

Guidelines for digital scientific presentations

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In the world of scientific and professional presentations, the digital age has made an immense transformation. With these advances, digital media can be used to assist and enhance communication without losing the message. This article discusses guidelines for the presenter of scientific presentations with digital media. (J Prosthet Dent 2002;88:649-53.)

The Digital Age has transformed the manner in which scientific material is presented to professional audiences. With recent technological advances, speakers presenting information have greater options in delivering their material. Most notably, speakers are able to use new media to assist and enhance presentations.

According to a study by Flemin and Levie,¹ attitudes help shape subsequent behaviors that determine actions, such as attention to and acceptance of instructional messages. People pay attention to what they enjoy and ignore or misinterpret what they dislike. Information is retained when it is consistent with attitude and disregarded when it conflicts with attitude.¹ Therefore it is wise to address what shapes an audience's attitude toward presented material, especially because the way information is presented affects whether the material will be effectively communicated.

The differences in attitude when an integrated media system was used as the method of presentation, compared with the conventional oral lecture, were examined.² It was concluded that the type of presentation (digital presentation) had little or no effect on the students' attitudes. This study suggests that it is the method and not the medium that influences the psychological processes that allow learning to take place.²

In scientific presentations engaging and clear visuals complement the speaker's role of translating and communicating information. Combining live lecture format with projected images and text stimulates audience attention and retention.

Video projection presentations with presentation software such as PowerPoint (Microsoft Co, Seattle, Wash.) have become increasingly popular because of the software's many advantages. Regennitter³ states that these advantages include ease of making last-minute changes and customization, the ability to incorporate multimedia files, portability, and cost reduction.⁴ Other advantages include ease in duplicating photographs with no loss of quality, the ability to update and personalize each presentation, and flexibility in preparing the pre-

sentation itself. Tediously loading individual slide carousels is a thing of the past.

Beginning the process of making a visual presentation is, in some ways, like directing a movie. A director must bring together many different elements to create an engaging narrative. This is precisely what an effective speaker does. Proper presentation software will allow the speaker to develop such a moving picture show with text slides, animation, still photographs, video clips, and sound. Although it may be important to have different dynamics in a visual lecture, simplicity is paramount and should never be sacrificed.³⁻¹⁴

With increasing numbers of presenters using video projectors and computers, a discussion of the factors that influence the quality of a digital video projection presentation seems prudent. This article discusses the factors that would improve the quality of a scientific presentation by use of digital media.

CONTENT AND DESIGN

A great presentation is a combination of content, design, and delivery. *Content* refers to the actual information being presented, whereas *design* is the actual layout of the slides and photographs.¹⁶ These 2 elements are the primary focus in this discussion.

Many factors create the design and layout of a slide such as backgrounds, composition, slide format, color, text size, typeface selection, photographs, video clips, animation, and slide transition. Regardless of the format used in the presentation, continuity should always be the rule. Maintaining the same fonts, colors, graphic styles, and backgrounds creates flow in the presentation. Changing these facets can confuse the audience and distract from the message.^{16,17}

TEXT SLIDES

Composition of the slides necessitates simplicity, clarity, and legibility. Title placement can determine the readability and visual appeal of the slide. The title should be placed in the top one-sixth of the screen to allow room for bulleted items, charts, graphics, or photographs. This will keep the slide less cluttered. Poorly placed titles and the wrong size font can crowd the text, resulting in difficulty for the reader¹⁸ (Fig. 1).

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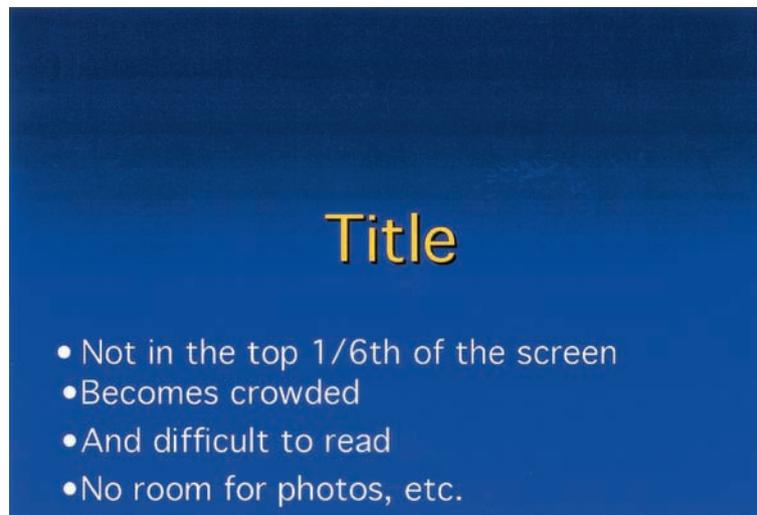


Fig. 1. Title should be located in top one-sixth of slide. Placing title below this level crowds slide.

Color enhances a presentation and brings appeal to the slide. Using the wrong color or too many colors can distract and confuse the audience, thus conveying the wrong message. The title, text, and background color should be chosen carefully to enhance the presented information. Excess color contrast or a lack of color contrast can cause eyestrain, which could result in lost audience attention.^{8,16,17}

Color's capacity to radiate or reflect light should be considered. Good contrast increases higher visibility. A combination such as blue with white or yellow text is ideal.⁵ A red and black combination would be less ideal. Dark combinations are difficult to read. Red, yellow, and orange are hot colors, best suited for foreground material and not backgrounds. These colors draw attention to the subject. Colors such as blues, greens, and purples are best for backgrounds but may also be used in foreground if they are lighter or darker than the background.¹⁶ A study with medical students as subjects was performed to determine which color combinations were most effective for clarity, recall, and overall attractiveness of the material. The authors concluded that plain dark backgrounds such as blue, purple, or green, in combination with white letters for the text and yellow letters for the text of the slide (Fig. 2) were more effective.⁷

The 2 main classifications of typefaces are serif and sans serif fonts. Serif fonts have small flourishes extending from the main strokes of the letter. These fonts are best suited for print material. Sans serif fonts have straight, clean lines and are best suited for electronic presentations. Examples of serif fonts are New York, Times, and Apple Chancery. Examples of sans serif fonts are Geneva, Helvetica, Arial, and Monaco. No more than 3 fonts should be used in a presentation.¹⁶ One typeface can be used for the title, 1 for the text, and 1 for individual text on an individual slide. If the fonts become too heavy with italics or too graphically de-

scriptive, the audience will have difficulty deciphering the words.^{3,5,15}

Chavis et al⁹ examined the recall of information from 90 medical students. The students were shown a 29-minute, 45-slide presentation with different colors and fonts. The students studied each slide for 10 seconds and then had 25 minutes to recall the information. The results demonstrated the highest recall of information from the slides with block print than those with cursive print. The highest in retention were slides with orange block print on a raspberry background and the lowest was yellow cursive print on a black background (Fig. 3). The conclusion was that typeface simplicity and color may help improve the retention of material presented.

Text sizes are measured in points signifying the font height, in which 72 points equals 1 inch. With printed material, such as business letters, the usual point used is 11 or 12 points. As a guide to digital presentations, 18 points is the minimum, with an average of 24 points for the text and 48 points for a title. These are averages and will vary depending on which font is used.¹⁶

The amount of text per slide varies in recent graphics presentation literature. The rule of six is recommended:¹⁸ 6 words per line, 6 lines per slide, and no more than 6 text slides in a row. Another author suggests the 8 by 8 rule, in which there are no more than 8 words per line and no more than 8 lines per slide.¹⁶ In the dental literature, it has been suggested that no more than 15 words per slide be used.⁵ It is also suggested that phrases be used rather than complete sentences.¹⁸ The goal is to have the audience understand the slide within 4 seconds.⁵

PHOTOGRAPHS

Photographs and drawings are an essential part of the scientific presentation. Historically, this has been the

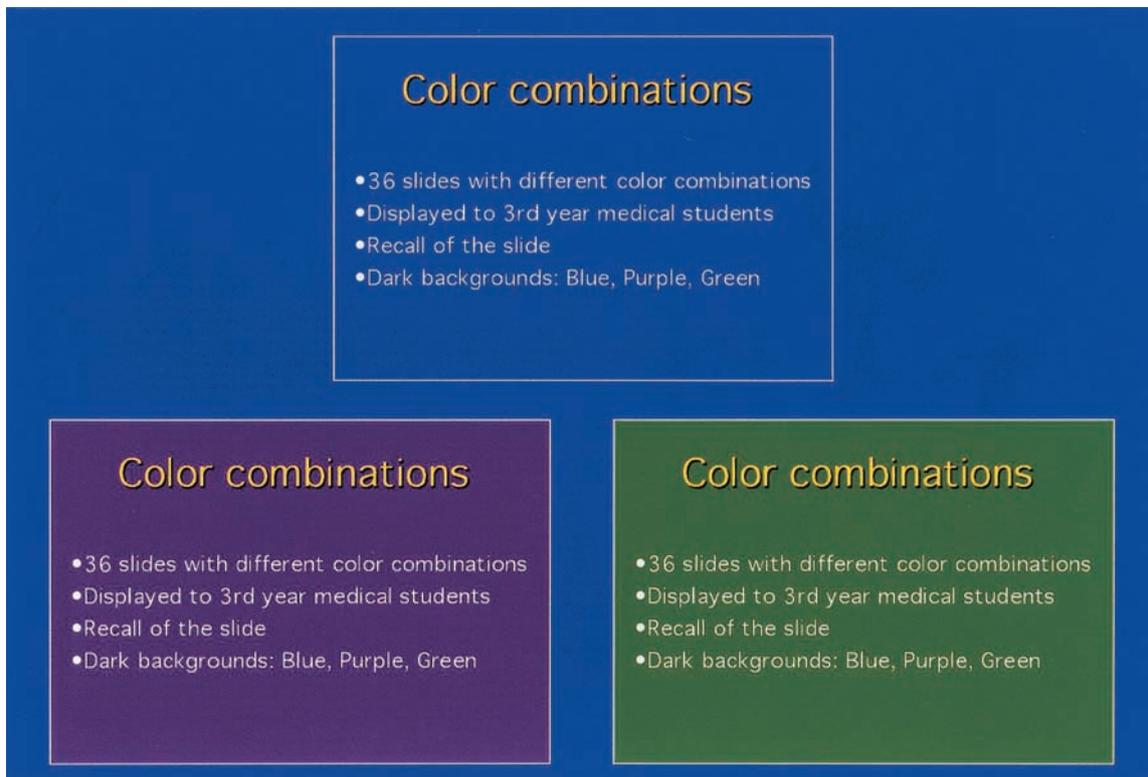


Fig. 2. Blue, purple, and green backgrounds with yellow titles and white text were found to have highest recall from different color combinations.



Fig. 3. Highest recall of information considering fonts and color combinations were slides with orange block print on raspberry background. Yellow cursive fonts with black background were found most difficult to read and recall information.

weakest point in a digital presentation because of either the quality of the original image or the quality of the projector. There are 2 ways that photographs can be added to a presentation: through scanning or digital creation. Scanning procedures and digital camera technology are ever increasing in quality, but the limiting factor is the quality output of the video projector. Digital photographs are easily cropped, aligned, and color-corrected in photo-editing software, such as Adobe PhotoShop or Adobe PhotoShop Elements (Adobe Systems Inc, San Jose, Calif.). This allows the presenter to precisely show the subject and provides the best composition of the photograph. Photographs can be added to

text slides so the audience can see text information and photographs on the same slide. The audience does not have to look at 2 or 3 different screens, which draws attention away from the text and information slide.

When digital photographs are used in a presentation, ensure that the digital image file has been labeled JPEG (Joint Photographic Experts Group) or condensed in file size. Photographs in a JPEG format at 72 dpi (dots per inch) will be at the quality of most video projectors (1024 × 768) and will be at a size manageable for most laptop computers. Good-quality photographs have large file sizes, but the large file size also will increase the file size of the presentation. The increased size will slow the



Fig. 4. Square border frame in black or white, 2.25 points wide, will highlight photograph.

computer and the program's ability to bring up the next slide or photograph.

Photographs should be cropped and sized before being placed in the presentation. PowerPoint allows for cropping and resizing; however, when cropping a photograph in the presentation, the program will remember the original photograph and its size. Therefore cropping in the presentation will not decrease the file size. Resizing the photograph more than 10% larger or smaller will reduce the quality of the photograph. PowerPoint must arbitrarily add or remove parts of the image to increase or decrease the size of the image.¹⁶

Pictures create the photographic imagery of the text.¹⁶ Adding a frame to the photograph makes the picture even clearer on the slide. A square border measuring 2.25 points will highlight the photograph, because sometimes the color of the photograph or its background will blend too closely with the slide background (Fig. 4). A contrasting border will set apart the photograph and will improve the detail of the picture.

Aside from pictures, embedded video clips can also be used. The addition of video is easy and nondisruptive. Instead of stopping the presentation to turn on a video cassette player, the embedded video clip will play with the point of the mouse or automatically. Video clips should also be compressed, with the most common form being MPEG (Moving Pictures Experts Group). This form of compression is similar to JPEG format for pictures. Video clips should be limited to 2 minutes to prevent the audience from becoming bored, distracted, or entranced. If the clip is longer, the speaker will have difficulty regaining the audience's attention.¹⁶

SOUND AND ANIMATION

When used correctly, sound is a powerful tool that can attract the attention of the audience. Many times sound is overused and undermines the authority of the presenter. Sound should only be used sparingly to add impact.⁴

Animation adds the finishing touches to a slide presentation. It can be added in 2 forms within the slide builds and from slide to slide transitions. Use of too much animation can distract the audience and detract from the message. It is best to use 1 or 2 carefully placed effects throughout the presentation. Random effects should be avoided, because they can be disruptive.

Animation can be used to focus the audience's attention. Words, lines, paragraphs, charts, photographs, or objects can be added one at a time or in groups and can be timed to necessary text. Information is thus disclosed in small portions, helping to captivate an audience. Animation can dramatize a particular point and allow the audience to refer back to certain information. It also prevents the audience from reading ahead and not listening.^{3,13,17,18}

Transitions blend one slide into the next in a variety of ways; PowerPoint offers many choices. However, if transitions are too active, the audience might get dizzy and disoriented. Consider creating a continuous background and building the transitions to help integrate the presentation. A clear and integrated presentation keeps the audience focused.¹⁸

Rieder⁵ states, "the effectiveness of a presentation is not measured by the number of screens or projectors but will vary with the speaker's objective." Although use of 3-screen projection has increased in popularity for dental presentations,⁵ one screen is typically used for digital presentations. However, some speakers have chosen to

present with 2 computers, 2 video projectors, and 2 screens. Digital presentations are unlike 35-mm slide presentations in that there is progressive movement and transitions. A presentation thus becomes a story told with a series of moving still photographs and texts.

EQUIPMENT

Computer presentations require a multitude of equipment, and having the correct equipment is quite important. Regardless of the type of computer, PC-based or Apple Macintosh, connecting a data projector or video projector to the computer's external display port is simple. The presenters should first familiarize themselves with equipment compatibility, taking care in knowing which connectors are required. Some laptops require specific attachments to connect to the display port. There are many projectors with choices of resolution, lumens, size, weight, and portability. Although this article is not intended to be a guide in choosing a projector, the projector should be considered.

An infrared advancer generally accompanies projectors. The projector may be rented or supplied by the organization and may not have an advancer. Therefore the presenter should have his or her own compatible advancer. There are many types of advancers available and they range from infrared versions to radio frequency types.

Room setup is important for a digital presentation. Typically the projector must be in the middle of the room or near the front of the screen. The speaker's computer should be easily accessed in the event of any computer problems. With a digital presentation, a single screen that maximizes the room is preferable, especially for large audiences.¹⁸ Newcomers to PowerPoint or other presentation software can become overwhelmed with the possibilities of producing and directing their presentations. Overuse of functions such as animation and sound can make presentations hard to follow, distract the audience, and make the subject matter cartoon-like. However, such situations can be avoided with a carefully choreographed presentation. With the growing number of digital presentations, these guidelines have been offered to assist the speaker in preparing an effective audiovisual lecture. It must be emphasized that it is the speaker who commands the attention of the audience and not the medium in which the material is presented. Other sources of information may be found with a number of presentation Web sites (Table I).

SUMMARY

Digital presentations have many advantages; however, if they are not planned with care, the speaker may lose his or

Table I. URLs of presentation web sites

<http://www.wilderpresentations.com>
<http://www.presentersuniversity.com>
<http://www.powerpointers.com>
<http://www.presentations.com>

her message. Digital technology can improve a mediocre presentation and can turn a very good presentation into a valuable learning experience, a source of entertainment, and a joy to both the presenter and the audience.

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