Gender Differences in Attitudes toward Computers and Performance in the Accounting Information Systems Class

By: Mary Jane Lenard, Susan Wessels, and Cindi Khanlarian

Mary Jane Lenard, Susan Wessels, Cindi Khanlarian, "Gender Differences in Attitudes Toward Computers and Performance in the Accounting Information Systems Class," *American Journal of Business Education*, Volume 3, Number 2 (2010).

Made available courtesy of The Clute Institute for Academic Research: http://www.cluteinstitute.com/

Abstract:

Using a model developed by Young (2000), this paper explores the relationship between performance in the Accounting Information Systems course, self-assessed computer skills, and attitudes toward computers. Results show that after taking the AIS course, students experience a change in perception about their use of computers. Females' self-evaluation of their computer skills improved significantly after the course, while males' self-evaluation showed no change. Females also received significantly higher grades compared to males. There was a significant relationship between confidence and self-assessed computer skills. This study shows that the AIS course is successful in developing students' confidence in using computers. Training that results in accurate self-assessment of skills may influence the choice of careers and one future success in those careers.

Keywords: Gender issues in accounting, computer attitudes, skill self-assessment

Article:

INTRODUCTION

Proficiency in using computer technology, databases, and information systems is critical for success in the accounting profession. Fast-paced innovation means that accountants must not only be up-to-date, they must be able to stay ahead. As students prepare for accounting careers, the Accounting Information Systems (AIS) course should develop computer technology and software skills as well as enable them to adapt to future advances in the field.

Adding computer technology to educational programs has raised questions about gender differences in attitudes and abilities and how those differences might be related to student performance. Young (2000) examined gender differences among high school students, and found that they considered computer use to be a male domain. Crews and Butterfield (2003) studied college students in information technology courses and found a decrease in the number of females earning bachelor's degrees in computing. Other studies found that females had reduced aspirations for technology fields (Almer & Single, 2007; Danziger & Eden, 2007). Fels (2004) found that the ambition of females is linked to two components, mastery and recognition, and that when females believe recognition is lacking, there is a downward spiral in which ambition stalls.

Correll (2004) relates the differing assessments that males and females may make about their competence to the formation of different aspirations for career paths. The author found that when participants in her study believed that males and females had equal ability at a task, there was no difference in either assessments or aspirations. Previous studies have indicated that the ability to perform an accurate self-assessment is important to career success (Lortie-Lussier & Rinfret, 2005; Raelin, 1997; Messmer, 2004).

In another study, Torkzadeh and Van Dyke (2002) examined the effects of training on Internet self-efficacy and computer user attitudes, where self efficacy relates to one's belief in one's capability to perform a task (Bandura,

1977). These authors used the concept of self-efficacy to understand technology acceptance, implementation, and use. This study found that training significantly improved self-efficacy scores for both males and females. It is interesting to note that male respondents consistently scored higher than females for Internet self- efficacy on both pre- and post-training scores. Training did not significantly affect computer attitudes of either males or females.

Trauth et al. (2008) analyzed a number of issues that affect females' choice of an information technology (IT) career, including childcare, parental care and working outside the home. The authors have called upon educators and employers to work together to conduct outreach programs for students and even for parents. In an analysis of the gender income gap and the role of education, Bobbit-Zeher (2007) noted that although females now surpass males in undergraduate degrees, gender parity in the highest degrees has yet to be realized, with females receiving approximately 45% of all professional and doctoral degrees. A similar result is reflected in the Institute of Management Accountants (IMA) salary from 2008, which examined job characteristics of its members. According to the study, females are less likely to have advanced degrees (46% to 53%), and less likely to have any kind of certification (63% vs. 72%). These differences are statistically significant (Schroeder and Reichardt, 2009). Attainment of these higher degrees and certifications also translates to higher income.

Young (2000) used a questionnaire adapted from the Computer Attitude Survey (Fennema & Sherman, 1976) in order to assess middle and high school students' attitudes and self-assessment of their computer skills. Young's study measured five factors associated with computer attitudes: confidence, perception of computers as a male domain, positive teacher attitudes, negative teacher attitudes, and perceived usefulness of computers. These factors were also related to a self-rating of computer skills, access to and use of computers at home and school, and family role models of computer users. Young found that males were more likely to have claimed computers as a male area, while females reported finding computers more useful for school and careers. However, the females were more likely to consider themselves as not the type to do well with computers, and less likely to say they could handle a more difficult computer course. Self-reported skill was significantly related to higher levels of confidence and the absence of negative teacher attitude.

The literature suggests that the effectiveness in using computer technology is related to training, computer attitudes, confidence, and gender. It is important to understand whether the training received in the AIS course is positively related to improving computer attitudes and confidence in using technology.

RESEARCH OBJECTIVE

The focus of the present study is to examine the relationship between performance in an AIS course, self-assessed computer skills, and attitudes toward computers. We will also examine what factors contribute to the students' assessment, both before and after they complete the course. We then suggest what might be done in the AIS class to encourage females to pursue more IT-related careers in accounting.

METHOD

During the 2007-2008 academic year, students in sections of the undergraduate AIS class at three different southeastern colleges and universities were surveyed. A total of 101 students completed anonymous, coded surveys at the beginning and end of the course. In addition, with student permission, their final course grade was submitted to the researchers by the course instructor. There were 58 female students and 33 male students who completed both questionnaires. Student participation was not a requirement of the course.

The questionnaire employed in this study is called the Computer Attitude Survey (CAS). It was developed by Young (2000) and used with permission. The first question asked for the student's self-assessment of their computer skill (from "clueless" to "great" on a 5-point scale). Following this, a set of questions asked about the student's attitudes and opinions about computers focusing on the differences between males and females in solving computer problems, advanced use and study of computers, and whether the student is sure of himself or herself when using computers. Students' responses were based on a rating scale of 1 to 5, ranging from "strongly agree" for a response of 1 and "strongly disagree" for a response of 5.

A paired samples t-test was used to examine differences in self-assessed computer skills before and after the AIS course. An independent samples t-test was used to compare differences between males' and females' self-assessed skills.

The 48 items of the CAS administered at the beginning of the class were subjected to principal components analysis (PCA) The resulting attitude fact0rs from the CAS were used as independent variables in a regression model with the self-assessment score as the dependent variable to determine which attitude factors are related to the self-assessed computer skill rating.

Finally, the final numerical course grades for each participant were collected and the mean scores computed for males and females. An independent samples t-test was used to determine if there was a significant difference in grades between males and females in the AIS course.

RESULTS

The results show that when rating their skill level after taking the AIS class, all students ranked their skills significantly higher than when they started the course. There was a significant difference in the self-assessed skill levels of females, increasing from 3.76 ("average) before the course to 4.07 ("pretty good") after the course. The self-assessed skill rating for males before the course was 3.79 ("average") and it improved to 3.82 afterward, but this was not significant (see Table l, Panel A). When comparing the result between males and females, the self-ratings by females after the course were significantly different from those of the males (Table l, Panel B).

Table 1: T-tests for Comparison of Means for the Self-Ranking of Computer Skill in the Computer-Attitude Survey Ranking of 5 ("Great") to Ranking of 1 ("Clueless")

Panel A – Comparison of rankings after the course vs. before the course

	Mean – Before	Mean – After	T-value
All students	3.77	3.98	- 2.459 **
Females	3.76	4.07	- 3.236 ***
Males	3.79	3.82	- 0.190

Panel B – Comparison of Males' scores vs. Females' scores

	Mean – Females	Mean – Males	T-value
Before the course	3.76	3.79	0.859
After the course	4.07	3.82	3.997 **

Females, n=58; Males, n=33
* p ≤ .10; ** p ≤ .05; *** p ≤ .01

Principal components analysis revealed the presence of twelve components with eigenvalues exceeding l, cumulatively explaining 73.8 per cent of the variance. It was decided to extract all factors until the last factors accounted for only a small portion of the explained variance (less than 4 percent). Five components were retained for further investigation. The five factor solution explained a total of 54.0 percent of the variance. As shown in Table 2, the factors were identified as follows:

- Component 1, "Usefulness of computers", contributed 15.6 percent of the total variance. This factor includes items that refer to the importance of computers in one's life work as well as statements that computers are necessary to learn about in school and that using computers is just as important for males and females.
- Component 2, "Confidence", contributed 11.5 percent. This factor includes items about whether the respondent believes that using a computer is hard and whether he or she is the type to "do well" with computers.

- Component 3, "Male domain", contributed 10.7 percent. This factor includes items about males being better than females in using computers. These questions are structured so that a high score indicates a strong *disagreement* that computers are a male domain.
- Component 4, "Negative teacher attitudes", contributed 10.1 percent. This factor includes questions about the difficulty of getting the respect of the teacher and the inability of the student to talk to the teacher. These questions are structured so that a high score indicates a strong *disagreement* with, or *absence of*, a negative teacher attitude.
- Component 5, "Teacher Involvement", contributed 6.1 percent. This factor includes items about whether the teacher takes an active interest in the student and encourages him or her to study computers, take advanced computer work, or go on to a career in computers.

The interpretation of these five components is consistent with previous research on the CAS conducted by Young (2000) which also found five factors related to student attitudes toward computers.

Table 2: Principal Components Analysis for the Student Information Questionnaire

	Eigenvalues		
Component	**Total**	**% of variance**	**Cumulative %**
1 – Usefulness	7.466	15.554	15.554
2 – Confidence	5.504	11.466	27.020
3 – Male domain	5.148	10.725	37.744
4 – Negative teacher attitude	4.869	10.143	47.887
5 – Teacher involvement	2.949	6.144	54.031

A standardized regression factor score was created for each of the five extracted components using a linear combination of the items that loaded on each factor.

Next we examined the relationship among the five attitude factors and the self-assessment score, by performing a regression analysis in which the self-assessment score at the beginning was the dependent variable and the five attitude factor scores at the beginning were the independent variables. "Confidence" (including attitudes about the difficulty of learning to use computers) was significantly related to the self- assessment score for males, females, and the entire group. For females the factor "negative teacher attitudes" (including beliefs that teachers don't take them seriously) were also significant. For males the factor "male domain" (a lower score indicating that males are better than females in using computers) and the factor "teacher involvement" (including attitudes about teachers encouraging them to do well) were significantly related to self-assessment scores at the beginning of the MS course (see Table 3, Panels A, B, and C).

We then conducted a regression analysis using responses after the course was completed. The ending self-assessment score was the dependent variable and the five ending attitude factor scores were the independent variables. Only the "confidence" factor was significant for males, females, and the entire group. (see Table 3, Panels A, B, and C). This finding that confidence is significantly related to training supports the results of Torkzadeh and Van Dyke (2002).

An independent samples t-test was conducted to compare the final course grades for males and females. Female grades were significantly higher (M = 86.07, SD = .083) than male grades (M = 82.26, SD = .070), $t(89) = 2.346$, $p = .021$. A regression model was run using the final course grade as the dependent variable and the regression scores for the five components as the dependent variable. None of the attitude factors were significantly related the final course grades for either males or females or the entire group.

Table 3

Panel A: Regression Analysis of Self-Reported Skill on Student Information Questionnaire Administered on All Students in the AIS Course

Variable	*Before* the course (R^2 = .264)		*After* the course (R^2 = .251)	
	Coefficient	T-value	Coefficient	T-value
Intercept	1.8310	2.584 **	1.2220	1.994 **
Usefulness	- 0.0233	- 1.583	0.0078	0.579
Confidence	0.0549	3.932 ***	0.0480	3.874 ***
Male domain	- 0.0093	- 0.466	- 0.0046	- 0.233
Negative teacher attitude	0.0350	1.393	0.0179	0.688
Teacher involvement	0.0369	1.603	- 0.0006	- 0.028

* p ≤ .1; ** p ≤ .05; *** p ≤ .01

Panel B: Regression Analysis of Self-Reported Skill on Student Information Questionnaire Administered on Female Students in the AIS Course

Variable	*Before* the course (R^2 = .218)		*After* the course (R^2 = .269)	
	Coefficient	T-value	Coefficient	T-value
Intercept	- 0.5530	- 0.317	2.1250	1.915 *
Usefulness	- 0.0448	- 0.189	- 0.0056	- 0.304
Confidence	0.0456	2.562 **	0.0502	3.653 ***
Male domain	0.0212	0.683	- 0.0020	- 0.076
Negative teacher attitude	0.0541	1.660 *	0.0058	0.207
Teacher involvement	0.0146	0.506	0.0094	0.428

* p ≤ .1; ** p ≤ .05; *** p ≤ .01

Panel C: Regression Analysis of Self-Reported Skill on Student Information Questionnaire Administered on Male Students in the AIS Course

Variable	*Before* the course (R^2 = .537)		*After* the course (R^2 = .537)	
	Coefficient	T-value	Coefficient	T-value
Intercept	2.3190	2.975 ***	1.2730	1.023
Usefulness	- 0.0248	- 1.237	0.0161	0.598
Confidence	0.0876	3.836 ***	0.0497	1.701 *
Male domain	- 0.0459	- 1.671 *	- 0.0155	- 1.420
Negative teacher attitude	0.0038	0.104	0.0213	0.375
Teacher involvement	0.0702	1.904 *	- 0.0213	- 0.509

* p ≤ .1; ** p ≤ .05; *** p ≤ .01

DISCUSSION AND CONCLUSIONS

Performance in an AIS course, as measured by final course grade, was not found to be related to attitudes toward computers. However, completion of an AIS course appears to reduce the perception by females that teachers don't take them seriously and other negative attitudes about teachers. For males, their experiences in an AIS course diminishes their beliefs that computers are a "male domain."

Before taking the AIS course, there was no significant difference in the self-ranking of computer skills between males and females with both groups ranking themselves as "average." By the end of the course, females' self-assessment of their computer skills improved significantly and their scores were significantly higher than the scores of the males. This result supports findings in other studies that confidence affects self-assessment. The confidence of female students became a more significant factor after taking the AIS course than before the course.

While our study indicates that the MS class is successful in developing students' confidence in computer skills needed in the Accounting profession, a proposed next step is that students, especially females, must see the link between self-assessment and career success and learn to assess their skill by relying more on their own perception of their ability than on the involvement or approval of others.

IMPLICATIONS OF THE FINDINGS

In order to enhance our understanding of the relationship between accounting education and stronger choices for females in the accounting profession, we recommend continued emphasis on technology instruction in the MS class. Specifically, the following areas should be considered:

- The MS class should be sure to stress IT skills as the main focus of the job instead of as a product to assist with the job. This can be accomplished as suggested by Trauth et al. (2008), with career outreach to professionals - both females and males - in accounting specialties with an IT focus. There can also be more reinforcement of IT throughout the accounting curriculum.
- In addition, the MS class and accounting curriculum in general should include topics on more advanced technologies. Topics such as expert systems and web design using HTML (Hypertext Markup Language) are already covered on the CPA exam. These topics need to be extended to include languages such as XML (eXtensible Markup Language) and XBRL (eXtensible Business Reporting Language), especially given the new directive by the SEC which requires companies to provide fmancial information tagged using XBRL.
- Finally, accounting curriculums should reinforce the need to achieve certifications, whether it be the CPA or certifications such as CMA and CISA that require more knowledge of IT concepts. And given the findings of Schroeder and Reichardt (2009) and Bobbit-Zeher (2007), students — especially females — should also be encouraged to pursue an advanced degree.

ACKNOWLEDGEMENT

The authors wish to thank Professor Robin Pennington (Department of Accounting, North Carolina State University) for her assistance with this project.

REFERENCES

1. Almer, E.D., & Single, L.E. (2007). Shedding light on the AICPA work/life and women's initiatives research: What does it mean to educators and students? *Issues in Accounting Education*, 22(l), 67-77.
2. Bobbit-Zeher, D. (2007). The gender income gap and the role of education. *Sociology of Education*, 80(l), 1-22.
3. Correll, S.J. (2004). Constraints into preferences: Gender, status, and emerging career aspirations. *American Sociological Review*, 69(1), 93-113.
4. Crews, T., & Butterfield, J. (2003). Improving the learning environment in beginning programming classes: An experiment in gender equity. *Journal of Information Systems Education*, 14(1), 69-76.
5. Danziger, N, & Eden, Y. (2007). Gender-related differences in the occupational aspirations and career-style preferences of accounting students. *Career Development International*, 12(2), 129-149.
6. Fels, A. (2004). Do women lack ambition? *Harvard Business Review*, 82(4), 50-60.
7. Lortie-Lussier, M., & Rinfret, N. (2005). Determinants of objective and subjective success of men and women. *International Review of Administrative Sciences*, 71(4), 607.
8. Messmer, M. (2004). Increasing your visibility at work. *Strategic Finance*, 86(5), 12-14.
9. Raelin, J.A. (1997). Internal career development in the age of insecurity. *Business Forum*, 22(1), 19-24.
10. Schroeder, D.L., & Reichardt, K.E. (2009). IMA 2008 salary survey. *Strategic Finance*, (June), 29-37.
11. Torkzadeh, G. & Van Dyke, T.P. (2002) Effects of training on Internet self-efficacy and computer user attitudes. *Computers in Human Behavior*, 18, 479-494.
12. Trauth, E.M., Quesenberry, J.L., & Huang, H. (2008). A multicultural analysis of factors influencing career choice for women in the information technology workforce. *Journal of Global Information Management*, 16(4), 1-23.
13. Young, B.J. (2000). Gender differences in student attitudes toward computers. *Journal of Research on Computing in Education*, 33(2), 204-217.