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# Attitudinal and experiential predictors of technological expertise

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**Abstract**

This study sought to clarify which computer and Internet skills and experiences differentiate technological expertise and to identify predictors of this expertise. Two hundred and fifty-eight incoming university students were surveyed on Internet and computer experiences, skills, and attitudes. Six specific Internet and computer uses that differentiate technological expertise were identified based on frequency of use. Males and those who own computers had greater technological expertise. Factor analyses identified two skill factors (Internet skills, Computer/Math skills), three experience factors (Internet, Computer, Recreational Use of Internet), five attitude factors (Importance of Internet and computer knowledge, Computer aversive, Internet and computer comfort/competency, Internet and computer overuse, Technology aversive). These factors as well as gender, computer ownership, and weekly computer and Internet use were entered as independent variables in a general linear model (GLM) which was then used to determine which factors affected technological expertise. The overall GLM was significant ($R^2 = .414$, $F = 5.85$, $p < .001$). Internet and computer skills and computer abuse were the strongest predictors of technological expertise. Weekly Internet use, Internet and computer comfort/competency also were predictors, and gender was almost significant ($p = .056$) as a predictor. Neither computer ownership nor other Internet and computer attitudes were significant predictors.


*Keywords:* Technological expertise; Computer attitudes; Internet attitudes; Computer experience; Internet experience; Sex differences

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## 0. Introduction

If the twenty-first century follows the lead of the last century, the pace of technological change will continue to accelerate. Those with technological expertise will be at an advantage while those without it not may suffer economically and educationally. In the past two decades, computer and Internet expertise have been critical, and people with these skills have been in demand.

The pace of change with Internet and computer usage has been rapid. In the United States, home computer ownership has grown from 8% in 1983 to 56.3% in 2001 (National Telecommunications and Information Administration NTIA, 2000; US Census Bureau, 2001). Worldwide, Internet use has increased from a half million in 1989 to over a billion in 2006 (ClickZStats, 2004; Internet World Stats, 2006). Because of the rapid pace of computer and Internet adaptation, both the components of technological expertise and the relative role of demographic, experiential and attitudinal determinants of this expertise is fluid. The Graphics and Visualization Study (GVU) from Georgia Tech found that four specific Internet experiences were associated with high technological expertise: creating a Web page, customizing a Web page, changing cookie preferences, and listening to Web radio (Kehow, Pitkow, Sutton, Aggarwal, & Rogers, 1999). Earlier studies had found differing indicators of technological expertise, which supports that these markers shift with time (e.g. Weil & Rosen, 1995).

Given the importance of computers and the Internet and the competitive advantage of those with technological expertise with both, it is important to understand what factors are associated with technological competence. Past studies have found demographic indicators such as gender, educational status, age, and computer ownership key (Morahan-Martin, 1998; Schumacher & Morahan-Martin, 2001). The rapidly changing makeup of Internet and computer users has weakened many earlier demographic markers, but gender differences still exist. Generally, females have been less likely to be on the cutting edge of new technology than males (DeSantis & Youniss, 1991). However, when that technology becomes more established, gender differences diminish; this can occur within a few years (Morahan-Martin, 1998). For example, in the early 1980's, most of those in the US who used computers at work were males, but by 2000, the majority of those who use computers at work were females (US Census Bureau, 2000). Gender differences continue in specific computer applications. Females predominate in practical applications such as word processing while males dominate in more technologically sophisticated areas. In fact, the percent of women in computer science in the United States has decreased since the 1980's (Camp, 1997; Davies & Camp, 2000; Morahan-Martin, 1998; Schumacher & Morahan-Martin, 2001; US Census Bureau, 2000). Worldwide, men still are the dominant users of the Internet both in absolute numbers and in time spent online (ClickZStats, 2002; Fallows, 2005; International Telecommunication Union [ITU], 2006; NetValue, 2001).

Not surprisingly, experience has been found to be related to greater technological expertise. For both computers and the Internet, the length of previous experience and the amount of current usage have been associated with greater technological expertise (Schumacher & Morahan-Martin, 2001; Weil & Rosen, 1995). Similarly, experience and skills with specific types of applications such as programming and mathematical skills have been associated with greater overall expertise (Schumacher & Morahan-Martin, 2001). These experiential predictors also have shifted with time. In the early 1990's, when the Internet was the province of computer hackers, geeks, scientists and mathematicians, just