Student Attitude Towards And Use Of Powerpoint® Slides As Study Guides In Undergraduate Introductory Financial Accounting

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ABSTRACT

This study examines undergraduate business students' attitude towards and use of Powerpoint® slides provided as a supplement to class attendance, textbook reading, and other traditional course resources. A survey of students with six majors (accounting, finance, marketing, management, international business and management information systems) enrolled in the undergraduate introductory financial accounting class in which the instructor provided Powerpoint® slides in addition to traditional course lectures and materials for student use. The students' learning strategies, as self reported in a questionnaire, (Table 7) were compared against class attendance, test performance, and overall course performance. Consistent with several prior studies, this study found little relationship between use of these resources and grades on exams or overall course grades. Further, this study found that students do not view these supplemental on-line resources as a substitute for class attendance.

Keywords: integrated presentation software, Powerpoint®, undergraduate business students, web based instructional platforms

INTRODUCTION

Technology-enabled instructional assistance via the Internet has offered professors a range of options to supplement the traditional classroom experience (Kozub, 2010). Many professors use web based instructional platforms, and integrated presentation software, such as Microsoft Powerpoint® (Yi & Hwang, 2003). Web based course instructional platforms, such as "Blackboard"®, "Course in a Box"®, "Desired to Learn"®, and "ECollege"®, has made it easier to design/create web based courses that adjust to individual learning styles and preferences Kozub, 2010). Professors intend to improve learning outcomes, make courses more relevant and interesting, and allow for more efficient delivery of course content. What extent that technology-enabled courses improve student performance is controversial and subject to debate. The prior literature on this subject was found to contain mixed results. One explanation for mixed results may be found in a statement by Tufte (2006) in which he said that "the core ideas of teaching are contrary to the cognitive style dimension of Powerpoint ®, explanation, reasoning, finding things out, questioning, content, and evidence." In apparent support of Tufte, there is a growing amount of studies indicating that enhancements via web based instructional platforms result in no significant improvements in either students' performance or satisfaction Kozub, 2010). This study addresses whether the providing lecture outlines on Powerpoint® slides, as a supplement to classroom lectures and discussions, enhance student performance on exams and the course. In addition, this study investigates any relationship which may exist between usage of this resource and class attendance and participation. Many professors are concerned with whether web based instructional platforms, and integrated presentation software, such as Microsoft Powerpoint ® slides improves or detracts from the students' performance, class participation and attendance. To address these issues, the main research questions addressed are:

- Do students utilize instructor-supplied web based Powerpoint ® slides, and to what extent?
- Do Powerpoint ® slides usage affect exam and course grades, and to what extent?
- Is the reliance on instructor-provided Powerpoint ® slides considered a substitute for class attendance and participation?

PREVIOUS RESEARCH

Various types of supplemental technological resources beyond textbooks, class lectures, and participation have been the subject of a number of previous studies. Supplemental resources may include instructor-provided lecture notes and other tools associated with web based instructional platforms, and integrated presentation software, such as Microsoft Powerpoint ®. Analysis of prior literature was found to have mixed results. In this study, Powerpoint ® slides are considered as an additional, not substitute, resource for students. What is unique about this study is it attempts to understand how students use archived web based Powerpoint ® slides as study guides, while past studies have investigated the effect of Powerpoint ® slides and other enhancements on students' classroom performance. Such studies illustrated the perceived value of Powerpoint ® slides or other enhancements to students, as well as guiding our understanding of the relationship between Powerpoint ® slide usage and exam performance. There are great variations in the results of the previous studies.

Moreno and Mayer (2000), in a study of psychology students, concluded that Powerpoint ® presentations had a negative effect on student performance. Rankin and Hoaas (2001) found Powerpoint ® presentations to have "no significant effect in terms of student performance." Daniels' (1999) study of economics students suggested that use of Powerpoint ® slides was not a significant predictor of classroom performance. In this study, the students perceived that the Powerpoint ® slides were beneficial in a survey concerning the students' views toward the Powerpoint ® presentations, and a majority of the students preferred the presentations. This perception was again reported by Susskind (2005). Kozub (2009), however, found no significant relationship for the Powerpoint ® presentations and other enhancements, but found a significant correlation between online test scores and likeability scores.

In 1999, Lowry found that Powerpoint ® slide lecture guides did significantly increase the student examination scores. Mantei (2000) investigated the use of Powerpoint ® handouts before class, and also found that exam scores were higher with the use of Powerpoint ® slides. In this study Mantei was investigating Powerpoint ® slides as a study guide rather than as a presentation aid. Another study investigated the use of online study non-credit questions as a preparation for actual tests and quizzes. The results showed that those students who voluntarily took advantage of these practice questions scored higher in actual exams and quizzes (Grimstad & Grabe, 2004). In a similar study (Grabe, 2005), provided the students with lecture notes via a course Website. There was some evidence that students who utilized these notes scored better on exams than those who did not. There were no significant differences between the students who reported that they printed out these notes and brought them to class to use during lectures, and those who merely used the notes as a supplemental study aid. There was also some evidence that students who used these notes had lower attendance in class than those who did not.

An important study examining the efficacy of digital Powerpoint ® lecturing in undergraduate classrooms found that students exposed to either Powerpoint ® slides, Powerpoint ® slides with lecture notes, or traditional lectures showed no significant differences in test scores (Szabo & Hastings, 2000). Szabo and Hastings results were substantiated in a more complex study by Barnett (2003), in which students were placed into groups that were given different materials. The first group received an instructor-provided skeletal outline of lecture notes. The second group received detailed lecture notes. A third group were not given an outline or the detailed lecture notes and had to rely on their own notes taken during lectures. The results showed that the students in the first group, which received the supplemental lecture outline, scored higher on exams than those who were provided with complete lecture notes. Surprisingly, there was little difference between those who received notes in outline form and those who relied on their own lecture notes. Szabo and Hastings findings were again substantiated by Kozub (2009) even with enhanced Powerpoint ® slides online.

A study by Weatherly, Grabe, and Arthur (2002-2003) compared one class which was provided with supplemental lecture notes on Powerpoint ® with a class which relied entirely on class lectures and their own notes.

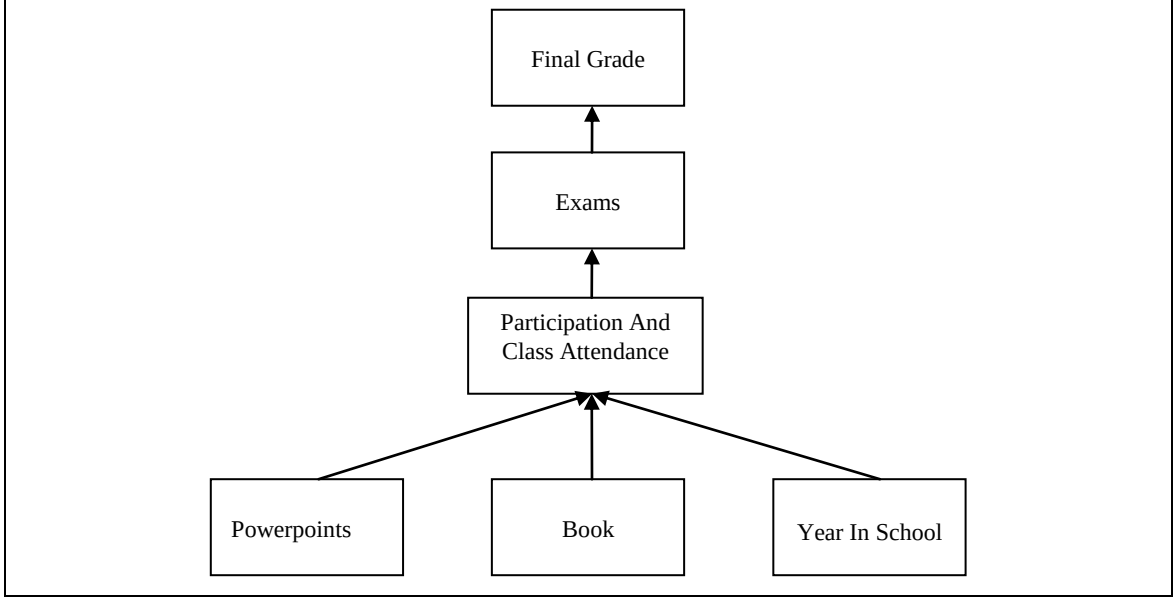
The results found that those without the additional Powerpoint ® slides scored significantly higher on exams than those who had them. The study also found that class attendance of the class which was provided with supplemental lecture notes was lower than those who only relied on class lectures.

Similar results were found in a study in which students provided with supplemental Powerpoint ® lecture notes were ranked from high to low in technology use and high to low in class attendance (Debevec, Shih, & Kashyap, 2006). Several conclusions resulted from this study. First, the results suggested that the majority of students relied more on the Powerpoint ® lecture notes than on a textbook review as preparation for exams. There, however, appeared to be no significant relationship between technology usage and class attendance. Finally this study found no significant difference in exam scores between those who prepared using the Powerpoint ® lecture notes and those who used traditional methods of reviewing the textbook chapters and their lecture notes. In a similar study, Harknett and Cobane (2007) found that over 80% of the students they surveyed felt that Powerpoint ® slides were beneficial, while only 3% said they were not helpful.

RESEARCH MODEL AND METHODOLOGY

After reviewing the literature on the utilization of Powerpoint ® lecture notes in comparison to reliance on a textbook and student taken class notes, an idea formed a proposed model (Figure 1) attempting to explain the linkage between students' reliance on downloaded Powerpoint ® slides and their final grades. It was hypothesized that students' participation in class and attendance would be related positively to their year of study, and would also be positively related to their use of their textbook and downloaded Powerpoint ® slides. Class attendance and participation is a critical variable affecting a student's success in examinations and ultimately affecting a student's final grade.

Figure 1: Proposed Model



This study was conducted in the Lubar School of Business at the University of Wisconsin-Milwaukee (enrollment approximately 25,000 students), a public comprehensive university (Carnegie classification: Doctoral, Research Intensive). Five-hundred and five students in four sections of the undergraduate introductory financial accounting class, mass lectures, were asked to participate in this study, and four-hundred and ninety-eight students began their participation. Eventually eighteen of these students dropped the course for various reasons leaving four hundred and eighty students. Their course of study ran the gambit of majors in the School of Business, accounting, finance, international business, marketing, management, and management information systems. The four-hundred and eighty students completed a one-page questionnaire (Table 7). A seven point Likert-type scale was used with

the responses ranging from strongly disagree, disagree, slightly disagree, neither agree or disagree, slightly agree, agree, and strongly agree. This questionnaire was adopted from a similar instrument used by Debevec et al. (2006). It was made very clear to the students that participation was purely voluntary and that results would be held in the strictest of confidence. The questionnaire was administered by a student helper not in the class, and the students were assured that their responses individually would never be shown to anyone else except the author for data entry purposes. It was also stated that the course instructor may, at the instructor's option, see the completed analysis, but not the individual responses. The students were given the option to see the resulting paper if they wished. Only a very small number of students took advantage of this option. The questionnaire asked the students to respond to fourteen questions concerning their Powerpoint ® utilization, textbook utilization, test preparation techniques, note taking, and class participation. Students were also queried on major area of study, gender, and year of study. Results were then correlated with individual students' grades in the course in the realm of attendance/class participation, exam scores, and overall course grade.

There were 234 male students (48.75%) and 239 females (49.80%), with 7 students (1.42%) not responding (See Table 1). The class used in this study is a sophomore level course, there were juniors and seniors enrolled in it. There were 230 sophomores (47.9%), 211 juniors (43.9 %) and 34 seniors (6.95%), with 5 students not responding (1.04%) (See Table 2). The primary audience for the class, Introduction to Financial Accounting, is business majors, however, 13 of the subjects (2.7%) were non-business majors. Of the remaining students, the largest group (128) was accounting majors (26.7%), 68 finance majors (14.2%), 111 management majors (23.1%), 7 international business majors (1.5%), 50 management information systems majors (10.5%), and 89 marketing majors (18.5%). The remaining students were dual majors with 6 accounting and finance majors (1.3%), 7 were accounting and management information systems majors (1.5%), and only one student was a management and finance major (.2%)(Table 3). All 480 respondents identified their major area of study.

Table 1: Analysis Of Gender Of Participants

Gender	Number	Percentage
Male	234	48.75%
Female	239	49.80%
Did Not Report	7	1.42%
Total	480	100.00%

Table 2: Analysis Of The Year In School Of Participants

Year In School	Number	Percentage
Sophomore	230	47.9%
Junior	211	43.9%
Seniors	34	6.95%
Did Not Respond	5	1.04%
Total	480	100%

Table 3: Analysis Of The Majors Of The Participants

Major	Number	Percentage
Accounting	128	26.7%
Finance	68	14.2%
International Business	7	1.5%
Management	111	23.1%
Management Information Systems	50	10.5%
Marketing	89	18.5%
Accounting/Finance	6	1.3%
Accounting/Information Systems	7	1.5%
Management/Finance	1	0.2%
Non-business	13	2.7%
Total	480	100.0%

RESULTS

The research questions were addressed in the order listed above. The first question was "Do students utilize instructor-supplied web based Powerpoint ® slides, and to what extent?" To address this issue a factor analysis using varimax rotation was performed on the 14 items in the survey to provide information on the underlying structure among a set of variables. The varimax rotation was used since it is "generally considered superior to other orthogonal factor rotation methods in achieving a simplified factor structure" (Hair, Black, Babin, Anderson, & Tatham, 2006). Two distinct factors emerged (eigenvalues greater than 1), as shown in Table 4. They were labeled Powerpoints and Book. Active student learning was shown in factor 1 (Powerpoint) through engagement with Powerpoint ® material. Items 7, 8, and 17 relate directly to students' reported use of Powerpoint ® while item 5 is a more general indicator of active learning by paying attention. The reliability of this construct in terms of internal consistency as measured by Cronbach's alpha ($\alpha = 0.80$). Sufficient reliability is indicated if the coefficient alpha for a set of items is generally accepted if greater than 0.60 (Nunnally & Bernstein, 1994). The mean responses to these questions were 3.72 (item 7), 3.02 (item 8), 3.13 (item 17), and 3.94 (item 5), respectively as shown in Table 4. These scores indicate that a large percentage of the students responded between "agree" to "strongly agree," when addressing these items. Thus, the answer to the first research question "Do students utilize instructor-supplied Web-based Powerpoint ® slides, and to what extent? "are the students' utilizing instructor-supplied Powerpoint ® slides to a considerable extent?

Questions 9, 10, 11, and 12 had relatively high loadings on the second factor labeled Book. Utilization of the textbook, as opposed to reliance on the Powerpoint ® slides, is indicated by the responses to these four survey items. The factor loading for item 11 was the lowest (0.53) of the four items that comprise factor 2, Book. In addition, item 11 did not load higher on any other factor extracted in the varimax solution, and was included in the factor 2 construct BOOK due to the implication that the student is actively interacting with the textbook and other course resources, notes, readings, etc., over time. Factor 2 construct, Book, also exhibits acceptable levels of reliability with Cronbach's alpha ($\alpha = 0.75$). The mean responses to these questions were 3.44, 3.63, 3.98, and 3.66, respectively. This suggests that students favorably view supplemental lecture notes in Powerpoint ® format, but they rely more strongly on the textbook. The correlation coefficient between the two constructs Powerpoints and Book are positive and significant, $r = .240$, $p = .00$ as shown in Table 5. Such a positive and significant correlation coefficient between the two constructs suggests that utilization of the Powerpoint ® resources in conjunction with the textbook affects participation, which was proposed, and also affects exam scores and, ultimately, final grade for the class. This result addresses the second research question, "Do Powerpoint ® slides usage affect exam and course grades, and to what extent?" positively and significantly.

Table 4: Analysis Of The Scores On The Questionnaire

Question Number	Question	Mean	Standard Deviation
5	I pay attention in class:	3.72	1.189
6	I take notes in class	4.09	.992
7	I take notes using the PowerPoint Slides I downloaded	3.02	1.218
8	I download the PowerPoint slides from Web site before class	3.13	1.267
9	I read all relevant chapters in the book before I come to class	3.44	1.002
10	I read all relevant chapters in the book and take special note of the things discussed in class	3.63	1.019
11	I review for a test more than one day before it is given	3.98	1.068
12	I read all the chapters in the book as we go along and review them again before the test	3.66	1.001
13	I review my class notes before the test	4.38	.873
14	I download the PowerPoint slides from the Web site right before a test	3.02	1.256
15	I take practice quizzes on the Web site before the test	3.55	1.133
16	I review the PowerPoint slides before the test	4.50	.609
17	I think that the PowerPoint slides reinforce what my instructor presents in class	3.94	1.040
18	I think that the PowerPoint slides replace class lectures	2.63	1.260

The model being used (Figure 1) has positive regression coefficients (Table 5)for Powerpoint, Book, and Year as they affect participation, however, due to the collinearity in the data between Powerpoint and Book, a closer look at the relationships in isolation is necessary to get a sense of underlying patterns in the data. Looking at the direct effects of Powerpoint, Book, and Year on Participation, the individual effect of each factor is statistically significant, but weak (Table 6). The regression model with Book as a predictor of participation is slightly stronger than that of Powerpoint to Participation (b = 0.2, t = 3.2, p = .002), and this implies that book utilization mediates the effects of Powerpoint and Year on Participation. An important suggestion because of this regression model is that the instructor-provided Powerpoint ® resources are not used as a substitute for class attendance and participation. Thereby, research question #3, "Is the reliance on instructor-provided Powerpoint ® slides considered a substitute to class attendance and participation?" is answered negatively.

Table 5 : Analysis Of Factors Leading To Final Grade

Step 1: Impact Of Powerpoints, Book, And Year In School On Participation					
Factor	**On**	***α***	***b***	***t***	***p***
Powerpoints	Participation	4 items, α = .80	.124	1.8	.07
Book	Participation	4 items, α =.75	.08	1.2	.23
Year In School	Participation		-.025	-.39	.70
The Correlation Coefficient Between Powerpoints And Books: R =.240, P = .00					
R^2 = .03, F =2.063, p = .10					
Step 2: Impact Of Powerpoints, Book, And Year In School On Participation And Participation On Exams					
Factor	**On**	***α***	***b***	***t***	***p***
Powerpoints	Participation	4 items, α = .80	.09	1.52	.13
Book	Participation	4 items, α =.75	-.023	.41	.08
Year In School	Participation		-.11	-1.08	.05
Participation	Exams		.57	10.16	.00
The Correlation Coefficient Between Powerpoints And Books: R =.240, P = .00					
R^2 = .33, F =28.0, p = 0.00					
Step 3: Impact Of Powerpoints, Book, And Year In School On Participation And Participation On Exams Them Exams On Final Grade					
Factor	**On**	***α***	***b***	***t***	***p***
Powerpoint	Participation	4 items, α = .80	.01	.25	.80
Book	Participation	4 items, α =.75	0.0	.12	.01
Year In School	Participation		-.05	-1.38	.17
Participation	Exams		.18	4.1	.00
Exams	Final Grade		.72	16.9	.00
The Correlation Coefficient Between Powerpoints And Books: R =.240, P = .00					
R^2 = .70, F =107.4, p = .00					

It is important to note these direct effects because of the collinearity in the data, thus Table 5, step 2 results are somewhat misleading in terms of effects of Powerpoints, Book, and Year on Participation with coefficients for Book and Year are negative. The most important finding is the strong relationship between Participation and Exams, as expected. For the sake of completeness, all constructs were kept in the model for the next step of analysis to note the path between Exams and Final Grade. Participation is shown as strongly affects Exam Scores (t = 10.16, p = 0.00; Table 5, Step 3) which in turn strongly affect Final Grade, which also addressed the third research question.

Table 6: Direct Effects Model Summary						
Dependent Variable	**Independent Variable**	**Adj. R^2**	***F***	***b***	***t***	***p***
Participation	Powerpoint	*0.013*	4.02, $p = 0.04$	0.13	2.23	0.035
Participation	Book	*0.038*	10.112, $p = 0.002$	0.20	3.18	0.002
Participation	Year	*0.024*	6.9, $p = 0.001$	0.17	2.6	0.001

DISCUSSION AND CONCLUSIONS

This study examined four sections of a mass lecture, Introduction to Financial Accounting, class in which undergraduate students are provided supplemental lecture notes in Powerpoint ® from a course Website. Students' responses on their usage of these resources, in addition to traditional course materials, textbooks and class lectures, were then correlated with year of study, individual student grades on class participation and attendance, exams, and final course grades. The results were mixed but primarily indicated little evidence that these supplemental on-line resources significantly influence grades. An issue that was not addressed in this study was whether Powerpoint ® slides could induce student note-taking passivity. Future research might examine how students take in-class notes with and without the provision of web based Powerpoint ® slides and whether the student note-taking process varies with the subject of the course, for example, biology versus accounting.

Additional results of the current study find that the majority of students do not view these supplemental lecture notes as a substitute for class attendance or participation. This result was found not to be significantly different based on gender, student major, or year of study. Future research might examine whether students in higher level courses still do not view these supplemental lecture notes as a substitute for class attendance or participation. Antidotal evidence suggests a change in a number of students viewing supplemental lecture notes as a substitute for class attendance or participation may change as they approach graduation. Students do like having these resources available, no matter what the degree of reliance they place on them.

Among academics, there has been an ongoing debate about the role and value of downloadable Powerpoint ® slides in a classroom setting. This study reinforced the findings of a number of earlier researchers including Szabo and Hastings (2000), Barnett (2003), Bartsch and Cobern (2003), Weatherly, Grabe, and Arthur (2002-2003), and Debevec, Shih, and Kashyap (2006). Whether Powerpoint ® slides and other on-line or multimedia supplemental teaching aids really have any measurable positive or negative influence on student performance or class attendance/participation is still a subject for debate and exploration. Yet, students have found Powerpoint ® slides to be a preferred presentation method (Daniels, 1999 and Susskind, 2005).

Table 7: The Survey Instrument

Dear Student:

Thank you for agreeing to participate in this research study. The aim of this study is to determine how students utilize Powerpoint slides provided on a course website. All data will be stored in a secured place, inaccessible to others.
Your name is being asked for to correlate your course grade to your responses, and you can be assured that it will not be used for any other purposes. Confidentially and anonymity will be assured through the assigning of a number to each participant when the data is entered for statistical analysis. Thank you for your participation.

Question 1: What is your name? Please Print _____
Question 2: What is your gender? Male ____ Female ____
Question 3: What year are you in school? Freshman ____ Sophomore ____ Junior ____ Senior ____
Question 4: What is your major? For dual majors list both. Please Print.
_____
Question 5: I pay attention in class:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 6: I take notes in class:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 7: I take notes using the Powerpoint Slides I downloaded:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 8: I download the Powerpoint slides before class:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 9: I read all relevant chapters in the book before I come to class:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 10: I read all relevant chapters in the book and take special note of the things discussed in class:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 11: I review for a test more than one day before it is given:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 12: I read all the chapters in the book as we go along and review them again before the test:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 13: I review my class notes before the test:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 14: I download the Powerpoint slides right before a test:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 15: I take practice quizzes on the web site before the test:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 16: I review the Powerpoint slides before the test:
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 17: I think that the Powerpoint slides reinforce what my instructor presents in class.
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )
Question 18: I think that the Powerpoint slides replace class lectures.
Strongly Disagree ( ) Disagree ( ) Slightly Disagree ( ) Neither Agree or Disagree ( ) Slightly Agree ( ) Agree ( ) Strongly Agree ( )

AUTHOR INFORMATION

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