

COLLEGE FRESHMEN AND SENIORS PERCEPTIONS OF INFORMATION TECHNOLOGY SKILLS ACQUIRED IN HIGH SCHOOL AND COLLEGE

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Abstract

The purpose of this study was to examine the perceptions of college freshmen and seniors' strengths and weaknesses in information technology skills acquired in high school and college. Participants included 134 undergraduate students enrolled in a private college in New York. Descriptive statistics were calculated to determine the percentages of disagreement or agreement for 40 items relating to seven variables that measured information technology skills. Based on median percentages, freshman indicated weaknesses in the ability to sort cells in spreadsheets, access email, group images, create PowerPoint presentations, use tools in a draw document, and not bypass filtering systems. Seniors reported weaknesses in their ability to sort cells in spreadsheets, create a text box in a draw document, add visual effects in PowerPoint presentations, and not bypass filtering systems. Recommendations include modifications in curriculum at the high school and college level to provide better preparation in information technology skills.

Purpose

In an integrated and interdependent technology driven world, proficiency in information technology skills takes on new importance for students' success in college. Today's students are tomorrow's leaders. They are the Internet generation. They can text message, instant message, manage social networks and multitask. It is reasonable to assume that they are the most technologically savvy members of society. But do these social information technology skills transfer to school? Can students manage spreadsheets, share information with colleagues, develop and present PowerPoint presentations, and create written documents using word processors? Do they understand basic computer usage beyond downloading music and on-line chatting? Are they sensitive to the ethical implications of computer usage in a non-personal environment? What are their perceptions of their strengths and weaknesses in information technology skills acquired in high school and college?

The purpose of this study was to examine how freshmen undergraduate students perceive their strengths and weakness in information technology skills acquired from their high school education. And how senior undergraduate students perceive their strengths and weaknesses in information technology skills acquired from their college education. The study builds on the prior research of Brachio (2005) who examined students' perceptions of their information technology skills in the variables of: spreadsheets, general computer use, advanced word processing, sharing information, PowerPoint presentations, basic word processing, and ethical use of computers.

This study was guided by two research questions: 1) how do college freshmen perceive their strengths and weaknesses in information technology skills acquired in high school in the areas of spreadsheets, general computer use, advanced word processing, sharing information, PowerPoint presentations, basic word processing, and ethical use of computers? 2) How do college seniors perceive their strengths and weaknesses in the same skills acquired in college?

Theoretical Framework

In 2001, President George W. Bush signed the No Child Left Behind Act (NCLB) into law. NCLB was created to improve the educational performance of primary and secondary schools in the United States by increasing the standards of accountability of individual state's educational outcomes (U.S. Department of Education, 2005). NCLB was designed to revamp the entire K-12 system by implementing a standards based curriculum. However, the scope of the curriculum is often limited and in many instances only emphasizes main content areas. Left out are what are now considered to be almost ancillary subjects such as vocational studies and information technology (Daggett, 2003).

NCLB required that by the end of 2006 all students should have achieved technological proficiency by the end of the eighth grade. Specifically, the Enhancing Education Through Technology Act of 2001 has a stated goal: "To assist every student in crossing the digital divide by ensuring that every student is technologically literate by the time the

student finishes the eighth grade, regardless of the student's race, ethnicity, gender, family income, geographic location, or disability” (Indiana Department of Education, 2008).

There have been several studies conducted to assess high school and college students' perceptions of how well school has prepared them regarding their competence in information technology. Messineo & DeOllos (2005) measured the reported experience, comfort level, and perceived information technology skills of college students. Their findings indicated that students have different perceptions related to their level of competency contingent on personal use versus school-related use. The findings also indicate a lack of student comfort and overall exposure to advanced applications. Gupta and Houtz (2000) studied the attitudes, perceptions, and biases of high school students towards information technology careers and the skills required for employment. An overall finding showed that access to technology was a critical issue. Cuban (2001), college faculty members are not integrating the technology into their instruction in a way that will benefit student learning. Keengwe (2007) examined the relationship between faculty integration of technology and student's perceptions of the effect that computer technology has on their ability to learn. Keengwe's findings indicate that students lack computer skills regarding a number of technology skills required to enhance their learning experiences.

Data Gathering and Methodology

For the purposes of this study, the survey instrument and data collected by Brachio (2005) was used. The survey included a 5-point Likert scale with 5 indicating strongly agree, 4 indicating agree, 3 slightly agree, 2 indicating agree, and 1 indicating strongly agree. The data was obtained from 134 surveys administered at a 4 year liberal arts college on Long Island, New York with an enrollment of 6,915 students. The survey was juried by seven people to ensure content validity. Part I of the survey included 10 demographic questions and Part II of the survey included 40 items that measured the seven variables. To answer the research questions, data from the survey was entered into SPSS. Univariate descriptive statistics were calculated using the responses from the college freshmen and seniors who completed the survey. Percentages of disagreement or agreement as well as the median for each item were calculated. The Cronbach alpha range of reliability was calculated for all seven variables (Brachio, 2005). The combined percentages of strongly disagree and disagree and strongly agree and agree were summarized to determine the level of disagreement or agreement for each item. The results are presented in (Table 1).

Table 1.
Percentages of Levels of Agreement and Disagreement between College Freshmen and College Seniors

Item#	Item	College Freshmen		College Seniors	
		Disagreement	Agreement	Disagreement	Agreement
<u>Spreadsheet</u> (Reliability .89)					
4	I can use a spreadsheet to create a graph	20.6	65.5	20.9	65.1
16	I can use a spreadsheet to make a chart	24.1	62.1	18.6	67.4
20	I can format cells in a spreadsheet (change font, style, etc.)	16.6	70.0	9.3	81.4
41	I can demonstrate spreadsheet skills in the classroom or in the computer lab	26.7	53.3	16.3	65.2
46	I can input formulas into cells in a spreadsheet	25.0	53.6	23.3	67.5
48	I can sort a row of cells	31.0	55.2	28.0	62.8
59	I can use the input command and place graphics into a document	13.3	73.4	14.0	62.1
	Median	24.10	62.10	18.60	65.20
<u>General Computer Use</u> (Reliability .89)					
1	I can access my e-mail account	20	80.2	0.0	95.3
5	I can send an email	16.7	83.4	7.0	63.0
6	I can use a search engine	10.0	76.7	4.7	95.3
7	I can write a multi page document	13.3	80.0	4.7	93.0
11	I can open a computer program	6.6	93.3	2.3	93.0
12	I can quit a computer program	6.6	93.3	0.0	93.0
13	I can format a page	6.6	86.7	4.6	90.7

15	using bullets and numbering I am familiar with basic computer components (monitor, floppy drive, and CD Rom	3.3	93.3	2.3	90.7
	Median	8.30	85.05	4.60	93.00
<u>Advanced Word Processing</u> (Reliability .84)					
23	I know the difference between a draw document and a word processing document	20.0	63.3	20.9	74.4
51	I can format a document using page numbers	20.6	58.6	9.3	81.4
52	I can group images	27.6	58.6	20.9	67.5
53	I can format a page using tabs and margins	17.2	80.0	9.3	86.0
54	I can create a text box in a draw document	17.2	65.5	23.3	67.5
55	I avoid computer virus spread	13.4	66.7	11.7	76.7
	Median	18.60	64.40	16.30	75.55
<u>Share Information</u> (Reliability .85)					
22	I can send an e-mail with an attached file	10.0	66.7	7.0	90.7
24	I can use the thesaurus	6.6	86.7	0.0	95.3
30	I can demonstrate general computer use skills in the classroom or in the computer lab	10.0	90.0	4.7	93.0
31	I can demonstrate word processing skills in the classroom or in the computer lab	10.0	86.7	4.6	90.7
36	I can open more than one browser at a time and toggle between them	3.3	93.3	2.3	93.0
39	I can copy information from one e-mail, paste it into a new message, and send it	6.6	90.0	9.4	86.0

	Median	8.30	88.35	4.65	91.85
<u>PowerPoint Presentations</u> (Reliability .82)					
2	I can create a basic slide presentation with text and graphics	30.0	60.0	18.6	74.4
18	I am familiar with the basic tools in a draw document	36.7	56.7	16.3	69.8
19	I can use different text styles (bold, italic, etc)	0.0	92.9	2.4	97.6
45	I can rearrange the slides in my presentation	27.6	72.4	23.3	65.1
57	I can create a presentation that is presented manually (mouse click) or automatically (timed)	31.0	58.6	23.2	65.1
63	I can add visual effects to the slides in my presentation	23.3	70.0	25.6	62.8
	Median	28.8	65.00	20.95	67.45
<u>Basic Word Processing</u> (Reliability .73)					
27	I know the difference between "save" and "save as"	6.7	86.7	4.7	93.0
32	I can use the help menu on programs when I need to figure something out	10.0	80.0	7.0	86.1
37	I can set the desired print range	3.3	86.7	11.6	83.7
59	I can resize an image	13.3	73.4	14.0	72.1
	Median	8.35	83.35	9.30	84.90
<u>Ethical Use of Computer</u> (Reliability .67)					
9	I respect the rights of copyright owners	16.7	80.0	4.7	91.1
35	I do not use the school system to access material that is profane or obscene	21.4	71.4	4.6	93.0
38	I do not try to bypass content filtering systems	28.6	67.8	14.0	65.1
	Median	21.40	71.40	4.70	91.10

Findings

The Cronbach alpha range of reliability for the survey was .67 to .89. Relatively small differences in median percentages among the seven variables were reported by the respondents. However, when comparing the responses based on the medians of the variables there are greater percentages of agreement in the areas of general computer use, sharing information, and basic word processing. The college seniors reported higher levels of agreement in general computer use (93.00 %), sharing information (91.85 %), and ethical use of computers (91.10%). The college freshmen reported higher levels of agreement based on median percentages in general computer use (85.50%), sharing information (88.35%) and basic word processing (83.35%). Freshmen reported higher levels of disagreement in the areas of spreadsheet (24.10%), PowerPoint (28.80%) and ethical use of computers (28.60%). Seniors reported higher levels of disagreement in the areas of PowerPoint presentations (20.95%). Both groups reported higher levels of agreement in sharing information, basic word processing, and general computer use. Furthermore both groups reported higher levels of disagreement in the use of spreadsheets, advanced word processing and, PowerPoint presentations.

Examining individual items revealed more specific findings. The greatest differences in the levels of agreements between freshmen and seniors were in the following areas: formatting cells in a spreadsheet, demonstrating spreadsheet skills, inputting formulas into cells, using the input command and placing graphics into a document.

The items that measured spreadsheets had a reliability of .89 with the greatest differences in the levels of agreement between freshmen and seniors in: formatting cells in a spreadsheet (11.4%) and inputting formulas in cells (13.9%). The items that measured general computer use had a reliability of .89 with the greatest differences in the levels of agreement between freshmen and seniors in: accessing email (15.1%), using a search engine (18.6%), and writing a multi page document (13.0%). The items that measured advanced word processing had a reliability of .87 with the greatest difference in the level of agreement between freshmen and seniors in formatting a document using page numbers (28.8%). The items that measured sharing information had a reliability of .85 with the greatest difference in the level of agreement between freshmen and seniors in sending an email with an attachment (24.0%). The items that measured PowerPoint presentations had a reliability of .82 with the greatest difference in the levels of agreement between freshmen and seniors in: creating a basic slide presentation (14.4) and familiarity with basic tools in a draw document (13.1%). The items that measured basic word processing had a reliability of .73; there was no significant difference in the levels of agreement for the items between freshmen and seniors. The items that measured ethical use of computers had a reliability of .67 with the greatest levels of difference in the levels of agreement between freshman and seniors in: respecting copyright owners (11.1%) and not using the school system to access profane or obscene material (21.6%).

Educational Importance of the Study

This study examined the perceptions of college freshmen and college seniors related to their competencies in information technology skills acquired in high school and college. By examining the individual items that comprised each of the seven variables a clearer picture of the levels of agreement and disagreement can be gained to understand students' perceptions of their strengths and weaknesses in information technology skills acquired in high school and college. The results of this study can be used to review the current curricula offerings for high school and college students. The growing need for strong instructional technology skills is a challenge that current and future students will face. The demand for academic accountability has placed an emphasis on teaching and learning in preparation for assessments that do not measure informational technology skills. Courses that focused on keyboarding, word processing and other software applications have been replaced with remedial and elective courses that do not necessarily offer direct instruction on the technology skills that were identified as weaknesses in this study. Schools must look at the formal preparation and opportunities that are offered for students. The need for higher levels of competency in information technology will continue to increase as our nation competes in a technologically driven global society. Schools should consider a digital portfolio or exit assessment that will measure the informational technology skills that are necessary to apply and succeed in higher education. Educators would be able to assess student's content area knowledge while measuring their ability to apply information technology skills. If schools integrate the consistent use of these skills they will also increase student access and use of technology thus reducing the digital divide that exists in many school communities. These skills should be integrated and nurtured throughout the curricula in high schools and colleges. This practice will enhance a student's preparation as they learn and communicate through the use of technology to compete in a global society. Information technology continues to advance and develop. The educational preparation that our students receive must continue to evolve and develop to reflect these changes and allow them to compete in the advanced age of information technology.

Recommendations for future studies include examining these relations by gender and ethnicity individually and by gender and ethnicity as a combined group to determine if there are any significant differences in these groups. Additionally, technology skills are not only important for students to succeed in college. It is also recommended to examine the faculty's perceptions of their strengths and weaknesses in the same variables and items and the perception of college faculty toward students' competencies in informational technology.

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