

# CREATING EFFECTIVE SLIDES

By SL O'Connor, MA, MFA

Medical Writer, Editor, Producer, Palm Coast, FL

## ABSTRACT

*The guidelines for making effective slides have not changed since the dawn of audiovisual learning media. What has changed are the ways slides are used. For very different formats and purposes, we still apply the name "slide." Confusion over purpose often leads to ineffective design, which detracts from learning possibilities. To design and create an effective slide program, we need to know the intended purpose, setting, and audience.*

Long ago, photographers discovered that sliding transparent images in front of projected light created interesting entertainment possibilities.<sup>1</sup> Teachers and communicators began waking their audiences by accompanying lectures with projections of photographed images.<sup>2</sup> Each piece of developed, transparent film went into a frame made of cardboard, metal, or later plastic, allowing the film to slide easily in and out of a still projector. The name "slide" stuck.

Fifty years ago, Kodak developed the Carousel, a round tray that held a collection of films, fit onto a projector, and did the sliding at the touch of a button. The Carousel allowed instructors to keep slide collections and made it possible to view slides in a continuous program while speaking. The "slide" came to be a standard format in the medium of audiovisual communication tools.

Although we no longer use film or film projectors, the purpose of creating slides is still to capture the audience's attention by succinctly presenting a speaker's presentation points. Effective slides help the audience lock information into memory. The guidelines for making effective slides have remained consistent but have not always

been practiced and disseminated.

Unfortunate practices have taken hold, and what we call "slides" are too often projected versions of a lecture, copies of published data, or visual aids more appropriate for individual study on a computer screen.

Creating effective slides is complicated, even though a successful result appears simple. Writers must understand the information being presented, judge the relative importance of various parts of the information, and organize the information visually in such a way to accompany and enhance the spoken presentation. Slide design requires extracting and translating information into visual images to emphasize the points of the presentation.

Many beginning medical communicators, physicians, and instructors receive no professional training in creating slides, instead learning from others who did not use the slide format well. Visual design and audiovisual perception are rarely included in the training of those who create medical education programs. As a result, the use of ineffective slides is perpetuated. If we do not know what makes a slide presentation effective, we may work very hard at creating ineffective communications.

## GOOD AND BAD SLIDE PRACTICES

Although great for some purposes, audiovisual media are not the answer to every presentation need. Before we can plan an effective slide program, we must answer some basic questions:

- Is the slide program introducing a new subject or technique, presenting a point of view, or reviewing information?
- Who will be viewing the slides? What is their level of understanding and familiarity with the subject?

- Will the slides be projected in a large lecture hall, be viewed on computers in a classroom, or be used in another way?

A slide that is effective for one purpose, in one setting, with a particular audience may not work for a different purpose, setting, and audience. If the purpose of a presentation is to give an overview of studies or to introduce important concepts and strategies, a slide format can work well. When the purpose is to review tables of results from studies or compare complicated graphs or charts, printed materials provide a better choice for presenting detailed information.

When a slide is too complicated, the audience loses focus while trying to figure out the slide. Worse, they become distanced, critical, and resentful. Many slide templates are so busy that the audience has difficulty finding the important details. Information presented in slides needs to be much simpler than images (diagrams, tables, graphs) published in textbooks or journal articles.<sup>3</sup>

The purpose of a live presentation is to allow for instruction and interaction, yet most of us have experienced slide presentations in which there was little or none of either. Perhaps the most basic guideline for creating effective slides is that every word on a slide should be readable by every member in an audience.

In too many presentations, the speaker reads every word to the audience. Presenters commonly relate to their slides as if the words on the slide *are* the presentation. When a speaker puts an entire lecture on slides, the type size is usually too small for the audience to read. In an effort to make it easier for attendees to read the content of slides, presenters provide printed cop-

ies. Whether being read to by the presenter or reading along from a printed handout, the audience cannot read, listen, and comprehend at the same time. Rather than enhancing the focus on the presentation and engaging the listener, the handout *replaces* the presentation. It provides information but no opportunity for interaction. The presentation becomes a reading exercise, and the chance for real learning is lost. It is not surprising when busy audience members grab a copy of the handout and skip the actual presentation. Describing an effective lecture, Copeland et al. advise medical educators not to use slides as speaker's notes.<sup>3</sup>

### THE PROBLEM WITH POWERPOINT

Michael Alley, a professor of engineering at The Pennsylvania State University, has been on a mission to transform scientific presentations after attending too many that were boring and inadequate. In several books and on a Web site, Alley has attempted to explain and correct ineffective audiovisual teaching practices.<sup>4,5</sup> Alley is one of many who emphasize the problems inherent with using the PowerPoint program to design slides, with its deadly "...default design of a single word or short phrase headline supported by a bullet list."<sup>4</sup> He notes that words and bulleted lists become

monotonous and are not effective for enabling information recall.<sup>4</sup>

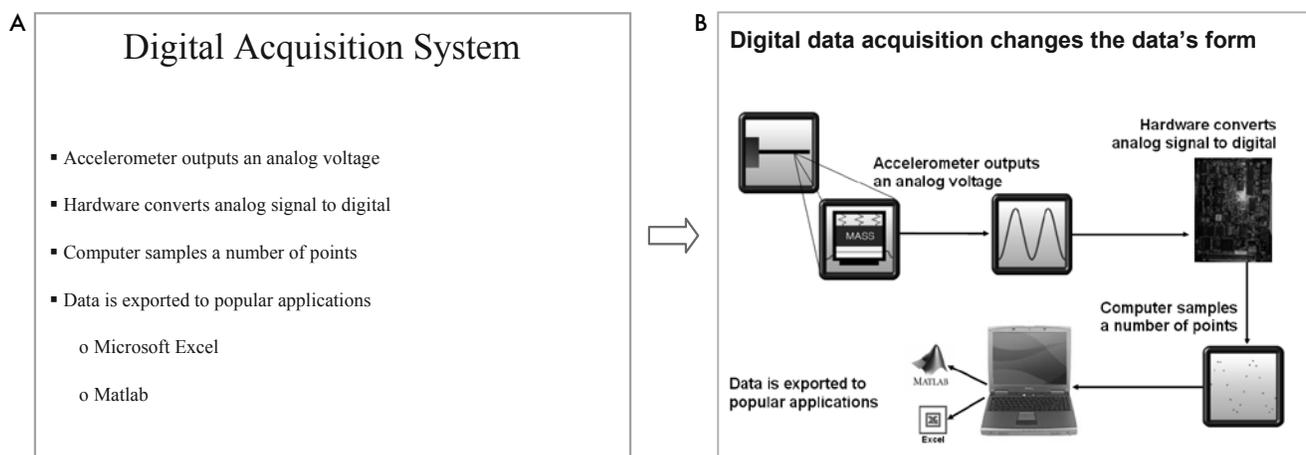
Most people who write and design slides are less than fond of PowerPoint, but it is the primary slide design software used by the world. Robert Gaskins and Dennis Austin, the inventor-designers of PowerPoint, have said they deplore that the program has replaced rigorous writing and thinking.<sup>6</sup> Designer and information analyst Edward Tufte noted that scientists should know better than to use an inadequate software program for presenting serious data. PowerPoint is too often used for "capturing, editing, and publishing text, tables, data graphics, images, and scientific notation," he says.<sup>7</sup>

Bad slides are not the fault of PowerPoint; bad slides are the result of ineffective efforts to use the slide format inappropriately. When we do not understand the relationship or importance of the information, a bulleted list or any other aspect of design may well end up confusing rather than aiding memory. When we understand the principles of audiovisual perception and know the purpose of a slide program, we can use any software to make effective slides. The medium may contain the message, but the software does not determine the medium.

### COMPUTER-BASED LEARNING

Alley calls his solution to the problem the assertion-evidence slide. He uses a complete sentence as a headline (the assertion) and then presents visuals to prove the assertion (the evidence). Beginning with a sentence assertion headline brings focus to the presentation and eliminates the common problem of repetitive headers. Providing relevant visual information enhances learning. While some of Alley's slides using the assertion-evidence format are simple enough to accompany a presentation effectively, others are quite complicated. Many of the slide bodies are full of information, illustrations, or photos. The design is really a new format, a self-contained teaching program or visual aid (Figure 1).

Interaction with a presenter or an instructor is often absent when slides are used as part of a computer-based program or as online assignments. Many education programs use the slide format as a substitute for print format, without regard for the rules of timing and perception inherent in the slide format. Alley's assertion-evidence slides require attendees to take time to study the images and discover the information at their own speed. Even a complicated image can be a useful learning aid when used in this setting (Figure 2). When an audio program



**Figure 1.** Traditional slide (A) transformed into a visual aid (B) using the assertion/evidence format. Reprinted with permission from Michael Alley. (Available at <http://www.writing.engr.psu.edu/slides.html>.)

## The research question is whether the dunlins of Iceland and the Baltic Sea are different subspecies



©Lars Erik Johannessen



If so, because the population of the Baltic dunlins is declining, it may be a threatened subspecies



**Figure 2.** Complex visuals require additional time for the audience to digest, whether or not accompanied by an audio presentation. Reprinted with permission from Michael Alley. (Available at <http://www.writing.engr.psu.edu/slides.html>.)

provides additional information, the audio *supplements* the visual, a relationship that is opposite that of the traditional audiovisual aid, in which the visual *supplements* the live audio presentation.

### THINKING VISUALLY

Projected visuals enhance our ability to learn information but only if the images comply with basic rules of human perception. Designing slides requires writers to have proficiency beyond good writing, including an understanding of audio and visual principles, teaching methods, and audience behavior.

Perhaps the main reason writer-designers resort to words and bulleted lists is that they simply do not budget adequate time for creating visual ideas. Any art director can attest that creating visual images takes longer than writing and editing. Before creating the visual concept, you must do the same research and organizing required for writing and editing. Thinking visually means doing it all—first the writing, then the design, and finally the visual presentation of the images.

What is an effective image? Images used in slides are not designed to

stand on their own; their purpose is to emphasize and enhance the presentation. *Reinforcing* is not the same as *capturing* the audience's attention.

### DESIGNING CONTENT

The basic concepts of visual design include the languages of space, size, positioning, and intensity, which psychologist Stephen Kosslyn applied to graphing data and now has developed into a book about creating slides.<sup>8</sup> Educational researchers Clark and Mayer note that learning is enhanced only when visual elements are relevant. Adding irrelevant visuals, sounds, or words distracts the audience and impairs learning.<sup>9</sup>

The audience's perspective is an important consideration when designing slides. Michael K. Gilson, PhD, MD, chair of the newly created Computer-Aided Drug Design program at the Skaggs School of Pharmacy and Pharmaceutical Sciences at University of California, San Diego, gives advice to young scientists about creating slides for seminars based on his experience with the audience's reactions to ineffective slides:<sup>10</sup>

- Use “informative” heads to orient

the reader to the content; do not repeat the same head on multiple slides and do not repeat header information in the body of the slide.

- List the main point first; otherwise your audience may lose interest before you get to the main point.
- Use “terse” text; for example, use noun phrases rather than complete sentences.

Arthur Garson, Jr, MD, MPH, Provost of the University of Virginia, Charlottesville, and former Dean of the School of Medicine, has critiqued slide presentations from a seat in the audience and has concluded the following:<sup>11</sup>

- The most common fault is presenting slides with too much text or with too much data or with a typeface that is too small.
- It is absolutely unacceptable to ask your audience to wade through a slide with too much data.
- Footnotes should be avoided, as reference citations in the body of a slide force the audience to look for the source.
- The use of unnecessary abbreviations is confusing and does not aid memory, particularly for audience members who are not native speakers of the language used in the presentation.

Most of the common problems result when slide creators do not use the basics of psychologic perception in designing slides (Table 1).

### THE ESSENTIALS

Over the years, based on research and experiences preparing and using slides for lectures and teaching presentations, I developed a list of guidelines, which address the basic minimum rules for creating and presenting effective slides. In some circumstances, we may be required to break the rules, but knowing the rules allows us to break them in the least problematic way. Medical writers often write slides for others to present, but we cannot design an effective slide presentation without under-

**Table 1.** Basic Concepts of Visual Perception

Perception	Concept	Design
Primacy	We see the whole before its components	Use the first visual impression to create meaning
Proximity	We see objects near each other as a group	Use spacing to create meaning
Similarity	We see similar objects as a group	Use visual relationships to give meaning
Continuation	We see patterns and groups	Arrange data and objects to create meaning
Closure	We fill in gaps in a pattern	Use breaks intentionally

standing how design affects content, creates perception, and is the basis for relating to our audience (Table 2).

**THE FUTURE OF SLIDE PRESENTATIONS**

Will slides survive as a useful teaching tool? Will classroom computers replace

instructors, substituting for them with audiovisual lessons that students can study and repeat as often as needed? While we cannot predict what medical communications will look like in the future, we know that to be effective, instructional media must adapt for each purpose, audience, and setting.

If the computer design world develops new software and visual arts engineers create new presentation hardware, the world of education will still need media specialists who can create effective images that convey meaning. No computer program can translate complex concepts into simple visual images, and no design program determines layout. Whatever formats survive in the future, the essential elements for producing effective audiovisual programs will stay the same. Medical communicators who write and design these programs will be, as they are now, in charge of the information and its presentation.

Many resources on slide design are available online, including several new books on slide design for medical and scientific subjects. We may turn this around yet.

**Table 2.** Basic Essentials for Creating Effective Slides

Slide Element	Best Bet	Why	Tricks
Arrangement	1 point per slide	A slide's purpose is to make a point	Sometimes one word or one image is sufficient
Font Color	Black (or dark) on a white background	People remember black on white better	Use subtle backgrounds to create tone
Color	Don't overdo it!	People are interested by color	Use color to add meaning
Testing of Size & Colors	Project slides in a room of the appropriate size and lighting	Is everything readable? Are the colors right?	If you skip this step, prepare to be surprised!
Images	Simple and relevant	Design and color should enhance content	If it is not working, take it out!
Software	Allow sufficient time to design and refine ideas	Thinking visually takes longer than writing words	Test the images on others before using them with an audience
Hardware	Plan for problems	Problems happen	Take your own equipment
Audiovisual Principles	Never use words on a slide that are also spoken by the presenter	People cannot hear and remember what is said when they are trying to read the exact same words at the same time	Don't use "spoken language" or text on a slide
Coherent Whole	Each slide is a whole within the whole of the slide program	Each slide creates its own moment of focus and meaning	It is not just about the number of words, bullets, or images

**Author disclosure:** The author notes that she consults for companies that create slides for educational and promotional purposes.

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