

An Analysis of Certain Factors Related to the Use of Powerpoint

Claude L. Simpson**

The University of Texas Pan American, Edinburg, Texas
(956)381-2843, (956)381-2834 (fax), csimpson@panam.edu

Lissa Pollacia

Northwestern State University of Louisiana, Natchitoches, Louisiana
(318)357-5718(office), (318)357-5990(fax)

Jimmy Speers

Southeastern Oklahoma State University, Durant, Oklahoma
(580)745-2492(office), (580)745-7479(fax)

T. Hillman Willis

Louisiana Tech University, Ruston, Louisiana
(318)257-3558 (office), (318)257-4253(fax)

Rick Tarver

Northwestern State University of Louisiana, Natchitoches, Louisiana
(318)357-6147(office), (318)357-5990(fax)

ABSTRACT

With more and more educators relying on PowerPoint presentation software to facilitate the delivery of course content as a lecture in a traditional classroom or via a distance education medium, it is important to ascertain whether it is a viable presentation tool. Current literature indicates that students feel negatively toward PowerPoint presentations, but is this really the case? The researchers conducted a study to determine student's attitudes toward the use of PowerPoint for delivering course materials, and in particular, several factors that contribute to the quality of a PowerPoint presentation were analyzed. The results of this study will help educators (as well as those who use this tool in business) determine if it is an effective aid in delivering ideas, or whether it is ineffective and its widespread use should be reconsidered.

INTRODUCTION

Many educators today rely heavily on PowerPoint and other visual presentation media for classroom presentations. Most textbooks contain PowerPoint slides as part of the instructor

materials that accompany the book. The convenience of these materials may lead faculty into thinking that this is a viable way to present subject materials. But is that really the case? Do students feel as if PowerPoint provides an effective tool for presentations of course material? Secondary research in the library and on the Internet led to the belief that student opinions were generally negative toward PowerPoint presentations. This study attempts to determine if students feel as if they are effectively learning materials presented using presentation software, such as PowerPoint.

Another question addressed here concern student attitudes about the use of PowerPoint in traditionally-taught classes compared to those taken through distance education. Is there a difference of opinion about PowerPoint between distance education courses and traditional courses?

Based on current literature, there clearly are several factors involved with determining the overall quality of any presentation developed using software such as PowerPoint. Visual factors, such as color, graphics and layout, along with factors concerning the text, such as the size of the writing and the length of text passages, are considered important. Other items that contribute to the quality of a PowerPoint presentation have to do with the actual content and include the organization of the lecture and the effectiveness of the presentation in facilitating understanding of the subject. In addition, the pace of the presentation, the lighting of the room, and the reliability of the technology also contribute to the overall quality of a presentation. The following factors were selected and have been analyzed in this study:

- Images (Brown, 2000); (Envisioneers, 2001)
- Color (Hanke, 1998); (Johnson, 1992)
- Ability to understand presentation (Envisioneers, 2001); (Nicholson, 2002); (Yiu, n.d.)
- Organization of the lecture
- Size of fonts on slides
- Long passages on slides
- Lighting in the class room (Nicholson, 2002)
- Pace of the presentation
- Technology problems during presentation (Brown, 2000); (Yiu, n.d.)
- SmartBoard availability in the classroom Overall evaluation of PowerPoint (Brown, 2000)
- Overall evaluation of PowerPoint

A *SmartBoard* is a piece of equipment that permits teachers to write electronically on PowerPoint slides, and is now available in many of the better equipped classrooms. Looking similar to a thick white board, the SmartBoard is usually mounted to a wall and becomes the projection screen for a PowerPoint slide show. The SmartBoard permits the teacher to become more interactive, to adjust a lecture, to add additional comments and drawings, and to emphasize certain passages if desired. A related technology called the *Smart Sympodium* is similar to a SmartBoard, but is designed for a larger room. It is not a board to be used as the projection screen, but rather a tablet connected to the instructor's computer on which the instructor can write electronically. This writing is then displayed on a regular projection screen along with the PowerPoint slide. This type of interactive writing technology can also influence a student's attitude toward the PowerPoint presentation, and are addressed below.

The primary purpose of this research is to determine if student opinions about PowerPoint vis-à-vis these factors are positive or negative. This research paper also seeks to answer questions concerning whether there are differences of opinions about each of these factors from students who are enrolled in distance based courses as opposed to student opinions in a traditional classroom setting.

RESEARCH METHODOLOGY

After an extensive library and Internet review of student evaluations of courses using PowerPoint, a questionnaire was developed that addressed certain issues about using PowerPoint lectures in classes. A five point ordinal response frame from strongly agree to strongly disagree was used to respond to statements concerning students' experiences with PowerPoint presentations used in courses they have taken. The authors did not attempt to limit the students' responses to one experience with PowerPoint presentations because it was assumed that most students had previous experiences in other courses or outside of an educational setting. A "no basis for opinion" response is also included for each statement. Category data were also collected to aid data analysis.

The questionnaire contained the following statements for which hypotheses were tested:

1. Seeing images helps me understand ideas.
2. Color or images add interest to the material.
3. I understand the lecture better when presented using PowerPoint slides.
4. The PowerPoint text on the screen is large enough to read.
5. Long passages of text (3 lines or more) on a PowerPoint slide are easy to read.
6. The lighting in the classroom is bright enough for note-taking when using PowerPoint.
7. The pace of the course when using PowerPoint is appropriate.
8. Technical problems with the computer presentations are distracting.

9. My classroom is equipped with a "SmartBoard" or "ScreenWriter" so that the instructor can write on the slides during class.
10. The use of SmartBoard or ScreenWriter by an instructor during a PowerPoint presentation makes the presentation more effective.
11. Overall, I prefer PowerPoint presentations over strictly lecture classes.

The following hypotheses were tested:

<u>Factor</u>	<u>Hypothesis (H₀)</u>
Images	The distributions for responses to the IMAGES question were normally distributed for distance and traditional classroom settings.
	There is no difference in opinions about Images between distance and traditional settings <u>ceteris paribus</u> .
Color	The distributions for responses to the COLOR question were normally distributed for distance and traditional classroom settings.
	There is no difference in opinions about COLOR between distance and traditional settings <u>ceteris paribus</u> .
Understanding	The distributions for responses to the UNDERSTANDING question were normally distributed for distance and traditional classroom settings.
	There is no difference in opinions about UNDERSTANDING between distance and traditional settings <u>ceteris paribus</u> .
Font Size	The distributions for responses to the FONT SIZE question were normally distributed for distance and traditional classroom settings.
	There is no difference in opinions about FONT SIZE between distance and traditional settings <u>ceteris paribus</u> .
Long Passages	The distributions for responses to the LONG PASSAGES question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about LONG PASSAGES between distance and traditional settings ceteris paribus.

Lighting

The distributions for responses to the LIGHTING question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about LIGHTING between distance and traditional settings ceteris paribus.

Course Pace

The distributions for responses to the COURSE PACE question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about COURSE PACE between distance and traditional settings ceteris paribus.

Technical Problems

The distributions for responses to the TECHNICAL PROBLEMS question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about TECHNICAL PROBLEMS between distance and traditional settings ceteris paribus.

SmartBoard

Help The distributions for responses to the SmartBoard question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about SmartBoard between distance and traditional settings ceteris paribus.

Overall View

The distributions for responses to the OVERALL VIEW OF POWERPOINT question were normally distributed for distance and traditional classroom settings.

There is no difference in opinions about OVERALL VIEW OF POWERPOINT between distance and traditional settings ceteris paribus.

The data from the questionnaires were entered into Number Cruncher Statistical System (NCSS) and analyzed. The methods used to evaluate these data were mostly frequency distributions, skewness tests, Mann Whitney U Test, and Kolmogorov-Smirnov analysis.

FINDINGS

The questionnaire was posted on a web site and students taking classes in Oklahoma and Louisiana universities were invited to participate in the survey. One hundred forty two useable responses were obtained.

Respondents were also asked questions concerning demographics, such as age, gender, and classification. Data were also gathered about whether the course was being taught in a traditional classroom or through a distance learning medium. Finally, an open-ended comments section was provided.

Demographics

The survey included 65 males (45.8 percent) and 76 females (53.5 percent) with one non-response. The average age of the 139 valid responses was 25.93 with a range from 18 years to 59 years. Fifty seven (40.4 percent) of students who responded to the question about whether or not the classroom was equipped with a SmartBoard responded 'yes' and 84 (59.6 percent) responded 'no'. The following table describes the classification of the students included in the study.

Student Classification	Frequency	Percent	Cumulative Percent
No response	1	.7	.7
Freshman	4	2.8	3.5
Sophomore	8	5.6	9.1
Junior	50	35.2	44.3
Senior	65	45.8	90.1
Graduate	13	9.2	99.3
Other	1	.7	100
Total	142	100	

Source: Questionnaires

Table 1: Classification of Students Participating in Study

As can be seen from the data, the responses are useful in describing student opinions in a small university. There is fair representation of gender, age, and student classification as well as those students who have experienced presentations with the SmartBoard technology.

Also, in a summary of whether or not the class was being taken as a distance education course, there were four no responses, 88 students (62 percent) who were taking the class in a traditional setting, and 50 students (35.2 percent) who were taking the course via some distance education medium. This should provide a basis for analyzing whether there is a difference of opinion about PowerPoint presentations between the distance group and the non-distance group.

The following table contains the results of the survey. The question is an abbreviated version of the questions presented above. The Strongly Agree (SA) to No Opinion (NO) response frames included the percent responses in that category for each question.

	Abbreviated Question	SA	A	N	D	SD	NO
1	Images help me understand ideas	57.7	33.1	4.2	3.5	1.4	0
2	Color or images add interest	54.9	33.8	7.0	2.8	.7	.7
3	I understand the lecture better	35.9	36.6	19.0	4.2	3.5	.7
4	Can read text size	31.7	38.7	17.6	6.3	3.5	2.1
5	Long passages are easy to read	12.0	28.9	26.8	21.1	9.2	2.1
6	Lights bright enough for notes	28.2	43.7	13.4	6.3	1.4	3.5
7	Pace course appropriate	24.6	46.5	16.2	7.7	1.4	3.5
8	Technical problems are distracting	16.2	31.0	21.1	19.0	7.0	5.6
9	Smartboard or ScreenWriter	27.5	12.7	8.5	9.9	7.7	33.8
10	Use of Smartboard or ScreenWriter helped	25.4	22.5	9.2	4.9	1.4	36.6
11	Overall evaluation of PowerPoint	43.0	36.6	9.9	4.2	5.6	.7

Source: Questionnaires

Table 2: Frequency Distribution of Responses

This summary of responses shows that they are highly skewed toward the strongly agree and agree response frames. The Table 3 shows the analysis of the factors versus whether the course is distance or traditional. The table indicates (+ or -) the direction of the skew, the probability at which a null hypothesis about a normal distribution is rejected, Kolgomorov-

Smirnov decision about whether to accept or reject H_0 . Further, the Mann-Whitney U test decision is included.

Factor	Distance Skewness	Traditional Skewness	KS Action Probability	Mann-Whitney
Images	+ p .000012	+ p .000000	Accept H_0 .99	Accept H_0
Color	+ p .000038	+ p .000300	Accept H_0 .9946	Accept H_0
Understanding	+ p .018051	+ p .000121	Accept H_0 .5019	Accept H_0
Font Size	+ p .027654	+ p .002223	Accept H_0 .0916	Reject H_0 .02
Long Passages	- p .20 Accept H_0	+ p .15 Accept H_0	Accept H_0 .128	Reject H_0 .036
Lighting	+ p .672 Accept H_0	+ p .000005	Reject H_0 .037	Accept H_0
Course Pace	+ p .476 Accept H_0	+p .008707	Accept H_0 .3366	Accept H_0
Technical Problems	+ p .239144 Accept H_0	- p .851344	Accept H_0 .3628	Accept H_0
SmartBoard Helped	+ p .055408 Accept H_0	+ p .000295	Accept H_0 .24	Accept H_0
PowerPoint Overall	+ p .001921	+ p .000000	Accept H_0 .6589	Accept H_0

Source: NCSS Analysis

Table 3: Analysis of Factors in Study

These data indicate that in most cases the distributions are skewed positively toward the agree responses. Hypotheses about the normality of the distribution of responses for distance courses were rejected for all factors with the exception of the "long passages", "lighting", "course pace", and "SmartBoard" factors. For traditional courses "long passages" factor was the only factor for which a null hypothesis could not be rejected.

The Kolgomorov-Smirnov Analysis about null hypotheses of these factors showed that only the "lighting" factor could be rejected. The Mann-Whitney U test showed that the "font size" and "long passages" factors could have a null hypothesis regarding differences between traditional and distance settings rejected.

Comparison of Distance vs. Traditional for Overall Opinion of PowerPoint

A statistical analysis of the "overall opinion of PowerPoint" and "distance or traditional" revealed that a null hypothesis about this comparison could not be rejected. An analysis of the distributions of the distance vs. traditional responses shows that both distributions are very heavily skewed toward the agree response categories. Evidently, there is no difference in the students' opinion concerning the use of PowerPoint in distance and traditional classes.

An Analysis of the Use of SmartBoard Technology

A statistical analysis was performed comparing student opinions about the overall use of PowerPoint in classes equipped with SmartBoard and those that were not. Both Kolmogorov-Smirnov and Mann-Whitney analyses indicated that a null hypothesis about whether opinions about the overall efficacy of the use of PowerPoint was the same for students who had classes equipped with SmartBoard and those who did not should be rejected. The Kolmogorov-Smirnov analysis indicated that the null hypothesis should be rejected at $p < .03$. Mann-Whitney U indicated that null hypotheses should be rejected at p levels less than .001. Although both distributions were skewed toward the agree classifications, the responses in the "strongly agree" category was much higher in classes that were equipped with SmartBoard than those class that were not. This supports our initial notion that the "screen writer" technology does provide an added benefit to the standard PowerPoint presentation.

Student Comments

These open comments are revealing in that almost all of these respondents were very positive concerning the use of PowerPoint. The responses that are listed below tend to indicate that this group of students thinks that PowerPoint is an effective tool if it is used in conjunction with lectures. However, a few comments did reveal some dissatisfaction with PowerPoint, particularly when instructors did not provide any additional learning activities to maintain students' attention. The following are some responses that were received on the questionnaires.

- "I feel that lecture and hands on learning are superior to PowerPoint presentations."
- "PowerPoint should not be used in place of all lecturing, especially when it involves such technical material."
- "My teacher uses both PowerPoint and the blackboard in class and maintains a good balance between lecture and slides."
- "Dr. Pollacia's usage of PowerPoint helps me acquire a better understanding of the course material."
- "I think that the use of PowerPoint and the smartboards was a great idea."
- "Using PowerPoint presentations in class deter from the inability to read professors' handwriting."

- "I enjoy classes with PowerPoint because I don't have to write a whole lot of notes so I can pay attention."
- "I rated some classes three where I had trouble with the PowerPoint presentations and others where I have not."
- "When the instructor strictly uses PowerPoint the class is boring and attention level is low, but when the instructor adds activities with the PowerPoint it helps as a learning aid."
- "PowerPoint should be used more widely throughout the class."
- "The only problem I have with PowerPoint is that some of the instructors leave the PowerPoint up through the whole lecture and you cannot interact with the class."
- "My name is . . . and I feel that by using PowerPoint to reinforce ideas brought forward in a lecture helps to solidify those thoughts in the student's mind."
- "I prefer traditional classroom lectures to PowerPoint presentations in the classroom. There seems to be less interaction with students and the pace is quickened."
- "PowerPoint slides should not replace lectures. But is definitely an asset to learning."
- "PowerPoint slides should not take the place of the instructor."
- "I am definitely a visual learner and PowerPoint is great for me."

SUMMARY AND CONCLUSIONS

A review of literature led us to believe that students had problems with PowerPoint lectures and presentations, both in the traditional classroom and in classes taught via distance learning. The results in this study do not support this notion. Every question in this study that relates to the use of PowerPoint indicates that student opinion of the use of PowerPoint is positive. Students who responded seem to feel that PowerPoint presentations aided their learning activities. They indicated that the use of colors and images was a positive factor in the use of PowerPoint. They also felt that the lectures were better organized with the use of PowerPoint, and that it helped them understand the material better.

Some of the students felt that there were some distractions to the use of PowerPoint. Namely, technical problems with computer equipment tended to distract from the class presentation. Student comments also indicate that instructors need to provide other learning activities in addition to PowerPoint lectures. Although there are minor differences in opinions between the two groups; there are no significant differences between student opinions of students who are taking the class in a distance environment from those taking the class in a traditional setting.

Overall the use of PowerPoint presentation software is evaluated very highly by the students in this study, and is considered to be a positive contributor to their learning.

REFERENCES

- Brown, C. and R. Kesselring (2000). Going High Tech In The Classroom: Do The Benefits Outweigh The Costs? www.abs.org
- Envisioneers. (2001). Technology in The Classroom: Dr. Tom Litzinger
- Hanke, J.(1998). The Psychology of Presentation Visuals. *Presentations*. 12(5), 42-51.
- Johnson, V.(1992). The Power of Color. *Successful Meetings*. 1(7), 87-90.
- Nicholson, D. T. (2002). Lecture Delivery Using MS PowerPoint: Staff And Student Perspectives At MMU. *Learning and Teaching in Action*. 2002(2) 14.
- Yiu, S. (n.d.). The Advantages and Disadvantages of Using Multimedia In Teaching. Shung Tak Catholic English College

