Workshop - Rethinking the Design
of Presentation Slides

Michael Alley [1] and Leslie Crowley Srajek [2]

Abstract – **This workshop challenges the traditional design of presentation slides. Consisting of a phrase headline supported by a bullet list, the traditional design often appears in classroom and research presentations. In place of the traditional design, this workshop calls for a new design that consists of a succinct sentence headline supported by visual evidence. A pilot study has revealed that students understand and remember significantly more when the instructor relies on this new design as opposed to the traditional design. Using a template that follows the new design, workshop participants create a small set of teaching or research slides. Following that in the workshop is a peer-critique of these slides. In the past three years, this workshop has been well received at several distinguished agencies and institutions: the Environmental Protection Agency, Los Alamos National Laboratory, United Technologies, the University of Illinois at Urbana-Champaign, the University of Oslo, and Virginia Tech.**

Index Terms – PowerPoint, presentation slides, slide design, large classes.

INTRODUCTION

Each year, more than 250 million copies of Microsoft PowerPoint produce trillions of presentation slides worldwide [1]. Many of these presentation slides, which include overhead transparencies and computer projections, are used to teach science, technology, engineering, and mathematics (STEM). This method of teaching occurs in K-12 and in universities—especially in large university classes. Even in courses that incorporate active learning techniques such as think–pair–share, presentation slides often play a role in introducing new topics, framing questions, and serving as posted notes for what was learned. In addition to their role in the classroom, presentation slides are also the medium of choice for presenting STEM research. Because of its dominant 95 percent of market share [2], Microsoft PowerPoint and its defaults have greatly affected the design of these presentation slides. For that reason, many slides that are shown in STEM classrooms and STEM conferences have phrase headlines supported by bullet lists. Is this type of design, which this paper will refer to as the traditional design, the most effective design for helping students learn STEM subjects? Is this type

of design for slides grounded in solid educational research? According to many recent critics, the answer is no.

In the past three years, harsh criticism of the traditional design of presentation slides has surfaced in several popular publications: "Shuttle Inquiry Uncovers Flaws in Communication," *The New York Times* [3]; "Absolute PowerPoint," *The New Yorker* [4]; and "Is PowerPoint the Devil," *The Chicago Tribune* [5]. A common theme in these articles is that the presentation slides that follow the defaults of PowerPoint oversimplify the subject matter, sometimes with serious consequences. For instance, in an investigative report about the Space Shuttle Columbia disaster [6], Yale professor Edward Tufte argues that traditional slides failed to characterize the risk that the ill-fated Columbia faced from its collision with debris at lift-off. Another common theme of these articles is that the design quickly becomes monotonous for audiences, thus making it difficult for the audience to recall information.

According to Larry Gottlieb of Lawrence Livermore National Laboratory, a specific failing of traditional slides lies in the use of phrase headlines that leave unclear the purpose of the slide [7]. Since the 1980s, Lawrence Livermore National Lab has rejected the phrase headline and, instead, has advocated a short sentence headline that states the main assertion of the slide. Another failing of the traditional design of presentation slides, according to Edward Tufte, is the reliance on bullet lists to provide cogent evidence for assertions [8]. As Shaw and others point out in a *Harvard Business Review* article [9], bullets are "too generic," they "leave critical assumptions unstated," and they "leave critical relationships unspecified."

Arising in the past four years has been a new design that addresses both of these weaknesses. The new design calls for a succinct sentence headline, as was advocated at Lawrence Livermore Lab, but also adds a requirement that this headline be supported not by a bullet list, but by evidence presented in a visual arrangement [10]. Specific stylistic, typography, layout, and animation guidelines for this new design have arisen from more than 150 critique sessions of graduate research and senior laboratory presentations over four years—primarily at Virginia Tech [11]. The students making the presentations were first taught a sentence headline/visual evidence design of presentation slides and then asked to incorporate that design into their presentations. After the presentations, the audiences consisting of engineering faculty,

[1] Michael Alley, Associate Professor, Engineering Education Department, Virginia Tech, alley@vt.edu
[2] Leslie Crowley Srajek , Program Manager, Academy for Excellence in Engineering Education, University of Illinois at Urbana-Champaign, lcrowley@uiuc.edu

graduate students, and seniors discussed how easily comprehended, how memorable, and how persuasive the slides were. The lessons learned from these critique sessions were then incorporated into the teaching of the slide design for the next semester of students. The product of four years of these critique sessions has been a specific new design, for which a summary appears in Table 1. Given in Figure 1 is a visual contrast of this new design with the traditional design.

TABLE I
SUMMARY OF GUIDELINES FOR NEW SLIDE DESIGN [10]

Style
For every slide but the title slide, use a sentence headline that states the slide's main assertion;
In the body of each slide, present supporting evidence in a visual way—with images, graphs, or visual arrangements of text
Avoid bullet lists, because such lists do not show the connections among the listed items
For a class period, limit the number of slides so that at least 2 minutes can be spent on each slide

Typography
Use a bold sans serif typeface such as **Arial**
On a typical slide, use 28 point type for the headline and 18–24 point type for the body text (larger type is appropriate for the title on the title slide)
Avoid placing text in all capital letters

Layout
Keep blocks of texts, especially sentence headlines, to one or two lines
Keep lists to two, three, or four items
Be generous with white space, especially between elements within the slide

Pilot testing in a large geology course shows that the new sentence-headline design of presentation slides was more effective than the traditional phrase-headline design at teaching science to undergraduates [12]. The workshop discussed in this paper presents how to adopt this new design in classroom and research presentations. By the workshop's end, the participant will be able to do the following:

(1) distinguish between slide designs that allow for rapid comprehension of the content and designs that do not;
(2) distinguish between slide designs that make the content memorable and designs that do not;
(3) distinguish between slide designs that present the content persuasively and designs that do not; and
(4) create slides that follows the new design of a sentence headline supported by visual evidence.

The workshop accomplishes these goals through the following means: class discussion of many examples; creation by the participants of example slides that follow the new design; and peer critique of those example slides.

REFERENCES

[1] Doumont, J., "The Cognitive Style of PowerPoint: Not All Slides Are Evil," *Technical Communication* (February 2005), pp. 64–70.

[2] Schwartz, J., "The Level of Discourse Continues to Slide," *The New York Times* (28 September 2003).

[3] Wald, M.L., and J. Schwartz, "Shuttle Inquiry Uncovers Flaws in Communication," *The New York Times* (14 August 2003).

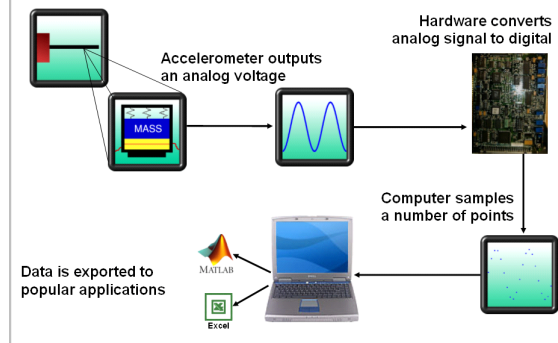[4] Parker, I., "Absolute PowerPoint," *The New Yorker* (28 May 2001).

FIGURE 1
COMPARISON OF TRADITIONAL SLIDE DESIGN AND NEW DESIGN [11].

[5] Keller, J., "Is PowerPoint the Devil?" *Chicago Tribune* (23 January 2004).

[6] Tufte, E. R., "Engineering by Viewgraph," *Columbia Accident Investigation Board,* vol. 1 (Washington, D.C.: Columbia Accident Investigation Board, 2003), p. 191.

[7] Gottlieb, L., "Well Organized Ideas Fight Audience Confusion," *49th Annual Conference for the Society of Technical Communication* (Nashville, TN: Society for Technical Communication, 7 May 2002).

[8] Tufte, E. R., "The Cognitive Style of PowerPoint" (Cheshire, CT: Graphics Press, 2003).

[9] Shaw, G., R. Brown, and P. Bromiley, "Strategic Stories: How 3M Is Rewriting Business Planning" *Harvard Business Review* (May–June 1998), pp. 41–50.

[10] Alley, M. P., *The Craft of Scientific Presentations* (New York: Springer Verlag, 2003), pp. 112–151.

[11] Alley, M. P., and H. H. Robertshaw, "Rethinking the Design of Presentation Slides," *Proceedings of the ASEE National Conference* (Nashville, TN: ASEE, June 22, 2003).

[12] Alley, M. P., M. Schreiber, and J. Muffo, "Pilot Testing of a New Design of Presentation Slides to Teach Science and Engineering," *2005 Frontiers in Education Conference* (Indianapolis, IN: ASEE/IEEE, 19–22 October 2005), paper 1213.