

INFORMATION SYSTEMS EDUCATION JOURNAL

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A Longitudinal Study Assessing the Microsoft Office Skills Course

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Abstract

This paper explains a four-year longitudinal study of the assessment process for a Microsoft Office skills course. It examines whether there is an increase in students' knowledge based on responses to pre- and post-surveys that asked students to evaluate how well they can do particular tasks. Classical classroom teaching methods were used in the first two years of the study; computer-mediated learning plus classical methods were employed in the last two years. The study further examines whether that change to computer-mediation made a difference in student learning. It also examines whether students retain the knowledge as measured by entrance surveys in a follow-on course. Results indicate that the course does make a difference in student learning of Microsoft Office skills. Results also indicate that computer-mediation does appear to make a positive difference in the mastery of Microsoft Office skills in the basic computer skills course although computer-mediation did not make a positive difference in retention of that mastery at the beginning of the follow-on course.

Keywords: course assessment, Microsoft Office skills, pre-post survey, computer-mediated learning

1. INTRODUCTION

Assessment is a critical success factor for higher education institutions which expend increasing efforts to evaluate effectiveness of programs within the institutions and courses within those programs. This paper looks at assessment of a Microsoft Office skills course in a western U.S. public university. For decades, the course has been taught by classical instructor presentation

plus supervised lab sessions. In the last two years of the study, computer-mediated instruction was added, specifically using SAM 2007 from Course Technology Cengage Learning, a web-based content delivery and student assessment tool.

The range of skills that students are expected to master in such a course is extensive. One challenge with assessing such a broad set of

skills is the large amount of instructors' time required to evaluate and measure the skills if each student was to demonstrate each skill individually to the instructor. Moreover, if the goal is to measure whether the course helps students to develop skills, the measurement needs to be both at the beginning and end of the course. Hence, the instructors' time to do the assessment doubles.

Consequently, a decision was made to conduct the assessment by simply asking the students at the beginning and at the end of the class whether they possessed the set of skills. Half-way through the four-year study, another decision was made to augment the class with computer-mediated delivery, specifically using SAM 2007 from Course Technology Cengage Learning. This study, therefore, is able to measure not only whether the course accomplishes its goals to improve student learning of Microsoft Office skills but also whether the computer-mediation tool has any significant impact on student perceptions of their skills mastery. An additional decision was made in the last semester of this study to assess incoming students in a follow-on course, allowing this study to measure retention of the Microsoft Office skills.

2. LITERATURE REVIEW

A full review of the assessment literature could fill several pages and is beyond the scope of this paper. These authors assume that the need for course assessment is understood by informed members of the academic community who are the intended audience of this article. Rather, attention is briefly focused on aspects of the particular form of assessment used in this study.

Accrediting organizations specify the need to demonstrate appropriate assessment (e.g., HLC, 2012) and explain acceptability of course-embedded measurement while strongly encouraging outcome-based assessment (e.g., AACSB, 2012). Roberson, Carnes & Vice (2002) promote assessment based on required student competencies. Palomba & Palomba (1999) include pre-post tests in their list of several commonly used assessment tools. Other scholars (e.g., Rockman & Smith, 2005) have commented on the need to assess computer technology literacy in higher education. This study incorporates all the above concepts and techniques.

3. RESEARCH QUESTIONS

Questions this study attempts to answer are:

1. Does the course help students build Microsoft Office skills? This is measured by comparing post-survey scores to pre-survey scores in the four-year study.
2. Prior to using the computer mediation, did the course help students build Microsoft Office skills? This is measured by comparing post-survey scores to pre-survey scores for the first two years of the study.
3. Does the use of computer mediation improve on the students' building of Microsoft Office skills? This is measured by comparing post-survey scores to pre-survey scores in the last two years of study.
4. Are there significant differences in learning using computer mediation in the basic Microsoft Office skills course versus only the use of traditional classroom instruction? This is measured by comparing results from the first two years of the study to results from the last two years of the study.
5. Do students retain skills beyond the course? This is measured by examining the entrance exam of a follow-on advanced computer skills course that some of the students take.

4. METHODOLOGY

A Microsoft Office skills class is a required course in the Bachelor of Business Administration program at a western U.S. public university. The course is also an elective in the general education program and is a required course in programs such as culinary arts, nursing, and sports administration. Approximately 70% of the students are majors in business disciplines.

Over eight semesters and one summer term, a pre-survey was conducted in the first week of several sections of a Microsoft Office skills class and a duplicate post-survey was administered in the last week. The survey contains questions about 97 Microsoft Windows and Office skills, each with the same 1-5 Likert Scale answers, anchored by "1. I have never done that" and "5. I have frequently done that." The questions on the survey are paraphrased in the 97 items in Table 1 (see Appendix). The surveys were not graded, but students received a few extra credit points for participating.

During those four years, 1062 students took the pre-survey and 786 students participated in the post-survey. The first number is roughly the count of students who enrolled in the class. The difference between the two counts is due to at least three factors. First, several students did not complete the class. Moreover, a few students are likely to have concluded that the points they receive for the post-survey at the end of the semester would not positively impact their grades. However, the biggest cause of the difference most likely was instructors forgetting to remind students to take the post-survey.

The survey was conducted on paper in the year prior to the start of this study. However, those results were not retained. In the first year of this study, some surveys were administered on paper, but most were administered via the university's web-based class support tools (WebCT & D2L). Survey data was stored in an Excel spreadsheet in order to produce the results displayed in the Appendix. Surveys done on paper were manually added to the Excel spreadsheets. Subsequently, data were analyzed in SPSS to determine significance at the .05 level.

To answer the fifth question, i.e., whether students retain skills from the first skills course to the next following course, a separate survey was conducted in the Spring 2012 semester in that follow-on course. Several questions were asked of 118 students at the beginning of the semester. Eighteen of those questions were measured on a Likert scale similar to the one on the pre-and post-surveys in the Microsoft Office skills course. Students also were required to take an entrance exam to demonstrate Microsoft Office skills. Those data were tabulated into an Excel spreadsheet and subsequently analyzed in SPSS to determine significance at the .05 level.

5. FINDINGS

General

From Figure 1 (see Appendix) one can see that students come into the Microsoft Office skills course with varying levels of knowledge in the differing categories of computer skills. That is also anecdotally reported to instructors of the Microsoft Office skills course. They know more about some aspects of using Windows, browsers, Word, and PowerPoint than they know about most aspects of Excel and Access. Even in the aspects where they have greater

knowledge, their knowledge drops off as the specific skills become more advanced.

An important question to answer before statistical analysis is performed is whether the perception of the students in the first two years of the study regarding their Microsoft Office skills is statistically equivalent to the corresponding perceptions of students in the last two years of the study as measured by the pre-survey. Statistical equality would allow the researchers both to group the two sets of students together to compare pre- and post-survey scores and to separate the two groups in order to compare their improvement. This is important in answering some of the five research questions.

Those two groups of students were compared statistically. In Table 1 (See Appendix), the column labeled "C:E" compares the pre-survey scores of students in the first two years to those in the last two years. Of the 97 questions, only 10 had p-Value less than .05. Of those, only two questions were in the Microsoft Office groups, while the other eight questions dealt with Windows, browsers and file management. Those findings would indicate that the two groups of students' perceptions of their Microsoft Office skills prior to completing the course are similar. Therefore, the groups can be compared and combined in the subsequent analyses.

An important indication that one can infer from Figure 1 is that students' comfort level with Office skills decreases as the skills become more advanced. That is to say, students are more comfortable with simpler Excel skills than advanced ones. They are more comfortable with Excel skills in general than they are with most Access skills. These readings match the visual implications from Figure 2 which is based on the surveys in the follow-on computer skills class: If students were less capable with advanced Excel and most Access skills coming out of the Microsoft Office skills class, they should be expected to be similarly less comfortable going into the follow-on class.

Research Question 1

Also from Figure 1, the chart shows that students do indeed gain value from taking an Office skills course. Improvement is shown in a majority of the specific skills areas. This is encouragement that starts to answer the first research question in the affirmative. Greatest

improvements are in shown in Excel and Access topics. However, none of the average scores rise to the level of 5 that the faculty desire.

Obviously, reliance upon visual clues from Figure 1 can be misleading. Thus these authors examined the data statistically to determine if statistical significance exists between the various pairs of means. The right-right hand columns of the eight pages of Table 1 show the result of statistical analyses of independent samples t-tests at a level of significance of $p < 0.05$.

The first of those right-hand columns in Table 1, labeled A:B, compares the responses of all pre-survey takers to the responses all post-survey takers which would be a potential indicator as to whether the computer skills course makes a difference in students' computer skill levels. On all 97 questions, there is a positive difference between pre- and post-survey means, indicating that students reported more comfort with skills on the post-test survey. All but five of these differences in average responses are statistically significant. That causes the authors to conclude that the computer skills course does indeed make a difference. Of course, the authors would prefer to see all the post-survey responses at a level of 5, but the results do indicate that the computer skills course is accomplishing its goals. This answers the first research question.

Research Questions 2 and 3

Columns C and D of Table 1 show the means for all pre- and post-survey takers prior to computer mediation, while columns E and F show those for students after computer mediation. For each of the two groups, C to D and E to F, there is a positive difference for all 97 questions when comparing the pre- and post-surveys. This means students reported more comfort on the post-test survey for each instruction method.

In the right-right hand columns of Table 1, the second (C:D) and third (E:F) columns give a similar pre-post comparison for those who took the course before it became computer mediated and after it became computer mediated. In the C:D column there are only five items for which the pre-post differences in the averages of student responses are not statistically significant. In the E:F column there are only six items for which the pre-post differences in the averages of student responses are not statistically significant. Those results cause the authors to conclude that the computer skills

course accomplishes its goals and makes a difference in students' computer skills regardless of whether the course is computer mediated or not. This answers questions 2 and 3.

Interestingly, the timing of the transition to computer mediation corresponds to a state requirement that all high school graduates must take a computer skills course. It would appear that that rule might not have made a difference. However, the survey in this study was not designed to measure that and any formal conclusion is beyond the scope of this paper.

Research Question 4

The fifth (D:F) column compares the post-survey responses of prior to and after computer mediation. For more than half (53 of 97) of the items, there is a statistically significant difference in the post-survey responses for the two groups. In the case of 43 items, the students who took the course after computer mediation was added were statistically significantly higher than before computer mediation. Only 10 items had statistically significantly lower responses for the students who completed the computer-mediation.

A closer examination indicates that the computer mediation had higher means for the most advanced Microsoft Office skills level in the course. The authors do not believe that this is conclusive to answer question 4 in the affirmative. Although computer mediated instruction is more effective for the advanced skills, there is no definitive answer to the fourth research question that computer mediation does indeed make a difference in the delivery of a computer skills course. Further study is needed to conclusively answer this question.

Research Question 5

For indicators as to whether students retain information from a Microsoft Office skills course, one turns to Figure 2 (See Appendix). From the latter line chart, one can arrive at the following conclusions.

As would be predicted, those who never took the basic Microsoft Office skills course did less well on the entrance test and survey than the average for all students. Oddly, the averages of those who took the course prior to 1995 before it was truly a basic Microsoft Office skills course varied more than the average for all students. Since there are only four in that category, those

results are most likely meaningless. Since those four are non-traditional students who have been in the workforce for some time, on-the-job experience with Excel and Access probably trumps whatever they learned through courses. For all but one question asked, those who took the basic computer literacy course after it became computer mediated rated their comfort level higher than those who took course before it was computer mediated. This is another positive indicator that computer mediation might help students to retain the computer skills from the early course. However, it might simply indicate that the skills have had less time to atrophy. Moreover, the small number of students in that category (21) renders the comparison as less reliable. Further data gathering and statistical analyses are warranted.

Figure 2 has lines not only for all 118 students but also for the 52 who did not take the basic Microsoft Office skills course, the 4 who took the basic course (CISB 101) prior to 1995 when the course was significantly different, the 39 who took the Microsoft Office skills course between 1996 and spring 2010 before it was computer mediated, and the 21 who took it in three semesters after it became computer mediated.

Table 2 presents the results of many independent samples t-tests performed on the data set ($\alpha = 0.05$). There were 108 total tests with nine of them resulting in statistically significant differences in the mean responses.

Column A compared to Column F yielded no difference between the students in the follow-on course (CISB 205) and students who took CISB 101 before 1996 (although n is extremely small for the latter set). This might indicate that students who took CISB 101 before 1996 have been using their skills in the workforce and are returning for more advanced skills training and/or to complete their degree.

Column B (students who took CISB 101 in the traditional format between 1996 and 2010) compared to Column F also showed no difference in the average response to the survey questions.

Column C (students who used computer mediated instruction) compared to Column F yielded a statistically significant difference in the survey result, the comfort level with Access. The students in the computer mediated class show a higher comfort level with Access than do

the students overall (Column F). This indicates that the computer mediated class exposes the student to Access more than (on average) other teaching/learning experiences.

Comparing Column D (students who have never taken CISB 101) to Column F reveals one statistically significant result as well. Students who have never had CISB 101 know much less about Access than does the average student in CISB 205, which is to be expected.

Column E (all students who took CISB 101) compared to Column F illustrates that there is no significant difference between students who took CISB 101 and the students in CISB 205. This could be due to the effect of having the Column E student responses contained in the Column F responses.

Column D (students who never took CISB 101) compared to Column E (all students who took 101) reveals seven statistically significant differences in responses to survey questions. In fact, all students who took CISB 101 rated their familiarity and comfort with the Excel and Access tools higher than the students who never took CISB 101, but significant were: comfort with Access, 3-D cell referencing, relative cell references, conditional formatting, data filters, web page experience, and data tables. It appears that having CISB 101 before CISB 205 is advantageous for the students. This last result also verifies the claim made in the previous paragraph that having both groups in one sample has adverse effects on the results.

6. LIMITATIONS

There are several limitations on this study. First, the ideal situation would have been to perform paired samples t-tests, matching individual students' pre- and post-survey scores. However, that would have required collection of student identifying information which was not recorded when the survey was administered on paper. Therefore, that same practice continued through most of the study despite the student identifying data being easily collected in the electronic survey instrument.

Second, employing a survey to ask students about their skills is not as desirable as directly measuring their skills. In future years, the latter might be employed via the computer-mediated software that was not available in the basic computer skills class when the study began.

Third, there are weaknesses in both surveys in terms of how some questions were asked. The wording was not precise for a few of the questions so the Likert scale anchor answers didn't quite match wording of some of the questions.

Fourth, there is concern as to whether students really know what some of questions mean until after they have taken the basic Microsoft Office skills course. Consequently, a few pre-survey answers might not be accurate, especially for more advanced skills. It is assumed that if students didn't know what the question means, the appropriate answer on the survey would have been "1. I have never done that."

Fifth, the study does not adjust for any confounding factors in order to reduce the bias that they produce. Examples of those other factors are difference in instructor teaching methods or in student demographics. Included is that there was a variable time lapse between students taking the Microsoft Office skills course and the follow-on course during which skills might atrophy.

Sixth, the use of a p-value of .05 to measure the differences between the first and second courses has been questioned by early reviewers who thought an alpha of .05 might produce many false positives. Closer examine of the p-Values given in Table 1 show that a large majority of the differences are statistically significant at the $p < 0.001$ level.

Seventh, these authors do not believe that the data can be generalized to a larger population. The data presented herein is useful and relevant to the authors in their assessment of the course in this study. However, the host institution is unique due to location, history, and the nature of the students that it attracts. Further study at other institutions of higher learning is needed to make a generalization to a larger population.

7. CONCLUSIONS

This paper has suggested that, in most aspects, students entering a college-level Microsoft Office skills course are no more skilled in personal computing in the last two years of the study versus the two years prior to that. Since their beginning skills are similar, the two groups were compared to conclude that the computer skills course does indeed make a difference in the student Microsoft Office skills level. Further,

computer-mediated instruction blended with classroom instruction is more effective than traditional classroom instruction alone in building students' most advanced Microsoft Office skills in most categories of skills and for all Access skills. This paper has also shown that students who completed a basic Microsoft Office skills class are better prepared at the start of a more advanced computer skills course than those who did not take such a class. However, the findings suggest that computer-mediated instruction in the beginning Microsoft Office skills course made no difference in the students' preparation level for the more advanced course and the time lag between the basic Microsoft Office skills course and the advanced computer skills course is immaterial in terms of the students' readiness to take the advanced course.

This paper also points out many flaws of this study. While the findings are encouraging and beneficial for their intended course assessment purpose, they are not generalizable. The studies should be replicated using more refined data collection methods than opinion surveys. Computer mediated instruction could be used to administer pre- and post-tests (rather than surveys) that measure skills rather than attitudes. Such computer mediated measurement would not impact greatly on instructor workloads.

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Appendix

**Figure 1. Results of CISB 101 Pre-Surveys and Post-Surveys
Fall 2008-Spring 2012**

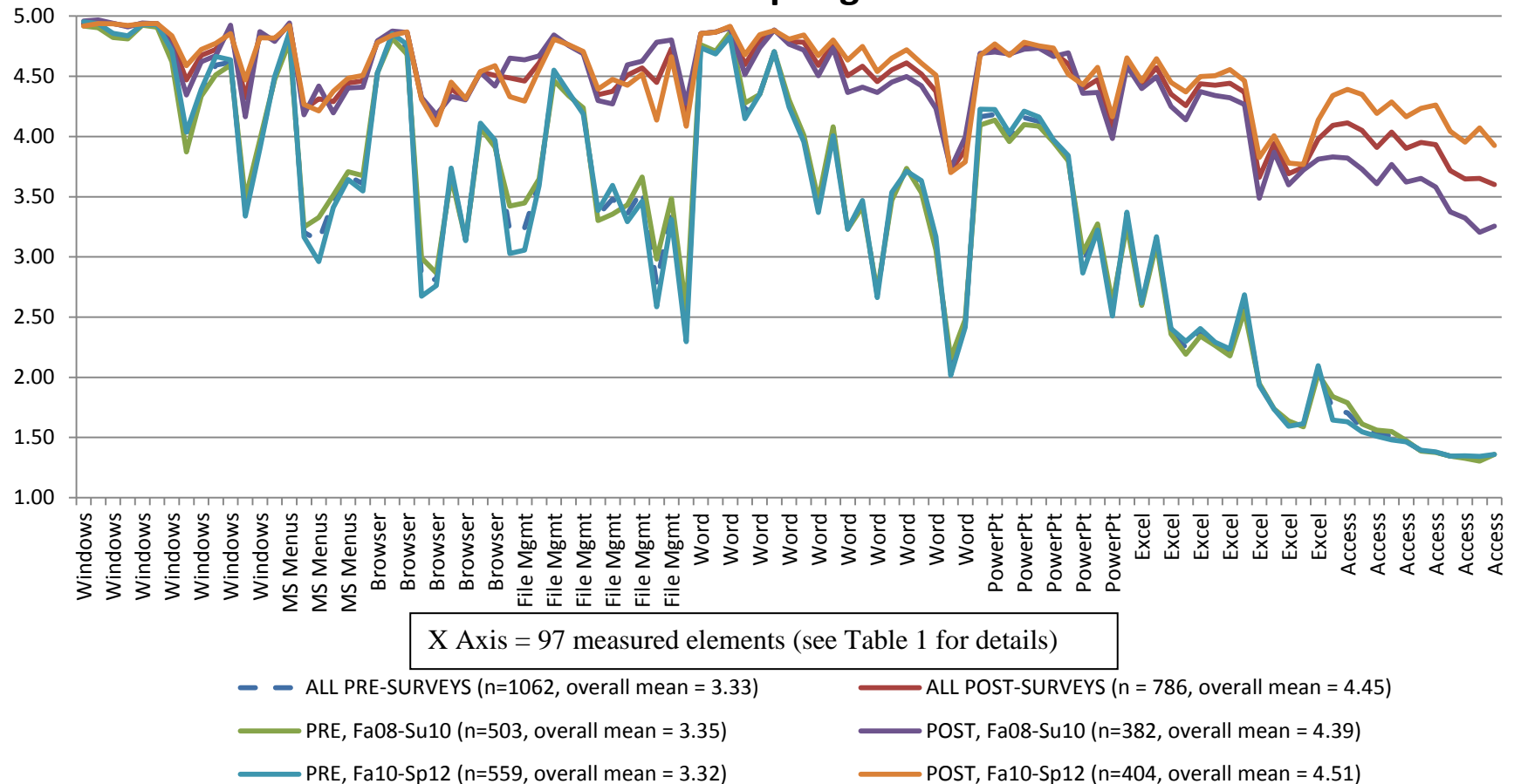


Table 1. Means of Survey Questions and Analysis (page 1 of 8)

Survey Question #	Survey Questions	A All Pre-Surveys	B All Post-Surveys	C Pre-Surveys Fa08-Su10	D Post-Surveys Fa08-Su10	E Pre-Surveys Fa10-Sp12	F Post-Surveys Fa10-Su12	Statistically Significant at p < 0.001? For pairs of columns (Yes or Actual p-Value)				
N/A	N	1062	786	503	382	559	404	A:B	C:D	E:F	C:E	D:F
N/A	Overall means	3.33	4.45	3.35	4.39	3.32	4.51					
1	Turn the computer on and off.	4.94	4.94	4.92	4.96	4.95	4.92	.93	.10	.18	.15	.13
2	Open and close a program.	4.92	4.95	4.90	4.97	4.94	4.94	.07	.01	.97	.15	.19
3	Switch between several open programs.	4.84	4.94	4.82	4.94	4.86	4.94	Yes	Yes	.01	.28	.62
4	Resize and move windows	4.82	4.92	4.81	4.91	4.84	4.92	Yes	.01	.01	.49	.67
5	Use maximize, minimize, close buttons.	4.93	4.94	4.92	4.94	4.93	4.94	.51	.45	.83	.80	.79
6	Use the Start Menu.	4.92	4.94	4.91	4.94	4.93	4.94	.28	.24	.69	.39	.98
7	Find and open accessory programs.	4.67	4.79	4.62	4.74	4.71	4.84	Yes	.02	.01	.06	.03
8	Find topics in the Help menu.	3.96	4.47	3.87	4.34	4.04	4.59	Yes	Yes	Yes	.03	Yes
9	Use the Control Panel.	4.36	4.67	4.34	4.62	4.39	4.72	Yes	Yes	Yes	.39	.049
10	Change screen saver/desktop background.	4.59	4.72	4.51	4.67	4.67	4.77	.01	.01	Yes	.01	.05
11	Easily find files using My Computer.	4.62	4.89	4.59	4.92	4.64	4.86	Yes	Yes	Yes	.36	.04
12	Use Windows Explorer (not IE).	3.41	4.32	3.48	4.16	3.34	4.47	Yes	Yes	Yes	.11	Yes
13	Log onto your account and F: drive folder.	3.93	4.84	3.97	4.87	3.90	4.82	Yes	Yes	Yes	.35	.17
N/A	All Windows questions	4.53	4.79	4.51	4.77	4.55	4.82					

Table 1. Means of Survey Questions and Analysis (page 2 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12					
								A:B	C:D	E:F	C:E	D:F
14	Use the standard tool bar buttons.	4.49	4.80	4.47	4.79	4.50	4.82	Yes	Yes	Yes	.64	.51
15	Cut, copy and paste information.	4.83	4.93	4.79	4.94	4.87	4.92	Yes	Yes	.06	.03	.46
16	Know what "... " means in a menu.	3.20	4.22	3.25	4.18	3.16	4.27	Yes	Yes	Yes	.38	.29
17	Know what grayed-out command means.	3.13	4.31	3.33	4.42	2.96	4.21	Yes	Yes	Yes	Yes	.01
18	Add or remove buttons from toolbar.	3.46	4.29	3.51	4.20	3.41	4.38	Yes	Yes	Yes	.26	.02
19	Move toolbar to show buttons available	3.67	4.45	3.71	4.40	3.64	4.49	Yes	Yes	Yes	.45	.23
20	Display toolbars.	3.61	4.46	3.68	4.41	3.55	4.51	Yes	Yes	Yes	.14	.13
N/A	All Microsoft menus questions	3.77	4.50	3.82	4.48	3.73	4.51					

Table 1. Means of Survey Questions and Analysis (page 3 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12					
								A:B	C:D	E:F	C:E	D:F
21	Navigate the Web.	4.53	4.79	4.53	4.79	4.53	4.78	Yes	Yes	Yes	.99	.74
22	Find a specific web site using its URL	4.84	4.86	4.81	4.88	4.85	4.84	.39	.09	.71	.26	.33
23	Use keywords in a search engine.	4.73	4.87	4.68	4.86	4.76	4.87	Yes	Yes	Yes	.07	.88
24	Understand the four parts of a URL.	2.82	4.32	2.99	4.32	2.67	4.31	Yes	Yes	Yes	Yes	.82
25	Create a correct APA citation	2.81	4.14	2.87	4.18	2.76	4.10	Yes	Yes	Yes	.24	.14
26	Understand copyright laws on Web	3.70	4.40	3.66	4.33	3.74	4.45	Yes	Yes	Yes	.38	.08
27	Find scholarly articles using Library.	3.14	4.31	3.15	4.31	3.14	4.31	Yes	Yes	Yes	.92	.92
28	Bookmark pages; organize favorites.	4.09	4.54	4.07	4.53	4.11	4.54	Yes	Yes	Yes	.61	.90
29	Use Internet Options of a browser.	3.94	4.51	3.91	4.42	3.97	4.59	Yes	Yes	Yes	.46	.01
N/A	All browser questions	3.84	4.52	3.85	4.51	3.84	4.53					

Table 1. Means of Survey Questions and Analysis (page 4 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12					
								A:B	C:D	E:F	C:E	D:F
30	The difference between drives.	3.22	4.49	3.42	4.65	3.03	4.33	Yes	Yes	Yes	Yes	Yes
31	The different types of drives.	3.24	4.46	3.45	4.64	3.06	4.29	Yes	Yes	Yes	Yes	Yes
32	Copy file from one drive to drive	3.62	4.61	3.65	4.67	3.59	4.56	Yes	Yes	Yes	.53	.048
33	Save files in a specific folder.	4.51	4.83	4.47	4.84	4.55	4.81	Yes	.09	Yes	.52	.37
34	Create folders and subfolders.	4.35	4.76	4.34	4.76	4.37	4.76	Yes	Yes	Yes	.65	.88
35	Identify files by their icons.	4.21	4.70	4.24	4.69	4.19	4.71	Yes	Yes	Yes	.48	.69
36	Determine the size of files.	3.35	4.35	3.30	4.30	3.39	4.39	Yes	Yes	Yes	.38	.18
37	Sort files by date or file type.	3.48	4.37	3.36	4.27	3.59	4.47	Yes	Yes	Yes	.01	.01
38	Understand a file pathname.	3.36	4.51	3.43	4.60	3.29	4.43	Yes	Yes	Yes	.13	.01
39	Access the download directory.	3.56	4.57	3.66	4.63	3.46	4.52	Yes	Yes	Yes	.02	.08
40	Turn in homework to your K:.	2.77	4.45	2.98	4.78	2.59	4.14	Yes	Yes	Yes	Yes	Yes
41	Use campus network acct & F:	3.39	4.73	3.48	4.80	3.31	4.66	Yes	Yes	Yes	.05	.01
N/A	All file management questions	3.61	4.57	3.66	4.64	3.53	4.51					

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Table 1. Means of Survey Questions and Analysis (page 5 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12	A:B	C:D	E:F	C:E	D:F
42	Use word-wrap to create paragraph.	2.42	4.18	2.56	4.28	2.30	4.08	Yes	Yes	Yes	.01	.02
43	Use italic, bold & underline format.	4.75	4.86	4.76	4.85	4.74	4.86	Yes	.02	.01	.56	.99
44	Double and triple space lines.	4.70	4.87	4.71	4.87	4.68	4.87	Yes	Yes	Yes	.63	.94
45	Use Spell Check.	4.85	4.91	4.87	4.90	4.83	4.92	.01	.01	Yes	.27	.67
46	Use Word's thesaurus.	4.21	4.60	4.28	4.51	4.15	4.68	Yes	.01	Yes	.10	.01
47	Create bulleted lists/numbered lists.	4.35	4.79	4.35	4.74	4.35	4.85	Yes	Yes	Yes	.96	.01
48	Change type face, color & size	4.70	4.88	4.70	4.88	4.70	4.88	Yes	Yes	Yes	.99	.90
49	Change right and left margins	4.27	4.79	4.31	4.77	4.25	4.81	Yes	Yes	Yes	.37	.33
50	Change the page layout.	3.98	4.78	4.01	4.72	3.95	4.84	Yes	Yes	Yes	.48	.01
51	Create a 2 or 3-column format.	3.42	4.59	3.47	4.51	3.37	4.67	Yes	Yes	Yes	.23	.01
52	Insert graphics and WordArt.	4.04	4.77	4.08	4.73	4.01	4.80	Yes	Yes	Yes	.35	.13
53	Create a multi-column table	3.23	4.50	3.23	4.37	3.23	4.64	Yes	Yes	Yes	.99	Yes
54	Insert, delete, move table rows.	3.44	4.58	3.42	4.41	3.47	4.75	Yes	Yes	Yes	.56	Yes
55	Use section breaks.	2.69	4.46	2.71	4.37	2.66	4.54	Yes	Yes	Yes	.58	.01
56	Center title page with one click.	3.50	4.55	3.47	4.45	3.54	4.65	Yes	Yes	Yes	.50	.01
57	Place automatic page numbers.	3.72	4.61	3.73	4.50	3.71	4.72	Yes	Yes	Yes	.80	Yes
58	Create a running header or footer.	3.59	4.52	3.53	4.42	3.63	4.61	Yes	Yes	Yes	.26	.01
59	Use style to create std headings.	3.12	4.38	3.06	4.23	3.17	4.51	Yes	Yes	Yes	.22	Yes
60	Automatically generate a ToC.	2.08	3.72	2.16	3.73	2.01	3.70	Yes	Yes	Yes	.09	.70
61	Create APA references list.	2.45	3.89	2.48	3.99	2.42	3.79	Yes	Yes	Yes	.46	.02
N/A	All Word questions	3.68	4.56	3.69	4.51	3.66	4.61					

Table 1. Means of Survey Questions and Analysis (page 6 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12					
								A:B	C:D	E:F	C:E	D:F
62	Play a slide show in Power Point.	4.16	4.68	4.09	4.69	4.23	4.67	Yes	Yes	Yes	.09	.72
63	Create slide w/ title & bulleted text.	4.18	4.74	4.14	4.70	4.22	4.77	Yes	Yes	Yes	.27	.17
64	Create slides with differing layouts.	4.00	4.68	3.96	4.69	4.03	4.67	Yes	Yes	Yes	.41	.82
65	Add, delete and move slides.	4.16	4.76	4.10	4.73	4.21	4.78	Yes	Yes	Yes	.17	.22
66	Insert pictures or clip art on slides.	4.13	4.74	4.08	4.73	4.16	4.75	Yes	Yes	Yes	.35	.68
67	Apply a slide background.	3.96	4.70	3.95	4.67	3.97	4.73	Yes	Yes	Yes	.84	.19
68	Use slide transitions.	3.82	4.60	3.80	4.69	3.84	4.52	Yes	Yes	Yes	.62	.01
69	Add auto page # to presentation.	2.95	4.40	3.04	4.36	2.87	4.43	Yes	Yes	Yes	.08	.30
70	Change font on slides using master.	3.25	4.47	3.27	4.37	3.22	4.58	Yes	Yes	Yes	.62	.01
71	Create automatic summary slide.	2.56	4.08	2.61	3.98	2.51	4.16	Yes	Yes	Yes	.28	.04
N/A	All Power Point questions	3.72	4.58	3.70	4.56	3.73	4.61					

Table 1. Means of Survey Questions and Analysis (page 7 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at p < 0.001? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12	A:B	C:D	E:F	C:E	D:F
72	Find a particular cell and type into it.	3.32	4.62	3.26	4.59	3.37	4.65	Yes	Yes	Yes	.28	.23
73	Create correct equations, e.g., =A2*(B2+C2)	2.61	4.43	2.60	4.40	2.62	4.46	Yes	Yes	Yes	.85	.34
74	Insert, delete, move rows or columns.	3.14	4.57	3.11	4.50	3.17	4.65	Yes	Yes	Yes	.55	.01
75	Use fill handle to copy equations.	2.38	4.35	2.36	4.25	2.40	4.45	Yes	Yes	Yes	.62	.01
76	Use fill handle to create a sequence.	2.25	4.26	2.19	4.14	2.30	4.37	Yes	Yes	Yes	.22	.01
77	Use the AutoSum Function.	2.38	4.44	2.34	4.37	2.41	4.50	Yes	Yes	Yes	.49	.06
78	Use ranges in equations, e.g., (A1:A20).	2.28	4.43	2.26	4.34	2.29	4.50	Yes	Yes	Yes	.76	.01
79	Use summary functions, e.g., Min, Max, Avg.	2.21	4.44	2.18	4.32	2.24	4.56	Yes	Yes	Yes	.51	Yes
80	Create a simple bar or column chart.	2.62	4.37	2.55	4.27	2.69	4.46	Yes	Yes	Yes	.14	.01
81	Use powers, such as square root.	1.94	3.66	1.95	3.49	1.94	3.83	Yes	Yes	Yes	.86	Yes
82	Use absolute & relative referencing.	1.74	3.94	1.74	3.87	1.74	4.01	Yes	Yes	Yes	.97	.09
83	Use predefined functions, e.g., FV or PMT.	1.61	3.69	1.64	3.60	1.59	3.78	Yes	Yes	Yes	.51	.04
84	Create a correct IF statement.	1.60	3.75	1.59	3.72	1.62	3.77	Yes	Yes	Yes	.70	.59
85	Create advanced graphs and charts.	2.06	3.98	2.03	3.81	2.10	4.14	Yes	Yes	Yes	.43	Yes
N/A	All Excel questions	2.30	4.21	2.27	4.12	2.32	4.29					

Table 1. Means of Survey Questions and Analysis (page 8 of 8)

Survey Question #	Survey Questions	A	B	C	D	E	F	Statistically Significant at $p < 0.001$? For pairs of columns (Yes or Actual p-Value)				
		All Pre-Surveys	All Post-Surveys	Pre-Surveys Fa08-Su10	Post-Surveys Fa08-Su10	Pre-Surveys Fa10-Sp12	Post-Surveys Fa10-Su12					
								A:B	C:D	E:F	C:E	D:F
86	Open a report or form.	1.74	4.09	1.84	3.83	1.64	4.34	Yes	Yes	Yes	.01	Yes
87	Add, delete, change in table/form.	1.70	4.11	1.79	3.82	1.63	4.39	Yes	Yes	Yes	.04	Yes
88	Create a report or form.	1.58	4.05	1.61	3.73	1.55	4.35	Yes	Yes	Yes	.35	Yes
89	Understand relationship among tables	1.53	3.91	1.56	3.61	1.51	4.19	Yes	Yes	Yes	.44	Yes
90	Add fields to a table.	1.51	4.04	1.55	3.77	1.48	4.29	Yes	Yes	Yes	.27	Yes
91	Create table from field definitions.	1.47	3.90	1.47	3.62	1.46	4.16	Yes	Yes	Yes	.86	Yes
92	Execute a query.	1.39	3.95	1.39	3.65	1.39	4.23	Yes	Yes	Yes	.90	Yes
93	Create a simple field query.	1.38	3.93	1.37	3.58	1.38	4.26	Yes	Yes	Yes	.91	Yes
94	Incorporate summary fields in query.	1.35	3.72	1.35	3.37	1.35	4.04	Yes	Yes	Yes	.99	Yes
95	Incorporate a calculated field in query	1.34	3.65	1.33	3.32	1.35	3.95	Yes	Yes	Yes	.70	Yes
96	Create a main form with a subform.	1.32	3.65	1.30	3.21	1.34	4.07	Yes	Yes	Yes	.45	Yes
97	Create grouped report with headings.	1.36	3.60	1.36	3.26	1.36	3.93	Yes	Yes	Yes	.99	Yes
N/A	All Access questions	1.47	3.88	1.49	3.56	1.45	4.18					

Figure 2. Results of CISB 205 Pre-Surveys, Spring 2012

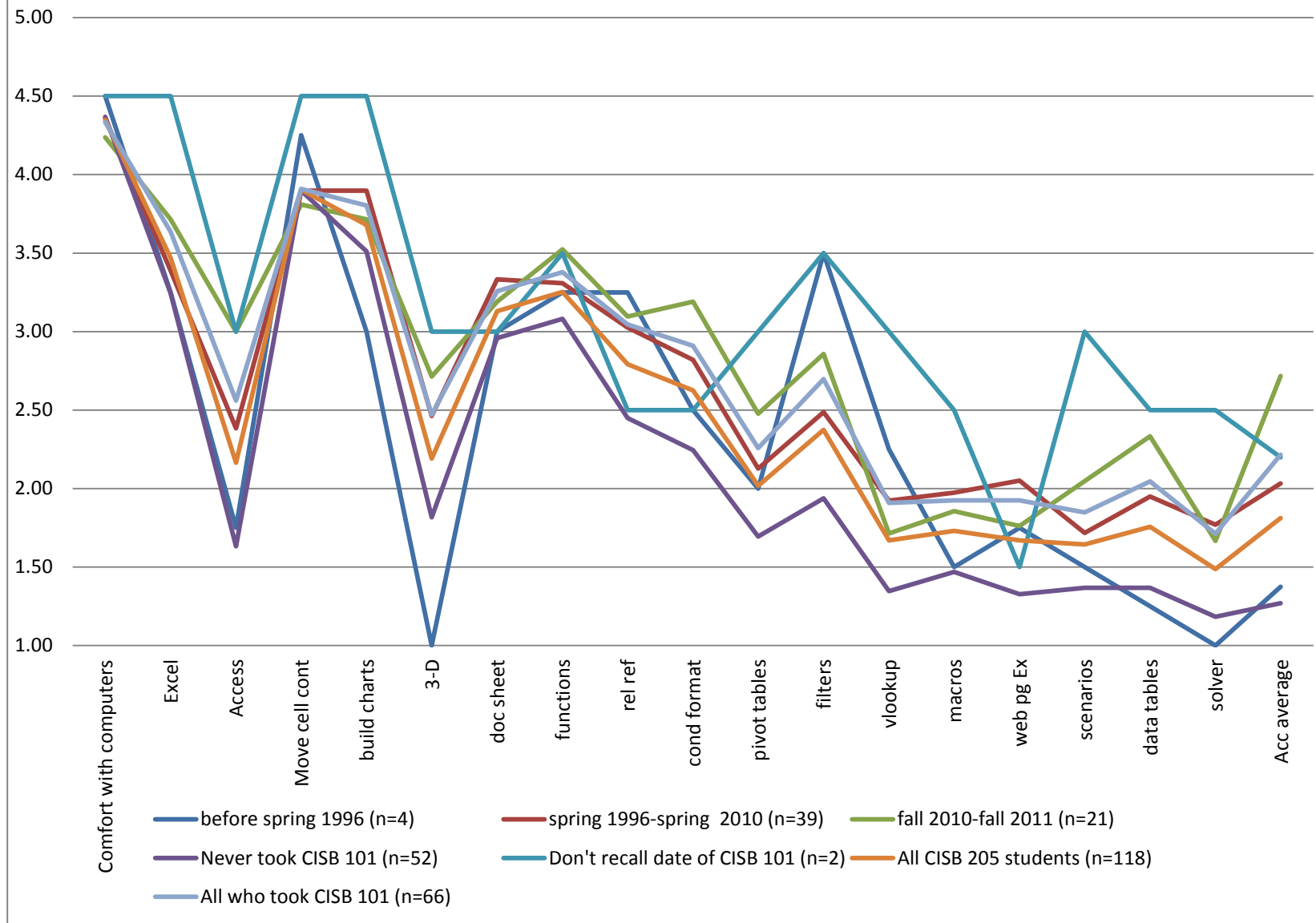


Table 2. Means of Survey Questions and Analysis in Follow-on Course

		A	B	C	D	E	F						
		Year when student took CISB 101				All who took CISB 101	All who took CISB 205	Statistically Significant at $p < 0.05$? For pairs of columns (Yes/No)					
Survey Question #	Survey Questions	Before 1996	Spring 1996-Spring 2010	Fall 2010-Fall 2011	Never								
	n	4	39	21	52	64	116	A:F	B:F	C:F	D:F	E:F	D:E
1	Comfort w/ computers	4.50	4.36	4.24	4.37	4.33	4.35	No	No	No	No	No	No
2	with Excel	3.25	3.39	3.71	3.24	3.64	3.47	No	No	No	No	No	No
3	with Access	1.75	2.38	3.00	1.63	2.56	2.17	No	No	Yes	Yes	No	Yes
4	move cell cont	4.25	3.90	3.81	3.90	3.91	3.90	No	No	No	No	No	No
5	build charts	3.00	3.90	3.71	3.51	3.80	3.68	No	No	No	No	No	No
6	3-D	1.00	2.46	2.71	1.82	2.47	2.19	No	No	No	No	No	Yes
7	doc sheet	3.00	3.33	3.19	2.96	3.26	3.13	No	No	No	No	No	No
8	functions	3.25	3.31	3.52	3.08	3.38	3.25	No	No	No	No	No	No
9	rel ref	3.25	3.03	3.10	2.45	3.05	2.79	No	No	No	No	No	Yes
10	cond format	2.50	2.82	3.19	2.24	2.91	2.63	No	No	No	No	No	Yes
11	pivot tables	2.00	2.13	2.48	1.69	2.26	2.02	No	No	No	No	No	No
12	filters	3.50	2.49	2.86	1.94	2.70	2.37	No	No	No	No	No	Yes
13	vlookup	2.25	1.92	1.71	1.35	1.91	1.67	No	No	No	No	No	No
14	macros	1.50	1.97	1.86	1.47	1.92	1.73	No	No	No	No	No	No
15	web pg Ex	1.75	2.05	1.76	1.33	1.92	1.67	No	No	No	No	No	Yes
16	scenarios	1.50	1.72	2.05	1.37	1.85	1.64	No	No	No	No	No	No
17	data tables	1.25	1.95	2.33	1.37	2.05	1.76	No	No	No	No	No	Yes
18	solver	1.00	1.77	1.67	1.18	1.71	1.49	No	No	No	No	No	No