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ABSTRACT

Two independent samples of students enrolled in a typical introduction to Information Systems course at a Midwestern university were surveyed in 1996 and 2006 to determine if business student computing efficacy changed over this ten-year period. Two computer self-efficacy (CSE) scales were administered to each sample and demographic data collected. The initial analysis of this research in progress data suggests that while students in 2006 report significantly more computer experience, use computers much more frequently, and take significantly more core courses that require computer use, this experience has not translated into significantly higher CSE scores. The implications of these preliminary findings for Information Systems educators are discussed.

KEYWORDS

Computer Self-efficacy (CSE), Computer Experience, Computer Use

INTRODUCTION

Students entering college today can logically be expected to have more computing experience than their counterparts of years past. They should be more likely to use computers in home, education, and workplace settings than their counterparts of a decade ago. The growth of the Internet and wireless networking technologies has also changed how, and accordingly how often, computers are used. Computers have become a primary communication tool for students of all ages, and are as likely to be purchased as a telecommunications device as a problem-solving tool. For example, students today make extensive use of e-mail, instant messaging, text messaging, social networking sites, and web browsing. The popularity of Web sites that support downloading, viewing, and posting video and audio applications and recordings provides additional anecdotal evidence of the immersion in and dependence of students on computing and telecommunications technologies.

The purpose of this research is to determine if greater experience with information technologies makes students more able and inclined to use information technology than were students of ten years ago. We wanted to determine how student computer experience and frequency of computer use have changed over a ten-year period, and how such changes may have affected their computer self-efficacy (CSE) regarding those skills traditionally taught in introduction to Information Systems classes. As discussed in the

following section, the CSE construct has provided valuable insights into the computing capabilities of individuals inside and outside the classroom (Smith 2004; Thompson et al. 2006).

COMPUTER SELF-EFFICACY

CSE is defined as "[. . .]a judgment of one's ability to use a computer" (Compeau & Higgins 1995 p. 192). Previous research indicates CSE plays a significant role in the development of computer skills (Gist et al. 1989), an individual's decision to use computers (Compeau & Higgins 1995), expectations of success with computers (Compeau et al. 1999), and computer-dependent course performance (Karsten & Roth 1998). Individuals high in CSE are more likely to choose and participate in computer-related activities, expect success in these activities, persist and employ effective coping behaviors when encountering difficulty, and exhibit higher levels of performance than individuals low in CSE. In sum, CSE appears to capture the competence and confidence we as Information Systems educators hope to instill in our students (Karsten & Roth 1998).

Individuals gain CSE information from a variety of sources (Bandura 1997): their own performance accomplishments (e.g., personal success and failure using computers), observing the successes and failures of others (e.g., friends, classmates), verbal persuasion (e.g., encouragement and support that reinforces the belief they can become computer competent), and emotional states (e.g., confidence or anxiety when faced with computer-dependent tasks). More years of experience and more frequent computer use should offer more opportunities to gather CSE information. However, it is important to note that CSE is a domain-specific, dynamic construct that changes over time as people acquire new information and experiences (Gist and Mitchell 1992). The nature of that change depends upon the relevancy of new information and experiences to the computing skills of interest. As mentioned previously, the computing skills of interest here are those traditionally taught in introductory Information Systems courses.

METHODOLOGY

Two independent samples of students enrolled in a typical introduction to Information Systems course at a Midwestern university were investigated ten years apart. The original sample consisted of 119 students enrolled in the Spring of 1996, while the second sample consisted of 114 students enrolled in the same course in Spring of 2006. Identical survey instruments were used and administered by the same instructor at the beginning of the semester. Study participants were compared on a variety of demographic and technical variables.

In addition to collecting basic demographic data, two CSE scales were also administered. The two scales employed in this study were developed independently by Murphy, Coover, and Owen (1989) and Compeau and Higgins (1995) and have been two of the most frequently employed measures in CSE studies (Marakas et al. 1998). Though both measures attempt to capture the same construct, visual inspection of the respective measures suggests obvious differences in approach to CSE assessment. Murphy, Coover, and Owen (1989) measure CSE via a 32-item scale as an individual's perceptions of his or her ability to accomplish specific tasks and activities involved in operating a computer (e.g., "I feel confident copying an individual file"). Subjects indicate their confidence on a 5-point scale (1 = strongly disagree, 5 = strongly agree). Compeau and Higgins (1995), on the other hand, assess CSE via a 10-item scale that assesses an individual's perceptions of his or her ability to use a computer application in the accomplishment of a job (e.g., "I could complete the assignment using the software package if there was no one around to tell me what to do as I go"). Subjects indicate their confidence on a 10-point scale (1 = not at all confident, 10 = totally confident). Though both measures were obviously developed over a decade ago, we believe they continue to ask questions that are relevant to assessing student computing

capabilities prior to training in an introduction to Information Systems course. As general measures of CSE, they also lend themselves to comparisons over time since they are not application specific.

PRELIMINARY RESULTS

Preliminary analysis indicates the samples have no significant differences in gender composition (approximately 60% male, 40% female), age (approximately 21 years old), major area of study (business), and class (approximately 80% in each sample were sophomores and juniors).

Significant differences between the samples exist in the number of years of computer experience and frequency of computer use. Study participants in 1996 averaged 5.0 years of computer experience compared to 8.7 years for the 2006 group. The samples differed dramatically in reported computer use, with 30% of students in the 1996 sample indicating they used a computer at least once a day compared to 84% of 2006 participants. The 2006 participants also reported taking significantly more college courses requiring computer use (mean = 4.4) compared to 1996 participants (mean = 2.7).

In spite of these significant differences in computer experience and computer use, analysis comparing the samples' CSE scores indicates there are no significant differences between group means on either the Murphy, Coover, and Owen measure (1996 mean = 3.64, 2006 mean = 3.74, $p>.20$) or the Compeau and Higgins measure (1996 mean = 6.11, 2006 mean = 6.28, $p > .42$). Subsequent regression analysis appears to support the means test and suggests other relationships of interest. Gender (males had significantly higher CSE scores than females), years of computing experience, and frequency of computer use are positively and significantly correlated to CSE scores on both measures. Class standing was significantly and negatively correlated with the CSE score on the Murphy, Coover, and Owen measure, but was not significantly related to CSE scores on the Compeau and Higgins measure. Finally, when gender, years of computing experience, frequency of computer use, and class standing were controlled for in a hierarchical regression analysis, it appears that there is a significant, negative relationship between group and CSE scores—the 2006 study participants tend to have lower CSE scores. Additional analysis continues in an effort to verify these results and gain greater insight into the relationship of all these variables.

CONCLUSION

A first look at the data suggests that some commonly held assumptions about student computing capabilities may be confirmed, while others may require additional investigation. Though additional analysis is obviously necessary, at the very least it appears that we as Information Systems educators should be hesitant to assume that increasing computer experience and more frequent computer use provides the basic computer skills and associated confidence necessary for success in business classrooms or the workplace.

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