

**Make Them See:
Designing Effective
Software-Based Presentations**

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Abstract

PowerPoint software is virtually ubiquitous in business, government, and education. Unfortunately, many *PowerPoint* presentations are poorly designed and tedious. To understand and possibly overcome these shortcomings, this paper considers the cognitive and metaphoric foundations of *PowerPoint* through an extended examination of views, positive and negative, regarding the software's merits. The paper concludes with an annotated list of helpful resources for users of presentation software, along with some basic guidelines for effective slide-based presentations.

“Make Them See” the Old-Fashioned Way

We live in a visual age in which images dominate nearly all media. During the past century, written and oral modes of discourse have steadily lost ground to visual ones. Presentation software, notably *PowerPoint*, is both a result and a further cause of this historical trend in which visual media complement the traditional printed word and the spoken word—and compete with them for dominance.

Unfortunately, *PowerPoint* is often clumsily used. We have all seen *PowerPoint* slides crammed with so much text that no one can digest the information. On the other extreme, we have often seen slides with ideas so truncated that clear analytical thinking fails to develop. Frequently, too, we have sat patiently in the audience and listened to speakers labor through their slides by reading them aloud one by one as a substitute for giving a real presentation.

Slides do not have to be misused in these ways. Designed with intelligence and care, a slide-based presentation should satisfy the audience's needs for information and understanding in ways that make sense logically and visually—that is, in ways that make the audience “see” the speaker's main ideas.

“My task which I am trying to achieve is, by the power of the written word, to make you hear, to make you feel—it is, before all, to make you *see*. That—and no more, and it is everything” (Conrad, 1897, 1987, p. xlix). The novelist Joseph Conrad expressed this view over a century ago: For the literary writer, then and now, the chief goal is to use the written word to make the reader “see” the author’s vision of life. In the hands of a great artist like Conrad or Shakespeare, the written word, crafted into striking imagery and jeweled phrases, stimulates the imagination and makes us “see” many truths about life arising from the mutual involvement of characters. Similarly, from a great orator like Abraham Lincoln—one who actually wrote the words that he delivered—many of the same literary techniques can elevate political discourse into statesmanlike eloquence, telling the truth about the nature of government in human affairs.

***PowerPoint*: “Through a Glass, Darkly”?**

It is safe to say that neither the writers of this article nor most of its readers will ever rise to the levels of language attained by the authors just mentioned. Nor do we need to. Our aims are much more modest than those of literary and historical giants. We, along with our students, have our own ideas to express in our classrooms and, occasionally, at academic conferences. The question to be considered here, however, has significant implications: Does *PowerPoint* help us or hinder us in expressing our ideas and making our audiences see them?

It is painful to imagine the words of Conrad, Shakespeare, or Lincoln somehow reduced to bullet lists in *PowerPoint* slides, for the results would surely be bizarre and grotesque, and, inevitably, an utter distortion of the original. To make this very point, Peter Norvig, a distinguished computer scientist, created and posted online a parody version of a typical *PowerPoint* presentation, grinding Lincoln’s “Gettysburg Address” through the software’s automated “labor-saving” AutoContent Wizard to produce a monstrosity utterly devoid of the grace, clarity, and grandeur of the original text (Norvig, 2000). (Lincoln’s own words are appended in Norvig, 2003a.)

Norvig (2003b) explains that he wrote this parody out of sheer exasperation with the tendencies of *PowerPoint* to reduce clarity of thought and to hamper interaction between speaker and audience. Norvig imagines himself thinking as he sits through a typical *PowerPoint* presentation:

*Doesn’t he realize this presentation is a waste of time? Why doesn’t he just tell us what matters and get it over with? How many times have you heard (or muttered) that? How many of us have been frustrated at seeing too many presentations where *PowerPoint* or other visual aids obscure rather than enhance the point? After one too many bad presentations at a meeting in January 2000, I decided to see if I could *do* something about it (§s 1-2).*

To this end, Norvig (2003b) found the AutoContent Wizard exceedingly helpful in carrying out his intention of “adding bad design wherever possible” (§ 3). As Norvig argues, and as other subsequently-cited critics attest, many presenters lose their focus

and the thread of their thoughts in *PowerPoint*'s automated formats, those supposedly "user-friendly" features which effectively dictate choices to users rather than provide options, or simple freedom, for creative expression.

What Opposing Experts "See" in *PowerPoint*

For millions of users, *PowerPoint* is the presentation software of choice—or, more exactly, of no choice—because Microsoft long ago crushed any viable competition. (A notable exception is Apple's *Keynote* for the Macintosh platform only.) Most users of *PowerPoint* accept it uncritically, while some, including the current writers, find its recent "Presenter Tools" mode to be surprisingly user-friendly. Others, mostly critics of technology, are deeply skeptical about the impact of *PowerPoint* on education, culture, and human cognition. Untangling these various strands of favorable and unfavorable views may put *PowerPoint* in perspective and might lead to a better understanding of its proper uses.

PowerPoint seems ubiquitous today, from business meeting rooms, to university lecture halls and academic conferences, to high school and even elementary school classrooms. (Churches, too, are not spared in the software's pervasiveness.) The users of *PowerPoint* number literally in the hundreds of millions, and many of them believe that the software's automated structures for generating slide appearance and content save them time and energy, while, simultaneously, reducing their presentation anxiety. Parker (2001), writing in *The New Yorker*, explains this appeal by describing the software as "an impressive antidote to fear—converting public-speaking dread into movie-making pleasure" (p. 78). Labor-saving ease of use and relief from stress have long been winning marketing slogans for products that range from household appliances to pharmaceuticals. It was simply a matter of time before the combination would be extended to software.

Moreover, praise for *PowerPoint* comes from some distinguished places in academia. Steven Pinker, author of *The Language Instinct* and a psychology professor at the Massachusetts Institute of Technology, praises *PowerPoint* for the ways it can give visual shape to an argument: "Language is a linear medium: one damn word after another," he says. "But ideas are multi-dimensional. . . . When properly employed, *PowerPoint* makes the logical structure of an argument more transparent. Two channels sending the same information are better than one" (Parker, 2001, p. 86). Farther up the Charles River, at Harvard University, one can find another *PowerPoint* enthusiast: Howard Gardner, the renowned developmental psychologist and pioneer of Multiple Intelligences theory. As Keller (2003) observes in the *Chicago Tribune*, one might expect Gardner to be more skeptical of *PowerPoint*, especially in regard to the way that it has invaded the public schools, "where rote use of the software might channel kids' minds into preordained pathways." Unhappily, Keller laments, Gardner is "a *PowerPoint* man to the bone," uses it regularly in his lectures, and argues that it might well stimulate rather than inhibit creativity "if the technology is used imaginatively and synergistically with other paraphernalia" (Keller, 2003, ¶s 61-62).

Another academic, Clifford Nass, a communications professor at Stanford University, offers a more mixed assessment. According to Parker (2001), Nass acknowledges that *PowerPoint* is widespread on his campus and that students seem to

expect it in lecture classes. He says that *PowerPoint* “lifts the floor” of public speaking, as “a lecture is less likely to be poor if the speaker is using the program.” Nass praises *PowerPoint* for its efficient ability to deliver content: “What the students gain is a lot more information—not just the facts but rules, ways of thinking, examples.” Nass tempers his praise, however, with an admission that *PowerPoint* also “lowers the ceiling.” It reduces interaction between teachers and students, and it inhibits the sudden bursts of inspiration and improvisation that Nass recalls as features of some of his best lessons before he started giving software-based lectures (Parker, 2001, p. 87).

A substantial number of other thoughtful critics, however, consider *PowerPoint* to be highly problematic, even dangerous. While some see the software’s features as clumsy or annoying, others find a more ominous quality in the way that *PowerPoint* insinuates itself into the minds of users and audiences. Parker (2001), for example, claims that *PowerPoint* is “software you impose on other people” by projecting it on a screen, printing it out, and then, for a third treatment, as it were, reading it word-for-word to an audience. The operating metaphor for most software is a set of tools, but Parker discerns something else: “*PowerPoint* is more like a suit of clothes, or a car, or plastic surgery. You take it out with you. You are judged by it—you insist on being judged by it. It is by definition a social instrument, turning middle managers into bullet-point dandies.” Even more perniciously, however, *PowerPoint* alters the thinking processes of those who use it: “It edits ideas. It is, almost surreptitiously, a business manual as well as a business suit, with an opinion—an oddly pedantic, prescriptive opinion—about the way we should think. It helps you make a case, but it also makes its own case: about how to organize information, how much information to organize, how to look at the world” (Parker, 2001, p. 76). In all this, one can hear echoes of the often-quoted admonition of Thoreau (1854, p. 352) that “men have become the tools of their tools.” As a post-industrial tool, *PowerPoint* seems capable of infiltrating the very minds of its users.

Indeed, the specter of “brainwashing” arises in much of the heavier criticism of *PowerPoint*. Keller (2003) notes, “Eerily, *PowerPoint* was invented in 1984, that iconic year of Orwellian mind control” (§ 19). From its relatively modest beginnings, within a few years the software was acquired by Microsoft, where it grew exponentially with the proliferation of Microsoft’s bundled software, until now *PowerPoint* commands ninety-five percent of the presentation software market, with an estimated three hundred million users worldwide (Keller, 2003, §§ 21-22). With no effort at understatement, Keller describes *PowerPoint* as “poised for world domination,” and likens it to “technological cocaine—so effortless to embrace initially, so difficult to relinquish after that. People who once use *PowerPoint* generally don’t stop using it” (§§ 21-22). The comparison of *PowerPoint* to an addictive drug and, by implication, of Microsoft to a drug cartel might seem a bit heavy-handed, were it not for the phenomenal growth of the market for this software and Microsoft’s notoriously aggressive marketing strategies.

Clearly, Keller is troubled by the technological imperative that drives people in education and business to embrace *PowerPoint* uncritically and then gives them license to question the judgment of anyone who does not share their views. Keller cites two distinguished American social critics whose opinions buttress her own skepticism. One of them, Mumford (1970, pp. 185-186), warned against

“technological compulsiveness” long before personal computers became common items in the workplace and the home. The other, Postman (1985), insists that “technology is ideology.” Postman continues with his jeremiad: “To be unaware that a technology comes equipped with a program for social change, to maintain that technology is neutral, to make the assumption that technology is always a friend to culture is, at this late hour, stupidly plain and simple” (cited in Keller, 2003, 71). Echoing this litany, the ghosts of Thoreau and Orwell also bid to speak. *PowerPoint* fits into a long chain of events in the evolution of technology, not all of which can be considered healthy.

Keller fears that the impact of *PowerPoint* is decidedly unfriendly, particularly to the culture of the schools. She asks, rather plaintively, “What sort of world is reflected in *PowerPoint*? A world stripped down to briefly summarized essences, a world snipped clean of the annoying underbrush of ambiguity and complication. But is that the world in which we want to live? And are the values prized by businesses—succinctness, directness, manipulation of symbols—also the values we want running our schools and nurturing our children?” (Keller, 2003, 72). Keller mourns the loss of independent intellectual curiosity and lucid thinking that used to characterize what was best in education before the arrival of digital “instructional technology.” Her attitudes are shared by others who view with concern the growing influence of business over school and university curricula, with the attendant dangers to the academic freedom of teachers and students alike.

As if these indictments were not enough, some of the most cogent criticism of *PowerPoint* comes from Edward Tufte, Yale professor emeritus of design, whose three major works, (1990), (1997) and (2001), are recognized as classics in the field of the visual display of information. Tufte (2003) criticizes what he calls “the cognitive style of *PowerPoint*” which shuts down any kind of interplay between speaker and audience because the software is “entirely presenter-oriented, and not content-oriented, not audience-oriented.” He notes wryly that “the fans of *PowerPoint* are presenters, rarely audience members” (p. 4). The convenience for the speaker, however, carries a very high price in “*the cognitive style characteristic of the standard default [PowerPoint] presentation*”:

foreshortening of evidence and thought, low spatial resolution, a deeply hierarchical single-path structure as the model for organizing every type of content, breaking up narrative and data into slides and minimal fragments, rapid temporal sequencing of thin information rather than focused spatial analysis, conspicuous decoration and Phluff, a preoccupation with format not content, an attitude of commercialism that turns everything into a sales pitch (Tufte, 2003, p. 4).

In effect, the “cognitive style” of *PowerPoint* numbs rather than enlightens audiences by offering speakers a tempting array of tools for producing razzle-dazzle special effects at the expense of content. “Phluff,” a white sugary whipped marshmallow-like dessert topping filled with empty calories, is used by Tufte to characterize the redundant tools and the inane triviality of the many structural and decorative features of *PowerPoint*: “chartjunk, over-produced layouts, cheerleader logotypes and branding, and corny clip art” (2003, p. 4).

Tufte argues that the very structure of *PowerPoint* forces presenters into compromises with the complexities of both their subject and the truth. With extremely low resolution, each slide has little room for information, leading to “overgeneralizations, imprecise statements, slogans, lightweight evidence, abrupt and thinly-argued claims.” Tufte (2003) continues:

With so little information per slide, many slides are needed. Audiences consequently endure a relentless sequentiality, one damn slide after another. When information is stacked in time, it is difficult to understand context and evaluate relationships. Visual reasoning usually works more effectively when the relevant information is shown adjacent in space within our eyespan (p. 4).

The limitations of space and time are compounded by other shortcomings in the format of *PowerPoint*. Tufte asserts:

Sometimes *PowerPoint*'s low resolution is said to promote a clarity of reading and thinking. Yet in visual reasoning, art, typography, cartography, even sculpture, the quantity of detail is an issue completely separate from the difficulty of reading. Indeed, at times, the more intense the detail, the greater the clarity and understanding—because meaning and reasoning are contextual. Less is a bore (2003, p. 12).

By contrast, a simple A-4-sized handout usually contains more information than half a dozen *PowerPoint* slides, and the information is easier to assimilate on paper because it is all together in a way that can quickly and easily be taken in visually.

A related problem common to many *PowerPoint* presentations is “poverty of content.” Tufte examines the roots of this poverty:

First, *the PP design style*, which typically uses only about 30% to 40% of the space available on a slide to show unique content, with all remaining space devoted to Phluff, bullets, frames, and branding. Second, *the slide projection of text*, which requires very large type so the audience can read the words. Third, *presenters who don't have all that much to say*. . . .” (2003, p. 12).

Indeed, the general poverty of content in many *PowerPoint* presentations gives rise to Tufte's serious reservations—much like Keller's, as noted earlier—about the growing influence of the cognitive style of *PowerPoint* in the schools. Tufte observes ruefully, “Instead of writing a report using sentences, children learn how to make client pitches and info-mercials.” He notes that elementary students' projects typically show “10 to 20 words and some clip art on each slide in a presentation consisting of 3 to 6 slides—a total of perhaps 80 words (15 seconds of silent reading) for a week of work” (2003, p. 13). Unable to conceal his indignation over the intellectual shortchanging of schoolchildren, Tufte fumes:

Rather than being trained as mini-bureaucrats in [*PowerPoint*] Phluff and foreshortening of thought, students would be better off if the schools

simply closed down on those days and everyone went to The Exploratorium. Or wrote an illustrated essay explaining something (2003, p. 13).

In Tufte's assertions of why it is wrong to impose the agenda and the cognitive style of the business world on education, one hears again the warnings of Mumford (1970) against "technological compulsiveness" and of Thoreau (1854, 1985) against becoming "the tools of [our] tools."

A third problem that arises from *PowerPoint* has to do with one of its defining features, its structural reliance on "bullet lists" of brief phrases. While these lists may create "the appearance of hard-headed organized thought," they often encourage intellectual laziness. Tufte cites a *Harvard Business Review* study that concludes that bullet lists are "typically too generic," "leave critical relationships unspecified," and "leave critical assumptions . . . unstated" (Tufte, 2003, pp. 5-6). Moreover, when single slides are crammed with too many subordinated ideas in a descending hierarchy of bullets, dashes, and diamonds, audiences may become even more bewildered than when too few ideas appear in a long succession of slides.

Ultimately, the problem with bullets, Tufte argues, is their metaphoric nature which is grounded in authoritarianism. Long before presentation software was developed, presenters in the military and at large corporations like IBM displayed bullet lists on overhead projectors. When Microsoft acquired and then marketed the software that eventually became *PowerPoint*, the metaphor behind its "cognitive style" proved to be "*the software corporation itself*." Tufte explicates this metaphor:

That is, a big bureaucracy engaged in *computer programming* (deeply hierarchical, nested, highly structured, relentlessly sequential, one-short-line-at-a-time) and in *marketing* (fast pace, misdirection, advocacy not analysis, slogan thinking, branding, exaggerated claims, marketplace ethics). *To describe a software house is to describe the PowerPoint cognitive style* (Tufte, 2003, p. 13).

To recast a phrase from the world of the software house itself, in not very flattering terms, the spirit and the substance of *PowerPoint* can be summarized as "software-house thinking in, software-house thinking out."

Having identified the metaphors on which *PowerPoint* rests, Tufte asks, "Why should the structure, activities, and values of a large commercial bureaucracy be a useful metaphor for our presentations? Could any metaphor be worse? Voice-mail menu systems? Billboards? Television? Stalin?" (2003, p. 13). Implying that the murderous dictator might have appreciated one of *PowerPoint's* central metaphors, Tufte asserts, "There's NO bullet list like Stalin's bullet list" (2003, p. 25). The authoritarian nature of *PowerPoint*, then, comes down to this:

The pushy PP style imposes itself on the audience and, at times, seeks to set up a dominance relationship between speaker and audience. The speaker, after all, is making *power points with bullets to followers*. Such aggressive, stereotyped, over-managed presentations—the Great Leader

up on the pedestal—are characteristic of hegemonic systems (Tufte, 2003, p. 13).

Provocatively, Tufte (2003, p. 13) compares the authoritarian theatrics of *PowerPoint* to the circuses and amphitheaters of the Roman Empire (and, by implication, to the torch-lit ceremonies of Nazi Germany), which were intended to simultaneously engage and manipulate the masses while dwarfing the individual. Like Keller, whose grave doubts about *PowerPoint* were considered earlier, Tufte is left wondering why anything based on metaphors so hostile to human freedom and dignity should ever be imposed upon school children who cannot defend themselves. After all, it is bad enough that the same mind-numbing metaphors are imposed upon millions of adults in the working world.

Seeing “Through a Glass, Brightly”?

In the shadows cast by these somber ruminations on the curious nature, the ominous social impact, and the cognitive perils of *PowerPoint*, it might seem impossible to reconcile the differences between those who embrace the software and others who revile it. Like it or not, however, *PowerPoint* is inescapably part of the current state of personal computing and its likely future, and education is not exempt. Teaching our charges how to use this ubiquitous software becomes an unavoidable task of teachers who want students to become more effective presenters.

Making the audience “see” the content and the significance of one’s message is the goal of any serious presenter. It gladdens speakers, and their teachers, to hear the barely audible “Ah ha!” and imagine the light bulbs of understanding—possibly even enlightenment—flashing over the audience members’ heads when a presentation goes well. In this spirit, perhaps, we may learn how to use *PowerPoint* responsibly, or at least in ways that do no harm. Tufte himself suggests that “a better metaphor for presentation is *good teaching*.” As he elaborates, “Teachers seek to explain something with credibility, which is what many presentations are trying to do. The core ideas of teaching—*explanation, reasoning, finding things out, questioning, content, evidence, credible authority not patronizing authoritarianism*—are contrary to the hierarchical market-pitch approach” (Tufte, 2003, p. 13).

It is easy to agree with Tufte on this subject, at least if one is not part of the military-intelligence-industrial complex and much of the rest of the corporate world. The dominant metaphor of a good presentation and the software that supports it should properly be “teaching and learning”: not sloganeering or marketing, but an honest search for truth in the best academic tradition. Such values, were they to wash back to the business world, might have beneficial effects. Of course, in the healthiest centers of business, such values already exist—because business, like education, is a learning enterprise, as it were, in which the members learn from experience, so as to survive and prosper (Gardner, 1999, pp. 190-191). In the most constructive contexts, the gap between the values of business and the values of education may not be that great, after all.

Guided by Tufte’s metaphor of “good teaching,” the writers of this article have spent several years developing presentation classes for undergraduates at a technical university in central Japan, culminating in a textbook, Dryden (2004).

PowerPoint is introduced in mid-course as a tool supporting other templates and scaffolds for thought and language that students use when giving their presentations. Students work in *PowerPoint* not at the beginning of the process of composition but only after the main text of the speech is already written. Ideally, students take advantage of *PowerPoint* as a supplemental tool for explaining their ideas to an audience. Students are encouraged to ignore the AutoContent Wizard and to use *PowerPoint* sparingly and for specific purposes: as a support for their arguments, as mnemonics for themselves when speaking, and as clear visual aids for the audience.

Before concluding, the authors wish to express their perplexity over virtually every *PowerPoint* presentation they have attended at academic conferences. From distinguished plenary speakers on down, we find nearly everyone's *PowerPoint* slides crammed with excessive words, lacking a clear subordination of ideas, visually confused and inelegant. One of the simplest tests of visual competence, which most speakers fail, involves limiting each unit of thought to a single line of text. Invariably, there are too many words, and a typical line spills onto the next line, with one or more words floating away meaninglessly from the original unit of thought (*Figure 1*). Such visual carelessness violates the basic principle of "proximity" which Williams (1994) states simply: "Group related items together" (p. 15). Lapses from this principle, both linguistic and visual, can be corrected by following the directive of Strunk and White (1959, 2000): "Omit needless words" (pp. 23-24). The dictum is so pithy that it still bears repeating (*Figure 2*). Related errors of repetition can be dealt with similarly (*Figures 3, 4*).



Figure 1: Common Errors



Figure 2: Alignment / Omission

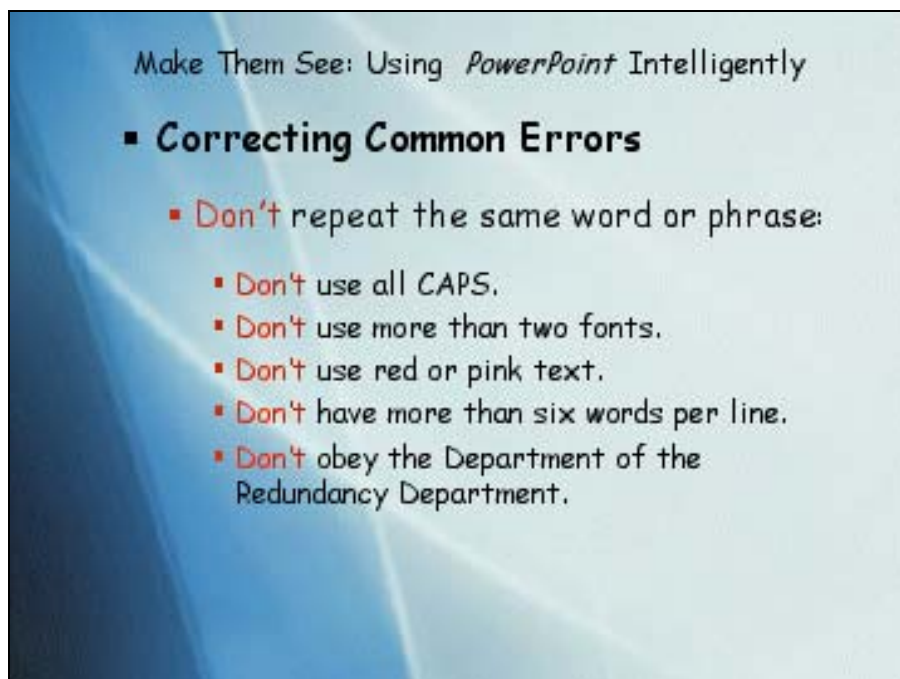


Figure 3: Don'ts

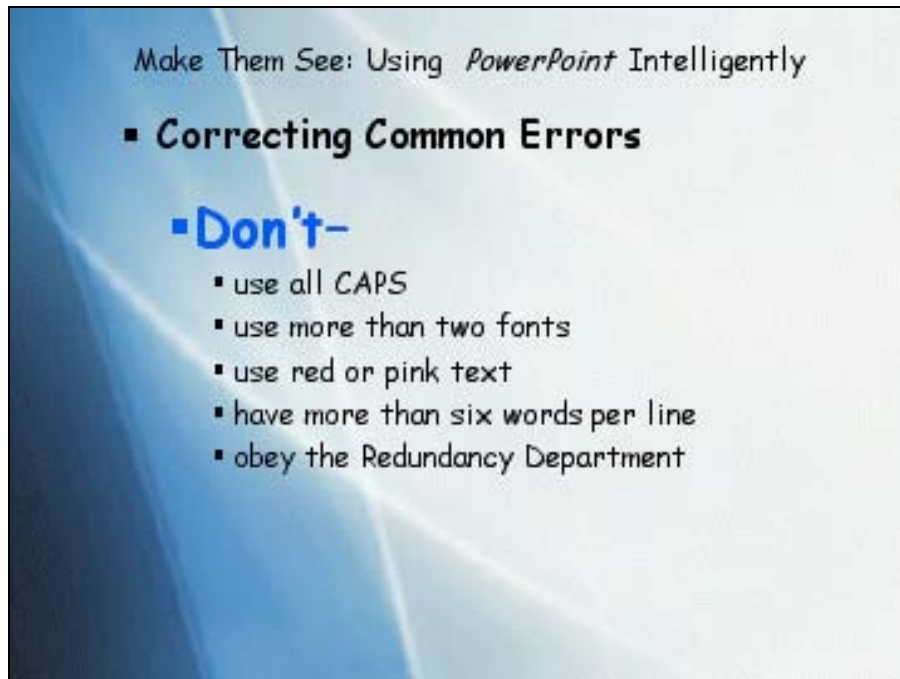


Figure 4: Additional Don'ts

In addition to Strunk and White, many guidebooks for presentation software are sympathetic to—if not always perfectly consistent with—Tufte’s principles in their advice for the design of individual slides and entire presentations. Wilder and Rotondo (2002) provides good models of ways to reduce visual clutter. This volume derives from earlier works, Rotondo (2001) and Lawson (1997), although the latter may be difficult to retrieve. Atkinson (2005) applies Strunk and White’s philosophy that “less is more” to slide and presentation design, primarily for Windows users. Evidently sanctioned by Microsoft, Atkinson recommends storyboarding and the metaphors of theater and film—certainly much friendlier formats than bullets. Most of Atkinson’s insights, however, were developed earlier and perhaps more effectively by Negrino (2003) and Holsinger (2003), both of which, not surprisingly, were written for *Keynote*, Apple’s presentation software for Macintosh. Negrino (2004), however, deals entirely with *PowerPoint*. For more general guidelines on good design principles, we highly recommend Williams (1994) and (1998), Cohen and Williams (1999), and Williams and Tollett (2001). Williams remains for many the source of all knowledge regarding the principles of effective design and the elegant arrangement of words and images in computer-based projects. Anything from Williams’ publisher, Peachpit Press, is likely to yield valuable insights into sound design principles.

Conclusion

Users of *PowerPoint*, including teachers and students who use the software for classroom projects, face many constraints. *PowerPoint* rests on metaphors of power relations that divide the speaker from the audience and subvert the speaker's independent thinking: Its many special effects can easily distract the audience rather support understanding. In the course of discussing these matters, several principles and strategies for the design of good presentations have been considered. These can be summarized briefly:

I. Content:

1. Tell what matters most. Don't bore the audience.
2. Ignore the "AutoContent Wizard." Don't be the tool of your tools.
3. Make good teaching and learning your guiding principles.
4. Avoid sloganeering, facile marketing, and exaggerated claims.

II. Form:

1. Combine words and images to make the audience "see" your message.
2. Don't use distracting "bells and whistles."
3. Omit needless words.
4. Keep units of thought together on a single line.
5. Avoid lists of bullets, dashes, and diamonds.
6. Observe the "Rule of Six": (Six words to a line, six lines on a slide.)
7. Break the Rule of Six, and other rules, if you have a good reason.

III. Delivery:

1. Be the classic "good person speaking well."
2. Teach, guide, and respect the audience. Don't overwhelm them.
3. Don't read your slides word for word. (Don't bore the audience.)
4. Use slides as mnemonics for your spontaneous speech.
5. Try to move around the room rather than stay behind the lectern.

Certainly, these are not the only guidelines, and there will be times when some of them are impossible to follow. Nevertheless, when used effectively, such guidelines will help speakers make the audience "see" their purpose, their message, and their vision.

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