

PowerPoint: Know Your Medium

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To make the most of PowerPoint in professional presentations, presenters need to understand some basic principles that transcend the software. These include a thorough grasp of the message a presenter wants to convey; the backgrounds, interests, and needs of the audience; and the best approaches to fitting the medium of delivery to the content of the material. PowerPoint is a useful tool, but like any tool, whether a stethoscope, a scalpel, or a CT scanner, it can be used well or ill. Using it to its full capabilities requires that we regard it less as a crutch that can compensate for our deficiencies and more as a springboard with which to vault our presentations higher. At its best, PowerPoint can serve us just as brushes and pigments serve an artist, but it can never substitute for a fertile imagination and a discerning eye.

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The medium is the message.

—Marshall McLuhan [1]

When Canadian media critic Marshall McLuhan [1] declared that the medium is the message, he meant that the prevalent communication media of our time shape the ways in which we perceive, think, and act in the world more powerfully than their content. One medium of professional communication that has just celebrated its 25th anniversary is PowerPoint, a presentation program originally developed in 1984 by programmers at ForeThought, Inc (Sunnyvale, California), a firm acquired in 1987 by Microsoft Corporation (Redmond, Washington). PowerPoint has been refined and expanded many times and has now become ubiquitous in many spheres of life, including classrooms and professional meetings. To make the most of PowerPoint, radiologists need to understand its advantages and disadvantages, including the ways it tends to shape content presented through it. In this article, we provide just such a review, with the intention of enabling both presenters and learners to avoid its pitfalls and take full advantage of its strengths.

ADVANTAGES

As anyone who remembers the days of 35-mm emulsion photographic slides can readily attest that the time and expense required to produce high-quality presentation slides is substantially reduced with PowerPoint. At one time, many larger radiology departments employed secretaries, photographers, and visual media specialists to help faculty members prepare presentations for local teaching and professional meetings [2]. These days, many faculty members are able to prepare their presentations without additional assistance. Moreover, such capabilities are now within the reach not only of faculty members but also of residents, medical students, and nearly everyone who can afford basic office software. It equalizes the playing field between senior and junior levels of a radiology department and may even provide an advantage to more junior people, who are likely to be more facile with such technologies.

A second advantage is improved quality of the images. PowerPoint's digital technology makes it possible to adjust a number of image parameters, including brightness, contrast, hue, saturation, resolution, and dimensions [3]. Such capabilities are especially important to an image-based specialty such as radiology. Of course, the ability to share such changes with an audience at a meeting is contingent on the availability of appropriate projectors. Fortunately, digital projectors have been improving in quality and dropping in size and price, making it possible to present images to audiences in high fidelity [2,3]. Such capabilities are especially important at a time when clinical imaging has become increasingly digital. PowerPoint also makes it relatively easy to digitally enhance and annotate images [3].

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Another advantage of PowerPoint is the ability to update files quickly and easily. In days gone by, presenters may have been reticent about producing new versions of their presentations because of the time and expense involved. As a result, some presenters would continue to use the same presentations for years, even though they would have benefited from updates and revisions [3]. Now lectures can be updated in minutes, without the necessity of waiting days or weeks to obtain new slides. Furthermore, preparations can be edited right up to the time they are presented, enabling faculty members to make revisions as warranted by other presentations they may have attended. It is also easier and less expensive to edit slides, making it possible to continually adapt and improve presentations over time, even while in transit.

PowerPoint has also made presentations more portable [3,4]. In the old days, presenters who lost their 35-mm slides were in trouble because backup copies were not available or, if they were, would take days to access. Moreover, sheets of 35-mm slides and slide carousels were often bulky and required time to load and unload. Now presentations can be transported on tiny, rewritable USB drives. Several presentations on slide carousels that might have required a separate piece of luggage now fit on a device the size of a thumb, and it is no more expensive or difficult to transport several hundred presentations as one. This increased portability also decreases the hazards of losing or misplacing a presentation. A presenter who loses one can often replace it by e-mail or using an Internet storage device at any time virtually anywhere in the world [3]. This enhanced portability also extends to dissemination, whereby the digital format enables presenters to make their work readily accessible via the Internet.

PowerPoint can also incorporate multiple forms of media. In days gone by, a presenter who wanted to share an audio or video clip would need an entirely different piece of equipment, such as an audiotape or videotape player [3,5]. Moreover, it would be necessary to coordinate different media during a presentation, which often produced embarrassing gaps and glitches. Now, audio and video clips can be incorporated seamlessly into the same file, in such a way that audiences experience no delay [3,5]. This has the potential to enrich the educational experience by enabling learners to see real-life examples of patient interactions and procedures that otherwise they could only conjure up in their imaginations.

Another advantage of PowerPoint is its user friendliness. Users do not require degrees or coursework in computer programming to become adept with it, and in fact many high school, middle school, and even elementary school students around the country acquire facility with the technology that exceeds that of some senior radiologists. Even novices can quickly begin using the software, and many

people learn to use it not through formal instruction but simply by beginning to build their own presentations. The resulting slides may not always be of the highest quality, but virtually anyone who uses a computer can with time learn to produce professional-looking slides and presentations that integrate images and text.

Slides themselves, whether digital or not, can offer important advantages. There is empirical evidence that such visual presentation technologies can increase learner motivation, attention, and even examination performance compared with more traditional transparencies or lectures in which no visual aids are used [4,6]. This principle holds particularly well in radiology, in which pictures are indeed "worth a thousand words," and no verbal description or even chalkboard drawing could ever convey the information in a single well-chosen radiologic image. Of course, presenters must be mindful to avoid the temptation to insert gratuitous visual effects and sound effects that have nothing to do with the material being presented, as they may merely distract learners and interfere with learning.

DISADVANTAGES

One disadvantage of PowerPoint is its tendency to reduce complex and sometimes beautiful ideas into brief phrases compatible with a bullet-point format. One of the best depictions of this tendency is a well-known rendition of one of the greatest political addresses in the history of the United States, Lincoln's Gettysburg Address, as a series of bulleted power points [7]. The result is laughable. In broader terms, PowerPoint has difficulty encompassing complex data sets and narratives, with the result that such ideas can be excessively simplified or simply even omitted [8,9]. Presenters must take care lest they allow the medium to control the message and thereby do both themselves and their audience a disservice. In some cases, discretion may be the better part of valor, and the most prudent course of action is to select another medium.

Another problem is the tendency for PowerPoint to encourage the use of acronyms and other abbreviations to make concepts fit on a slide, which in some cases can truncate learners' understanding [8,9]. Just because an idea is too complex to fit on a line or even on a whole slide does not mean presenters should feel themselves at liberty to chop it up or compress it to the point that it becomes incomprehensible. The information on a PowerPoint slide tends to be sparse, in part because the format typically uses only about 50% of the space for new information, with most of the rest consumed by graphics, bullets, frames, and so on [9]. This pitfall can be widened by the use of very large font sizes. For a presenter who has little to say, PowerPoint can provide useful cover, but for a

presenter who has a lot to say, PowerPoint can prove highly constraining.

PowerPoint also tends to foster a one-way transfer of information and linear thinking. Learners watching a PowerPoint presentation can quickly find themselves adopting the cognitive posture of passengers on a train, “just along for the ride,” and not playing any active part in organizing or responding to the information [9]. Moreover, every cognitive journey does not proceed from A to B to C to D, but PowerPoint promotes just such an expectation, thereby discouraging both presenters and learners from reexamining material that has already been covered and perceiving nonlinear connections between different ideas [8,9]. In effect, this tends to create a relationship of dominance between presenter and learner, undermining prospects for creative skepticism and dialogue between the two parties [9].

PowerPoint may also weaken the significance of lecture points. For example, the software encourages presenters to place numbered and bulleted points in hierarchies according to the indentation and size of the notation, but sometimes such categories may not reflect the intrinsic or relative importance of the ideas, and crucial information can get “lost in a sea of significance” [8]. The overall effect can be one of homogenizing information [8]. A dramatic testimony to the pitfall was provided by NASA’s Columbia Accident Investigation Board, which implicated PowerPoint as contributor to the loss of the space shuttle [8,9]. NASA engineers using PowerPoint to present to leaders inadvertently buried key information by placing it in the same context as less important information, leading to its underrepresentation in decision making [7,8].

Another pitfall with PowerPoint is its tendency to push other educational approaches out of the way. Its popularity can quickly make it the default format for presentations of all kinds [8]. As a result, presenters may neglect other educational technologies better suited for some situations. For example, in disciplines such as medical physics, it may be quite helpful for learners to have the opportunity to see an educator work through a problem in real time. In this situation, a chalk board or overhead projector may work better than PowerPoint. It would be a shame if presenters did not understand the range of alternatives on which they can draw and the various situations in which such alternatives would offer an educational advantage.

In some cases, the elements of a PowerPoint presentation may seem to convey logical values that are not valid. For example, putting a variety of items in a bulleted list may create the false impressions that the list is exhaustive, each item included has equal value, and the items themselves are mutually exclusive [9,10]. Listing items in a differential diagnosis may create the impression that only one disorder can be implicated, when in fact two condi-

tions could be present simultaneously. In other cases, the correct diagnosis may not be in the list at all. Presenters and learners need to regard such lists as deserving close scrutiny. If this is not done, weaknesses in arguments may go undetected, and defects in reasoning and resultant medical errors may be unwittingly promoted.

PowerPoint also carries its own set of technical limitations. For one thing, 35-mm slide projectors tended to be relatively homogenous in terms of display quality, but there is immense variability in resolution, platform, brightness, contrast, hue, and other characteristics of digital projection equipment [4]. In some cases, software incompatibilities between the systems on which presentations are produced and the systems on which they are displayed undermine their quality or even render them inoperable. In the extreme, a file may be simply inaccessible. The problem is compounded by the fact that many users lack the technological sophistication necessary to anticipate and cope with such incompatibilities [3,4].

CONCLUSION

In 2009, to celebrate the 25th anniversary of PowerPoint, BBC News *Magazine* asked its readers to recall their most memorable bad experiences with the software [11]. One reader recalled a 45-minute presentation in which the presenter stood with his back to the audience, reading and highlighting with a laser pointer every single word on each slide. Having been told that one of the advantages of PowerPoint is that you don’t need to be a brain surgeon to use it, the reader noted that this adage is not necessarily true because the PowerPoint user in question was in fact a neurosurgeon. This example highlights the fact that many PowerPoint presentations go wrong not because of PowerPoint itself but because of its misuse by incompetent presenters.

To make the most of PowerPoint in professional life, presenters need to grasp underlying principles that transcend the software [12]. These include the presenter’s intended message, the relevant characteristics of the audience, and the best means to effect a happy marriage between content and medium. PowerPoint is a powerful tool, but like any tool, it can be used well or ill. Instead of seeing it as an effort-sparing and embarrassment-sparing crutch, we need to regard it as a means of augmenting excellence. No technology, however sophisticated or ubiquitous, can substitute for a penetrating mind, a fertile imagination, and a discerning eye.

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