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## Assessing Library Instruction Assessment Activities

Jim Kapoun

*Minnesota State University, Mankato*

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## **The Use of PowerPoint in the Library Classroom: an Experiment in Learning Outcomes**

*Jim Kapoun*  
*Instruction Coordinator*  
*Library*  
*Minnesota State University, Mankato*  
*Mankato, MN 56001*  
*507-386-2251*

### **Introduction**

For several years I have been using PowerPoint for various library instruction classes. In the spring of 2000 I was asked by a senior undergraduate psychology student (Lynn) to participate in a project she had to complete for her senior research class. She had attended my psychology library instruction class and was impressed with my use of PowerPoint to emphasize major points. Her problem statement to prove was that students learn more from a PowerPoint-enhanced lecture than a lecture with overheads or a traditional lecture. I accepted her invitation and was part of her experiment team.

### **Thesis**

Lynn's project team included her psychology professor, who would be responsible for the final grade, and me. Lynn was convinced that students learn more about the library from a lecture given with PowerPoint than a straight lecture with no visual aids or a lecture using just overheads or a chalkboard. Her first duty was to find out in psychology, education, or computer literature if any similar studies had been done on this thesis. She found no evidence of any study similar to her project. With this in mind, Lynn devised a three-day study where I would give a total of nine lectures; three with no visual aids, three with overheads and/or writing on a chalkboard, and three with PowerPoint including multi-media capability.

### **Literature Search**

I decided to conduct a separate literature search on PowerPoint or use of multi-media and any relationship with library instruction. I found no studies that matched Lynn's search specifically; however, I did find a few articles that addressed the issue of hypermedia in the classroom. Dillon (1998) examines the published findings from experimental studies of hypermedia emphasizing quantitative, empirical methods of assessing learning outcomes. According to Dillon, the benefits gained from the use of

hypermedia technology in learning scenarios appear to be very limited and not in keeping with the generally euphoric reaction to this technology in the professional arena.

He reached these conclusions:

1. Hypermedia affords the most advantage for users in specific tasks that require rapid searching through lengthy or multiple information resources and where data manipulation and comparison are necessary. Outside of this context, existing media are better than or as effective as the new technology.

2. Increased learner control over access is differentially useful to learners according to their abilities. Lower ability students have the greatest difficulty with hypermedia.

3. The interaction of learner style in the use of various hypermedia features offers perhaps the basis of an explanation for the generally confusing results in the literature comparing hypermedia and non-hypermedia learning environments. Specifically, passive learners may be more influenced by cueing of relevant information, and the combination of learner ability and willingness to explore may determine how well learners can exploit this technology (Dillion, et al., 1998).

Rebecca Gatlin-Watts (et al.) commented in their 1999 article that the use of multimedia creates a potential tendency to go overboard with flashy graphics and sophisticated sound that could actually detract from the information being presented. Substituting technology over substance should be avoided. Multimedia must not allow the subject matter to dwindle into entertainment. It is important for the instructor to emphasize that the use of multimedia provides a way of learning. When using interactive multimedia, instructors must exercise vigilance and make sure that every student is getting the comprehensive picture. They cited a Department of Defense study, which revealed that training provided through multimedia is roughly 40 percent more effective than traditional methods with a retention rate that is 30 percent greater and a learning curve that is 30 percent less. Also cited is a study that was conducted by Tim McKee of the Southeastern Chapter of the Institute for Operations Research and the Management Sciences Proceedings, who claimed that 80 percent of students he surveyed agreed that, "The use of PowerPoint increased the value of the course." Moreover, 82 percent of responding students preferred to take a course that uses PowerPoint rather than a course without PowerPoint (Gatlin-Watts, 1999).

Linda Reinhardt, an associate professor of psychology at the University of Wisconsin-Rock County, in Janesville, had her students in Introductory Psychology conduct both library and Internet searches on a topic of their choice to help them compare and evaluate the quality and accessibility of information available through these two sources. They then developed PowerPoint presentations to share their research with the class. Intrigued by the use of PowerPoint and with the help of a college librarian, she developed lectures in PowerPoint. The vast majority of her students (over 80 percent) reported that the PowerPoint presentations support the course content, are easy to read,

make the lectures more organized, help them take notes, do not distract from the content of the lectures, and help to clarify the information. A smaller majority of the students (60 to 79 percent) found that the presentations help them remember the material, make the lectures more interesting, and help them pay attention. On the negative side, students' written comments have led her to be concerned that some students may use the lecture outlines as a substitute for taking notes or even for attending class; that darkening the room to see projected images can induce sleep; and that bulleted slides may be attractive and legible and may help the students know where they are in the presentation, but they are not very stimulating. Moreover, some students become spectators rather than participants in a classroom where the professor "orchestrates" a multimedia presentation (Reinhardt, 1999).

### **The Lecture**

My lecture was to be no more than 15 minutes long. I expressed to Lynn my concern that students in the study may have had me before for other instructional classes, and I wanted to make sure the material I covered did not overlap other classes and possibly influence the project outcome. For example, if I spent time on explaining a certain psychology database, and three students had that lecture in another class, their prior knowledge could skew the test results. The key to success for the project was to make sure that all the students were hearing most of the information for the first time. So I told her I would lecture on a topic that was unique to the university curriculum. My lecture title was "Finding biblical resources in the library," since our university had no course offerings on religion. I organized my lecture into three basic parts: library organization, the reference collection, and resources on biblical information in the reference section. For library organization I covered the basics of Library of Congress Classification system and how one would access resources and read a record from the OPAC. For the reference collection I explained what the collection contained and how one can the OPAC to find specific resources in the collection. Lastly, I explained what items were in our reference collection on "Bible research." Each lecture was identical, using multimedia to emphasize major points. For the lecture only session I repeated major points 4 times with emphasis.

<b>Lecture Points</b>	<b>Overhead/Chalkboard</b>	<b>PowerPoint</b>
LC Classification system	Emphasized the B section on the chalkboard	Slides with sound
Using the OPAC to access reference materials	Overhead of a reference record from our OPAC	Slides with sound & movie
The library's reference collection on the Bible	Overhead of a typed list of the titles in reference and used chalkboard to note special types of books, e.g. concordances, bible versions	Slides with sounds & and animation

### **The Experiment:**

The library instruction room was used for the lecture because of the multimedia capabilities. The session was 30 minutes in length: 5 minutes of introduction conducted

by the student, a 15 minute lecture from me, and 10 minutes for the students to take the quiz. The quiz would be designed by me and have ten questions that related to the lecture with multiple choice or fill in the blank answers. Students would not be allowed to take notes during the lecture. Students would be culled from the eight sections of Psychology 101-102 classes on a volunteer basis. Lynn’s psychology professor suggested that up to 30 extra credit points would be rewarded for participating in the study, 20 for attendance and one point for each question answered correctly on the quiz. Lynn agreed with the proposal. Students would know the title of the lecture but not how the lecture was to be delivered. There were three morning sessions at 10-10:30 a.m., three early afternoon sessions at 1:30-2:00 p.m., and three later afternoon sessions at 4-4:30 p.m. with up to 20 students per session.

The session started with five minutes of introduction by Lynn. On the desks were a pencil and a half sheet of paper with three questions. The student filled out the questionnaire, passed it to her, and kept the pencil.

### **The Questionnaire**

1. Do any of your professors use PowerPoint during their lectures? Yes____ No____
2. Which do you like better (check one):
Lectures using no PowerPoint ____
Lectures using overheads or chalkboard _____
Lectures using PowerPoint ____
3. True or False: You will score better on a test or quiz if your professor uses PowerPoint. _____

Lynn explained that I would be giving the lecture; that no notes could be taken or nor questions asked during the lecture; and that after the lecture a 10-point quiz would be given. Lynn introduced me, and I stood up and gave the lecture in 15 minutes. When I was done, I turned the class over to Lynn, who administered the quiz. She passed out a half sheet of ten questions and told the students they had up to ten minutes to complete the quiz

Day and time of lecture \_\_\_\_\_

1. In the LC Classification system the call number for The Bible-Old Testament: \_\_\_\_\_
2. In the LC Classification system the call number for Christianity is:  
a. BZ b. BA c. BR d. B
3. A key reference source is “ The \_\_\_\_\_ Dictionary of the Bible.”
4. A reference book that compares the Biblical Greek text with the English text is called a \_\_\_\_\_.
5. Which is NOT a version of the Holy Bible?  
a. RSV b. NIV c. King John d. American Standard
6. What is NOT a search term used in a basic Web Pals search?  
a. Keyword b. Keyword Subject c. Call Number d. Exact Title
7. When I search the term “ concordance and bible” I received \_\_\_\_ items.

From the record below identify the following parts:

8. Author: \_\_\_\_\_
9. Publisher: \_\_\_\_\_
10. Subject Heading: \_\_\_\_\_

REF BX4655.8.A88

Attwater, Donald, 1892- The Penguin dictionary of saints. Baltimore, Penguin Books [1966,1965]

362 p. 19 cm.

Christian saints--Dictionaries.

\*\*11. (Non-test question) Rate the lecture below:

Most enjoyable 1-----2-----Average 3 -----4 ----- Not enjoyable 5

When finished the student would hand Lynn the quiz and leave the classroom. If any student did not complete the quiz in the time, she would collect them anyway and mark any incomplete questions as incorrect.

## Results

Observationally, participants appeared interested throughout the course of the lecture irrespective of what session they attended.

Session	# of Students	Type of Lecture
<b>10-10:30 a.m.</b>		
Monday	20	lecture-only
Tuesday	20	chalkboard/overhead
Wednesday	18	PowerPoint
<b>1:30-2 p.m.</b>		
Monday	17	lecture-only
Tuesday	20	chalkboard/overhead
Wednesday	20	PowerPoint
<b>4-4:30 p.m.</b>		
Monday	15	lecture-only
Tuesday	20	chalkboard/overhead
Wednesday	16	PowerPoint
<b>Total attendance</b>	<b>166 students out of a possible 180</b>	

From the 3 questions asked at the beginning of the lecture, 34 of the 166 stated their professors use PowerPoint (20.4%). Overwhelmingly, students liked lectures using PowerPoint over the other choices: 124 for PowerPoint (74.6%), 29 for chalkboard/overheads (17.4%), 13 for no PowerPoint (7.8%). And 158 (95.1%) students indicated they would score better on a test or quiz if the professor used PowerPoint.

Test score results showed that the lecture-only sessions scored the highest and the full PowerPoint presentation scored the lowest, with the chalkboard/overhead sessions slightly in the middle.

## Test Scores of Participants by Lecture Group Designation

Session	Avg. Score	Actual Distribution of Scores from 10 to 0											# of Students
		10	9	8	7	6	5	4	3	2	1	0	
<b>10-10:30 a.m.</b>													
Monday	8.5	9	4	2	2	0	2	1	0	0	0	0	20
Tuesday	7.0	5	6	2	3	1	0	2	1	0	0	0	20
Wednesday	7.3	1	4	5	2	4	1	1	0	0	0	0	18
<b>1:30-2 p.m.</b>													
Monday	8.1	5	3	6	1	0	0	1	1	0	0	0	17
Tuesday	6.4	3	2	5	3	4	1	1	1	0	0	0	20
Wednesday	5.7	1	2	4	3	1	3	2	1	0	0	0	20
<b>4-4:30 p.m.</b>													
Monday	8.5	5	5	1	2	1	0	1	0	0	0	0	15
Tuesday	7.1	3	3	4	2	4	1	1	2	0	0	0	20
Wednesday	6.9	1	2	4	4	1	2	1	1	0	0	0	16
<b>Lecture-only</b>	<b>8.36</b>												<b>52</b>
<b>Chalkboard/overhead</b>	<b>6.83</b>												<b>60</b>
<b>PowerPoint</b>	<b>6.63</b>												<b>54</b>

The morning groups scored higher overall (8.3), and the late afternoon groups scored the lowest (6.6). The highest perfect score total was in the Monday 10 a.m. group with 9, and the lowest occurred in each of the PowerPoint session for each day with 1. The highest average score occurred in the non-PowerPoint session at 10 a.m. and again at 4 p.m. with an 8.5. The lowest average test score occurred at the 1:30 p.m. PowerPoint session on Wednesday with a 5.7. Students rated the PowerPoint presentations lecture with the highest satisfaction and rated the lowest satisfaction with the lecture only (question 11). The difference was, at best, minimal, with an overall rating of 1.3 to 2.3 (enjoyable to most enjoyable).

## Rate the Lecture

(Question #11 Non-test question: Rate the lecture below: Most enjoyable 1-----2-----  
-----Average 3-----4 ----- Not enjoyable 5)

Session	Avg. Rating	Distribution of Actual Ratings from 1 to 5					# of Students
<b>10-10:30 a.m.</b>		1	2	3	4	5	
Monday	2.15	8	4	5	3	0	20
Tuesday	2.30	7	4	5	4	0	20
Wednesday	1.33	12	6	0	0	0	18
<b>1:30-2 p.m.</b>		1	2	3	4	5	
Monday	2.17	5	5	6	1	0	17
Tuesday	1.90	7	8	5	0	0	20
Wednesday	1.25	14	5	1	0	0	20
<b>4-4:30 p.m.</b>		1	2	3	4	5	
Monday	2.60	3	8	4	0	0	15
Tuesday	1.85	8	8	3	1	0	20
Wednesday	1.37	10	6	0	0	0	16
<b>Lecture-only</b>	<b>2.30</b>						<b>52</b>
<b>Chalkboard/overhead</b>	<b>2.01</b>						<b>60</b>
<b>PowerPoint</b>	<b>1.31</b>						<b>54</b>

## Analysis

After the experiment, the three of us looked at the data and Lynn was surprised at the results. Students scored the highest overall when no PowerPoint was used and lowest overall with the PowerPoint presentation. The students themselves were convinced that they prefer PowerPoint and would score higher on a test using PowerPoint. Although the test results findings do not support the hypothesis that the use of PowerPoint enhances learning, neither do they imply that PowerPoint serves no benefit in the classroom. Data does support the assertion that students believe they perform better when PowerPoint is used, and that they enjoy it more. We considered many factors in interpreting the data including the lecture style of the instructor, time of day of the lecture, and the amount of time spent in the learning environment. A pre-test for participants on their knowledge of the subject and their use of technology may have provided some additional insights missed by the limited scope of this experiment. Further, pre- and post-questionnaires asking the participants to rate how well they actually believed they scored on the test may have offered even more pertinent data.

Determining the effects and benefits of using PowerPoint in the classroom is a complex matter, which deserves continued examination. The result of our study showed that a PowerPoint presentation did not enhance the over all test performance of the students. This brings into question the current prevailing educational assumption that the use of multimedia technology enhances learning outcomes. While the study revealed that students prefer a PowerPoint presentation they learn and retain less of the information presented. PowerPoint presentations may not directly influence learning outcomes, but

may well be just one component of many that becomes part of the strategic development process instructors use to improve learner outcomes. One subtle benefit of using multimedia is that it can require active participation on the part of the student, as they must interact as the course changes depth and direction (Gatlin-Watts, 1999).

Other factors deserving consideration include the interplay between individual learning styles and the use of PowerPoint, or the lecture style of the instructor, or the complexity of the material PowerPoint is able to effectively convey without compromising learner outcomes.

### **Works Cited**

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