Opinion

On Improvement of Scientific Presentations: Using PowerPoint

Richard H. Daffner [1]

Radiologic teaching has changed dramatically as we have moved into the new millennium. Computerized presentations are not only gaining popularity but are in large part replacing traditional 35mm slide shows. Indeed, the Radiological Society of North America and the American Roentgen Ray Society are now requiring all of their presenters to use the computerized format. The most popular program is PowerPoint (Microsoft, Redmond, WA). PowerPoint is versatile and, with a little practice, easy to use. Indeed, recent publications [1–3] have given readers valuable tips on how to prepare PowerPoint presentations.

The May 2000 issue of the *American Journal of Roentgenology* presented an opinion paper titled "On Improvement of Scientific Presentations" [4]. It gave suggestions to potential presenters and concentrated primarily on slide presentations. PowerPoint gives authors and speakers an extensive array of tools for preparing their presentations. Although the latest version of PowerPoint has a number of features that add a touch of elegance to presentations, any recent version will produce superb results. Furthermore, it is available not only for Windows-based systems (Microsoft) but also for Apple Macintosh (Apple, Cupertino, CA) platforms. The purpose of this paper is to review the old rules for slide presentations and to offer pointers on avoiding pitfalls that are common in the newer computerized presentations, specifically animation.

Old Rules

It matters little whether a presentation is in slide or PowerPoint format. The color schemes used for the presentation, however, are very important. Background and lettering colors should please the eye and should not clash or produce eyestrain [4, 5]. For the background, darker colors work better than light colors. A medium-blue background with yellow or white lettering is easy to read. Black letters on any background produce eyestrain.

Among the advantages of PowerPoint are its predesigned backgrounds. Although many of these look pretty, the reader is cautioned to choose a plain background whose color scheme allows comfortable viewing. Although many authors use the same background for the entire presentation, I find it preferable to use a solid black background when showing images. Changing to a black background adds a little work during the preparation of the talk. However, the positive side is that no colors or patterns will distract from the images shown. Furthermore, the solid background makes the images easier to see [6].

The font used for lettering is also important. PowerPoint offers a large number of choices. Some of the more popular fonts are Arial, Book Antiqua, Times New Roman, Trebuchet, and Verdana. Each of these, and many others, are easy to see on the screen. More important, however, is the choice of serif or sans serif fonts. Serif fonts have little tails on the letters; sans serif fonts do not. Current typographic practice suggests sans serif fonts for headings and serif fonts for detail text. I personally prefer to use the same font for an entire presentation because it looks more uniform. Presenters disagree about whether it is better to use capital and small letters or all capital letters. I prefer a style that uses all capital letters because I believe it is easier for the audience to read.

With a background color other than black, the shadow feature may be used to emphasize the letters. However, when a black background is used, the shadow feature makes the letters appear fuzzy. Therefore, you should refrain from using the shadow feature in this mode.

Slide Content

The old rule of thumb to avoid crowding of data on a slide was that if you were able to hold the finished slide at arm's length and still read the data, the audience should not have any difficulty seeing the slide from the back of the room [4, 5]. Unfortunately, we cannot hold a computer screen at arm's length to achieve the same

Received November 1, 2002; accepted after revision December 12, 2002.

[1] Department of Diagnostic Radiology, Allegheny General Hospital, 320 E. North Ave., Pittsburgh, PA 15212–4772. Address correspondence to R. H. Daffner (rhdaffner@netscape.net).

AJR 2003;181:47–49 0361–803X/03/1811–47

goal. Three new methods may be used to determine the readability of content. The first is to walk to the other side of the room and view your computer screen from approximately 10 ft (3 m) away. If you can still read the words on the slide, the audience should also be able to read them. The second method is to transfer the data onto a floppy disk and actually project it in the conference room where it will be presented. This method, though, may be impractical. The third and perhaps best method is to limit the number of lines on a data slide to no more than seven. Those seven lines include both the major headings and the subheadings.

Regarding the images themselves, PowerPoint allows a large number of images to be contained on the same slide. The ideal number is two per slide. However, you may show four images at the same time as long as no single image is larger than 25% of the total area on the slide. To avoid this pitfall, particularly when showing comparative studies, I find it preferable to use animation to build an image. This technique will be described later.

Regardless of which method is used to determine readability, the common denominator will be the actual size of the fonts used. As a rule, major titles should be in 44- or 48-point type. For the subheadings of the slide, fonts should be no smaller than 32 points in the first level, 28 points in the second level, and 24 points in the third level. It is best to use no more than three subhead levels.

There is a "Slide Master" feature of PowerPoint that allows you to preset a number of features for the presentation, such as background color, font sizes, and bulleting. The generic "Master" uses a variety of symbols for each level of bulleting. Uniformity of bullets improves the overall appearance of the presentation. Click "Format" on the command bar above the toolbar. When the "Format" menu appears, select "Bullets and Numbering" to bring up a menu that allows you to choose a variety of bullet and number styles. To make all the bullets uniform within each text level, however, you must first highlight the entire text area in the lower portion of the "Slide Master," and then click the desired bullet style with the mouse.

Preparation of Images

PowerPoint allows you to directly import images after they have been stored on the hard drive of your computer. These images may come directly from a digital camera, or they may be the result of digitization of slides. A number of excellent programs, varying in cost, are available for processing the images. These programs include Adobe Photoshop (Adobe Systems, San Jose, CA); Adobe Photoshop Elements (which costs less than its "big brother" but still offers a sufficient subset of features); Corel Photo House (Corel, Ottawa, Ontario, Canada); and of course, the image manipulation tools included in the PowerPoint program.

Most digital cameras come with software that lets you process and adjust the images. You can crop the image, convert colors to gray scale, remove patient-identification data, and cover unwanted bright spots that would detract from the finished product. Adobe Photoshop software has an additional useful feature that allows you to color in or to cover up any unwanted parts of the slide by simply matching the background color and then painting over the unwanted areas. I find this feature preferable to the blocking feature in PowerPoint because it more accurately matches the background color.

Animation

Animation offers a wide variety of choices for slide transition and presentation of data. Animation should enhance and not distract from the information being presented. It has been my observation that this is the feature most often misused and abused by presenters. In general, novices often go overboard on the animation features because it looks cute. The two most popular animation features are slide transition and custom animation.

Slide transition determines how the slides will appear as they advance from one to the next. The presenter can opt for no transition, in which a simple click of the "Next" button will bring the next image onto the screen; or for any of a variety of visual transitions, which include horizontal or vertical in-and-out, checkerboards, uncovering, or wiping. I prefer no transition. Its simplicity has particular advantages when you are using the same title for introducing additional material. The title remains at the top of the slide while the data or images beneath change. The slide transition program allows sounds to occur while a slide is transitioning. Sound effect options include applause, breaking glass, gunshots, laser effects, ricochet, and screeching brakes. I recommend the "no sound" option for transition.

The custom animation feature can significantly enhance the program—or if it is misused, significantly detract from the program. This feature allows you to pick the order, timing, and visual effects for bringing data onto (or taking data off) the screen. Once again, the options cover a wide range, from simply having the images or words appear to having them appear with a number of effects, including flying in, flashing in, dissolving in, or zooming in. For words or for data, I prefer to use the dissolve feature because the words or numbers appear to dissolve onto the screen. When introducing images, I generally have them appear in sequence. If I am building an image—that is, layering one image on top of another—I will have the new image simply appear so that it completely covers the previous one. Arrows should either appear, or dissolve in, at the spots where they belong. Arrows that fly in from the side or the corners of the film are extremely distracting. After all, we are talking about a scientific presentation, not a Robin Hood movie.

Presentation

In many instances when PowerPoint presentations are given, time is lost while the computer is started and the program is booted up. I recommend having your laptop turned on and the program ready to go. Schreibman [1] recommends creating a shortcut on your computer desktop that can launch the program immediately after right-clicking the mouse to open a menu that says "Open." A potential problem of having the laptop turned on is battery drain. I recommend that the power cord be connected to a protected power source, if possible. If not, you should make sure your battery is fully charged before you go to the lecture hall. Making use of the standby or sleep mode of the computer saves the battery. You can avoid additional delays if the conference center has several computer hookups available so that speakers can connect and boot up before their presentation. An alternative would be to have a slave computer onto which a speaker can load his or her program from a CD or memory stick.

Presenters should also be familiar with bringing their program onto the screen once the laptop is connected to the projector. Fumbling creates one of the most annoying delays that I have seen. The procedure is simply pressing the "Function" key and "F8."

Regardless of which format is used for PowerPoint presentations, it is imperative that the speaker preview the talk beforehand to identify any computer glitches. Many times I have found it necessary to make last-minute

changes in the presentation. I also recommend that all talks be saved on a backup CD or on a memory stick. When you prepare a backup for your programs, remember that floppy disks are inadequate for storing most PowerPoint programs. A review of information from several Internet search engines indicates that the X rays used to screen carry-on luggage at airports do not harm laptops. Metal detectors that use strong magnetic fields theoretically could erase a computer's hard drive. The greatest danger, however, is the possibility of theft at the security checkpoint. Prudence dictates that you should always have a backup system.

Finally, I have a few comments on the use of arrows, or pointers. In traditional slide presentations, speakers have been limited to using laser or other light pointers to emphasize portions of their slides. With PowerPoint, speakers have more options. The first is, of course, to continue using conventional laser or other light pointers. The second is to use arrows on the images themselves, and the third is to use the mouse to highlight areas. If the first option is used, the presenter is cautioned about aiming the pointer directly at the portion of the slide where the emphasis is needed. It is important not to wave the pointer around, because the motion distracts the eyes of the audience. The pointer should be turned off when the emphasis is no longer needed [4].

Using arrows directly on the material presented is an effective way to emphasize important aspects of the slide. Although adding arrows to each slide is time-consuming, the rewards outweigh the extra effort, particularly when the following procedure is used: I work with the animation feature of PowerPoint to bring arrows onto each slide. As I mentioned, I find it much less distracting to have them simply appear or dissolve in, and I do not let them fly into the picture. You also have the option of having the same arrows disappear if you need the slide to remain up longer to emphasize a different portion of it.

The third and most popular method of pointing is to use the computer mouse. It is an effective method but carries several caveats. The first, and most obvious, is similar to the use of light pointers. The second, and more important, is the way the mouse is used. Most speakers tend to bring the arrow into the slide from the side. This maneuver causes the viewers' eyes to focus on the moving arrow instead of its ultimate resting place. Unfortunately, this distraction cannot be avoided.

The reader is cautioned that when using the mouse for emphasis, it should be withdrawn from the slide as soon as practicable. I have seen too many instances in which the arrow is left in place on the screen while slides continue to change. It is only natural for the viewers' eyes to be drawn to the arrow instead of to the rest of the slide. Some of the newer PowerPoint versions automatically turn the mouse off when each slide is changed. Furthermore, in the latest versions, the mouse automatically goes off after about 30 sec.

Summary

PowerPoint presentations allow speakers a greater degree of flexibility for presenting their data. Although it is a newer format for presentations, the old rules regarding background and lettering colors on each slide, the number of words on the slide, and the protection of patient confidentiality remain [4]. In addition, authors are cautioned regarding the use of animation. Too much of a good thing can detract from the overall value of the talk.

References

1. Schreibman KL. PowerPoint pointers #1: hello, and two great tricks. *AJR* 2001;177:1017–1018
2. Schreibman KL. PowerPoint pointers #2: getting images into PowerPoint. *AJR* 2001;177:1271–1272
3. Caruso RD, Postel GC. Image editing with Adobe Photoshop 6.0. *RadioGraphics* 2002;22:993–1002
4. Daffner RH. On improvement of scientific presentations. *AJR* 2000;174:1229–1231
5. Thompson WM, Mitchell RL, Halvorsen RA Jr, Foster WL Jr, Roberts L. Scientific presentations: what to do and what not to do. *Invest Radiol* 1987;22:244–245
6. Daffner RH. Visual illusions in computed tomography: phenomena related to Mach effect. *AJR* 1980;134:261–264