The Effects of Students' Knowledge and Attitude on the Classroom Performance: Focusing on Computer Self-Efficacy

Ulysses J. Brown, III
Savannah State University

Yonpae Park
Savannah State University

Sungwoo Jung
Columbus State University

Abstract

This study examines the relationship between exogenous variables to dependent variables of interest regarding the students' learning of subjects. Specifically, the theoretical model links prior computer knowledge and computer attitude to the learning of subjects and students' computer performance, mediated by computer self-efficacy and spreadsheet self-efficacy. The model was empirically tested using repeatedly measured responses to a questionnaire. The empirical technique employs structural equations with latent variables. Discussions of the implications, limitations, and future research suggestions are followed.
Keywords: computer performance, self-efficacy, computer attitude.

INTRODUCTION

Technologies used in business have evolved from manual bookkeeping to the advanced information technologies over the ages. The fundamental changes brought by information technology (IT) have significantly changed the way companies operate their businesses which, in turn, have led to changes in the management records and procedures. For example, in marketing, technology is a critical factor in every company's external environment as well as customer relationship management (CRM). Also the American Institute of Certified Public Accountants (AICPA) has recently stated that accountants need to change their strategies in reaction to the all-encompassing changes in IT linking business transactions (AICPA 2001). Even though both accounting regulator and industry have called for computer knowledge and skills that are taught in accounting education, there is little research examining the relationship among anxiety, self-efficacy, knowledge and skills in computer-related accounting education.

This study examines the relationship between exogenous variables to dependent variables of interest regarding business students' learning of subjects. Specifically, the theoretical model links students' prior computer knowledge and computer attitude to the learning of subjects and students' computer performance, mediated by computer self-efficacy and spreadsheet self-efficacy. The model was empirically tested using repeatedly measured responses to a questionnaire from the students in a business class. The empirical technique employs structural equations with latent variables.

LITERATURE REVIEW

Computer attitude

Monitoring the computer attitudes and developing an understanding of the factors that affect computer attitudes will assist educators in providing appropriate learning experiences to students. The successful integration of computers in educational environments depends, to a great extent, on students' attitudes towards them. In order to identify factors that contribute to the formation of students' attitudes, this study presents the development and validation of widely used computer attitude scale (CAS) especially designed for accounting information systems students. Base on CAS used by Selwyn (1997), this paper's 6-point scale consists of factors such as self-confidence in previous knowledge, hardware usage anxiety, computer engagement, fears of long-lasting negative consequences of computer use and evaluation of positive consequences of computers.

Woodrow (1992) shows that a positive computer attitude is a necessary prerequisite and an integral part of computer literacy. Kernan and Howard (1990) examine computer attitude and anxiety scales and find that computer anxiety and attitude toward computers should be treated as separate constructs. They demonstrate some evidence of the convergent validity of the computer anxiety construct but conclude that the predictive validity of computer anxiety and various computer attitudes is low. Computer anxiety has received considerable attention in the psychologically-based literature and is defined as generalized emotional distress or the tendency of an individual to be uneasy, apprehensive and/or a fear (i.e., a feeling not a belief) towards current or future use of computers (Chu and Spires 1991; Torkzadeh and Angulo 1992; Igbaria and Iivari 1995). Computer anxiety may include worries about embarrassment, looking foolish or even damaging computer equipment (McInerney et al., 1994). Research suggests that computer anxiety is relatively common among college-age undergraduate students (Lepper 1985; Pop-Davis and Vispoel 1993; Rosen and Maguire 1990). Prior studies have found that computer anxious individuals tend to show negative attitudes about using computers and exacerbate rather than cure the problem, with additional computer experiences promoting further computer avoidance. Although evidence on the effects of instruction and training on computer anxiety is mixed, there is some evidence that well-designed instruction and training can decrease computer anxiety (Rosen and Maguire 1990). Computer anxiety may be a function of individuals' prior computing experiences, attitude towards computing, perceptions of self-efficacy and expectations of success (McInerney et al. 1994).

The Technology Acceptance Model (TAM) has been used as the framework to determine whether perceived usefulness and perceived ease of use affect the acceptance of new information system. Ramayah et al. (2005) examine the effect of perceived usefulness and perceived ease of use on the IT acceptance and find that perceived usefulness is a more important determinant on IT acceptance than perceived ease of use. Aladwani (2002) reports the results of a field study that investigated the relationship among organizational actions (management advocacy and internal computing support), computer attitudes, and end-user satisfaction in public organizations. The results show that management advocacy has positive direct effects on computer attitudes and end-users satisfaction. The existence of a reliable and valid measure of self-efficacy makes assessment possible and should have implications for organizational support, training, and implementation of AIS. Wilson and Daubek (1992) investigate the computer attitudes of marketing students. Class standing, course, and the number of computer-using courses students take are found to have a positive effect on computer anxiety, computer confidence, and overall computer attitude. The results, however, show that class and course do not affect computer liking or perceptions of computer usefulness. GPA has a positive relationship to an attitude scales except computer liking. Age and gender do not appear to be related to any of the computer attitude measures evaluated.

Self-Efficacy

Self-efficacy as a construct has been studied in psychology for many years (Bandura 1986). It has been introduced to the IT research in the form of computer/software self-efficacy (Compeau and Higgins 1995). In an IT usage context, self-efficacy represents an individual's perceptions of his or her ability to use computers and software in the accomplishment of a task, rather than reflecting simple possession of component skills. This paper discusses the role of students' beliefs about their abilities to competently use computers and spreadsheet (computer/software self-efficacy) in the determination of computer and software use. A survey of accounting information systems students was conducted to develop and validate a measure of computer/software self-efficacy and to assess both its impacts and antecedents.

In prior research, computer self-efficacy was found to exert a significant influence on users' expectations of the outcomes of using computers, their emotional reactions to computers (affect and anxiety), as well as their actual computer use (Compeau and Higgins 1995). Studies have shown that self-efficacy is related to computer anxiety and

training as well as learning performance and computer literacy (Beckers and Schmidt 2001; Chou 2001). Research also indicates that increased performance with computer related tasks was significantly related to higher levels of self-efficacy (Harrison and Rainer 1997). Havelka (2000) investigates demographic predictors of software self-efficacy among undergraduate business students. He finds that significant differences in software self-efficacy among students with different majors, amounts of computer-related experience, and computer anxiety levels. Chung et al. (2002) study the differences in self-efficacy among students in the business, education, forest/wildlife, and liberal arts schools of a major university. They find that, in general, business students tend to have higher expectations from computer usage than students in the other disciplines. Most recently, Strand et al. (2003) investigate whether the self-efficacy has an effect on the performance of individuals in an unstructured accounting task such as those performed by an internal auditor. They find that the self-efficacy of accounting students, who are identified as proxies for entry-level internal auditors, seems to be improved based on the fraud-specific training they receive and articles they read. However, the knowledge-based self-efficacy do not improved performance in their study.

Accounting Information Systems

The objective of accounting information systems is to collect and store data about business processes that can be used to generate a meaningful output for decision makers. Many economics events are now being captured, measured, recognized, and reported electronically, without any paper documentation; and online, real-time accounting is emerging as the system of choice (Rezaee, 2000). Understanding the factors that influence an individual's use of such information technology has been a goal of information systems research since the mid-1970s, when organizations and researchers began to find that adoption of new technology was not living up to expectations. The Cohen Commission suggested that "one of the causes of the discontinuity between accounting theory and practice is that students graduate from accounting programs with no understanding of the mechanics of how an accounting system operates and what the related documentation looks like" (AICPA, 1978). Lack of such system knowledge can be a deterrent for accounting students in understanding the practical business functions. Many accounting professionals, therefore, opine that universities should provide this AIS training (Heagy and McMickle, 1988; Siegel and Sorensen, 1994). On the other hand, American Accounting Association Committee (AECC) identifies the design and use of information technology as a core dimension of basic accounting education

(AECC, 1986). Also, AECC's Position Statement #2 argues that the first course in accounting should include the principles underlying the design, integrity, and effectiveness of AI systems (AECC, 1991).

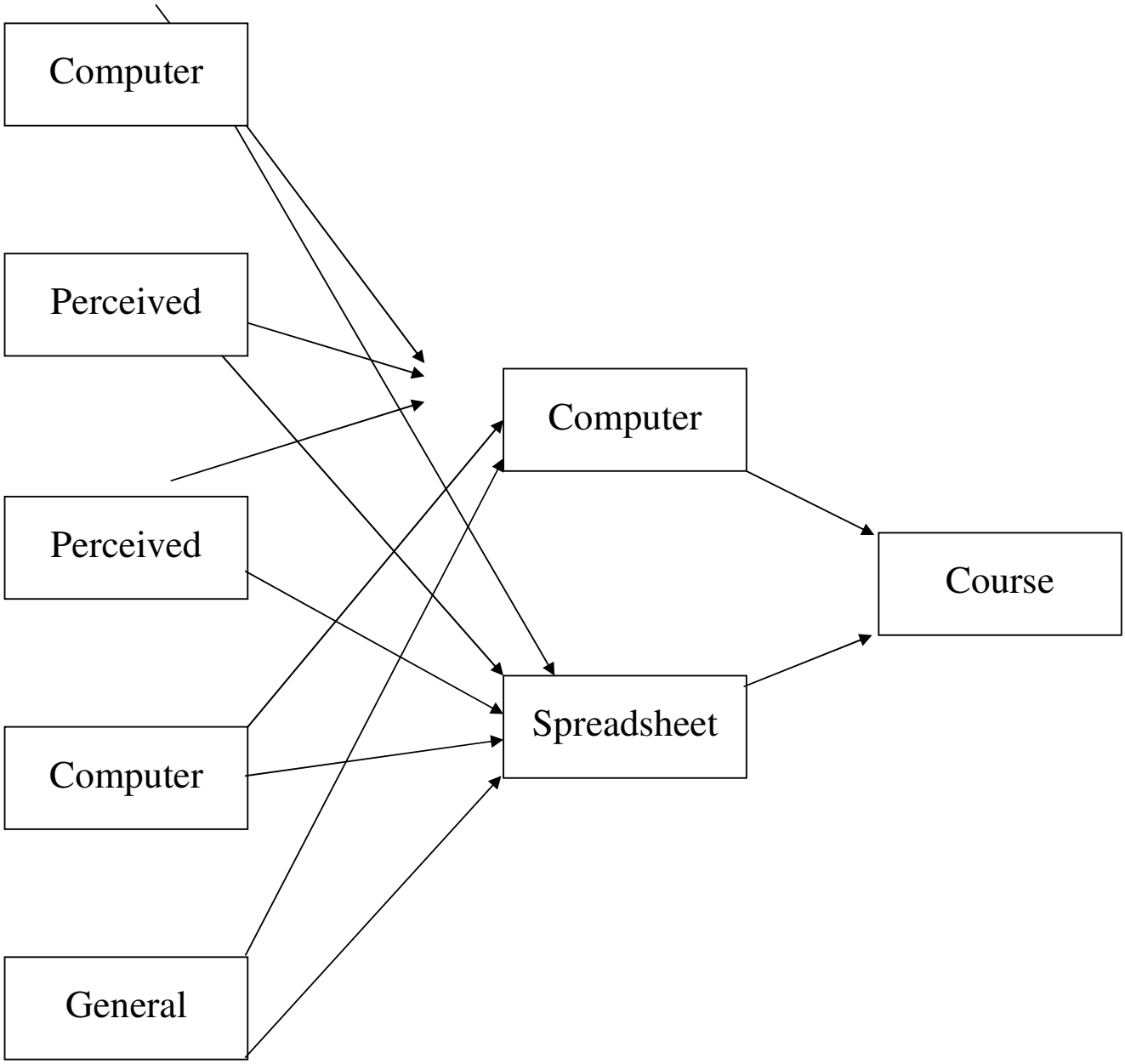
Lucas (1975, 1978) provides some of the earliest evidence of the individual or behavioral factors that influenced IS adoption. The first theoretical perspective to gain widespread acceptance in this research was the Theory of Reasoned Action (Fishbein and Ajzen 1975). This theory maintains that individuals would use computers if they could see that there would be positive benefits (outcomes) associated with using them. This theory is still widely used today in the information systems literature and has demonstrated validity. However, there is also a growing recognition that additional explanatory variables are needed (e.g., Thompson, et al. 1991; Webster and Martocchio 1992). One such variable, examined in this research, comes from the writings of Albert Bandura and his work on Social Cognitive Theory (Bandura, 1986).

Stone, Arunachalam, and Chandler (1996) examine the relationships among the psychological constructs of knowledge, skill, self-efficacy, and computer anxiety in accounting education. Sangster and Mulligan (1997) find that the World Wide Web (the Web) presents a new dimension in the provision of information, not just for entertainment and for business, but also for education. They reports on the integration of e-mail and the Web into a third year accounting information systems course. Brosnan (1998) examines the effect of computer anxiety and self-efficacy upon computer performance. He found that computer anxiety directly influences the number of correct responses obtained whilst self-efficacy determines how the task is attempted (namely, two procedures either accessing the data tables directly or constructing look-up table). Less anxious subjects obtained more correct responses and subjects with higher perceptions of self-efficacy used more look-up tables.

HYPOTHESIS

H1: As compared to T1, the scores for Computer Attitude, Perceived Ease of Use, Perceived Usefulness, Self-efficacy, Computer Self-efficacy, Spreadsheet Self-efficacy, and Computer Anxiety will be significantly different at T2 and T3.

Figure-1: Conceptual Model


Computer
Perceived
Perceived
Computer
General
Computer
Spreadsheet
Course

METHODOLOGY

For the current study, students in two Accounting Information Systems classes at a southeastern university were selected as a sample (n = 82). Three waves of data collection procedure has been done. (T1 = 40, T2 = 27, T3 = 15). Samples are 59.8% female, 76.8% Blacks, 13.4% Caucasian American.

Instruments were developed and used from previous research, in addition to subject's background information. One-way ANOVA was used as a statistical analysis.

- Computer Attitude Scale, 21 items, (Selwyn, 1997) [alpha=.82]
- Perceived Usefulness & Perceived Ease of Use Scale, 10 items, (Davis, 1989) [alphas=.96 and .98]
- GSES,17 items (Sherer et al, 1982) [alpha= .82]
- Computer Self-efficacy, 5 items, [alpha=.83]
- Spreadsheet Self-efficacy, 6 items, [alpha= .97]
- Computer Anxiety Scale, 5 items, [alpha= .89]

(Stone, Arunachalam & Chandler, 1996)

Table-1. Results of the ANOVA at Time 1, Time 2, and Time 3, (n = 82).

Variable	**T1**	**T2**	**T3**
Computer Attitude*	84.55	101.29	105.33
General Self-efficacy*	53.15	70.81	72.73
Perceived Usefulness*	15.55	33.59	34.73
Perceived Ease of Use *	16.3	30.70	33.00
Computer Self-efficacy*	18.05	31.40	32.06

Spreadsheet Self-efficacy*	19.47	32.48	35.13
Computer Anxiety*	7.45	9.11	16.66

*Significant at the .05 level; T1: n=40; T2: n=27; T3: n=15

CONCLUSIONS

When compared to T1, all scores significant. However, the results are different at Time 2, except for Computer Anxiety. At each Time period, higher scores were observed for the constructs. Computer Anxiety scores increased at each time period.

This results imply that the importance of software-specific training to students. Particularly, in Accounting Information System class, computer anxiety also increased over time though learning occurred. Therefore, instructors are encouraged to explore some ways to reduce students' computer anxiety.

REFERENCES

Accounting Education Change Commission, (1990). Objectives of education for accountants: Position statement number one. *Issues in Accounting Education*, 5(2), 307-312.

_____, (1991). AECC urges decoupling of academic studies and professional accounting examination preparation: Position statement number two. *Issues in Accounting Education*, 6(2). 313-330.

Aladwani, A. M., (2002). Organizational actions, computer attitudes, and end-user satisfaction in public organizations: an empirical study, *Journal of End User Computing*, 13(1), 42-49.

Bandura, A., (1986). *Social foundations of thought and action: A social cognitive theory*, Englewood Cliffs, NJ, Prentice Hall.

Brosnan, M. J., (1998). The impact of computer anxiety and self-efficacy upon performance, *Journal of Computer Assisted Learning*, 14(3), 223.

Chung, S.H., and P.H. Schwager, (2002). An empirical study of students' computer self-efficacy: differences among four academic disciplines at a large university, *Journal of Computer Information Systems*, 1-6.

Compeau, D. R. and C. Higgins, (1995). Computer self-efficacy: Development of a measure and initial test, *MIS Quarterly*, 19(2), 189-211.

Compeau, D. R., C. A. Higgins, (1995). Application of social cognitive theory to training for computer skills, *Information Systems Research*, 6(2), 118-142.

Compeau, D. R., C. A. Higgins, and S. Huff, (1999). Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study, *MIS Quarterly*, 23(2), 145-158.

Fishbien, M. and I. Ajzen, (1975). *Belief, Attitude, Intention and Behavior*, Addison-Wesley, Massachusetts.

Heagy, C.D. and P.L. McMickle, (1988). An empirical investigation of the accounting systems course: Academic practice versus practitioner needs, *Issues in Accounting Education*, 3(1), 96-107

Igbaria, M. and J. Iivari, (1995). The Effects of Self-Efficacy on Computer Usage, *Omega*, 23(6), 587-605.

McInerney, V., D. M. McInerney, and K. E. Sinclair, (1994). Student teachers, computer anxiety and computer experience, *Journal of Educational Computing Research*, 11(1), 27-50.

McInerney, V., McInerney, D. M., and Sinclair, K. E., (1994). Student teachers, computer anxiety and computer experience. *Journal of Educational Computing Research*, 11(1), 27-50.

Ramayah, T., O. Mohamad, F. Sarkawi, and L.S. Choong, (2005). Attitude and intention to use web-based supply chain management (SCM) among SMEs, *Working Paper*.

Rosen, L. D., D. C. Sears, and M. M. Weil, (1993). Treating technophobia: A longitudinal evaluation of the computerphobia reduction program, *Computers and Human Behavior*, 9, 27-50.

Sangster, A. and C. Mulligan, (1997). Integrating the World Wide Web into an accounting systems course, *Accounting Education*, 6, 53 – 62.

Siegel, G and J.E. Sorensen, (1994). What corporate America wants in entry-level accountants, New York: Institute of Management Accountants and The Financial Executives Institute.

Stone, D. N., V. Arunachalam, and J. S. Chandler, (1996). An empirical investigation of knowledge, skill, self-efficacy, and computer anxiety in accounting education, *Issues in Accounting Education*, 11, 345-376.

Thompson, R., C. Higgins, and J. Howell, (1991). Personal Computing: Toward a Conceptual Model of Utilization, *MIS Quarterly*, 15(1), 125-143.

Webster, J., and J. J. Martocchio, (1995). The differential effects of software training previews on training outcomes, *Journal of Management*, 21(4), 757-787.