sign of maturity. Balance comes from experience and reflection rather than solely from the literature or a damn fine essay. Similar to discussions, demonstrations, and other pedagogical strategies, the use of PowerPoint is good for some people, some contexts, some students, some learning objectives, some of the time. Like good teaching, the proper role of technology in your classroom is developed through trial and error.

The Nature of the Beast

As may be clear by now, I view technology as a tool that can be wielded in many ways—some good, some bad, and some flashy but ineffective. PowerPoint is not born evil, but it has potential. Therefore, I have included some general guidelines to consider as you experiment with the most effective use of PowerPoint in your classroom (Ludwig, Daniel, Froman & Mathie, in press). I have placed these below, rather than above, for obvious metaphorical reasons.

1. Avoid using the presentation as your lecture notes. A presentation is for the audience, and their learning is the primary objective. Write your lecture before opening the PowerPoint program, and use slides for information that is best presented visually. If you must, write your lecture in PowerPoint, print it, and then open it up as a new file, deleting everything that is just for you. Now you have lecture notes and a more effective presentation.
2. Minimize text. Narration is usually better than text for learning and retention in a classroom context. Clarity, not comprehensiveness, is your primary objective.
3. Minimize distractions. You should (a) select nondistracting backgrounds, (b) select easy-to-read fonts, (c) select smooth transitions, (d) use pictures only when directly relevant to your point, and (e) exclude irrelevant animations or sounds.
4. Be strategic. A good picture is worth a thousand words; a bad one needs explanation. Choose pictures, graphs, and videos that clearly demonstrate the point you want to make.
5. Finally, save room for dessert. Leave room for flexibility, questions, and the occasional tangent.

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