Chapter II
Exploring Gender Differences in Computer–Related Behaviour:
Past, Present, and Future

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ABSTRACT

This chapter explores gender differences in three key areas: computer attitude, ability, and use. Past research (10-25 years ago) is examined in order to provide a framework for a more current analysis. Seventy-one studies and 644 specific measures are analysed with respect to overall patterns, time, education level, and context. Males and females are more similar than different on all constructs assessed, for most grade levels and contexts. However, males report moderately more positive affective attitudes, higher self-efficacy, and more frequent use. Females are slightly more positive about online learning and appear to perform somewhat better on computer-related tasks. The results must be interpreted with caution because of methodological limitations in many studies reviewed. Finally, a model is proposed to understand and address gender differences in computer-related behaviour.

INTRODUCTION

A reasonable argument could be made that computers are integrated into every major area of our lives: art, education, entertainment, business, communication, culture, media, medicine, and transportation. It is equally reasonable to assume that considerable power and success rests with understanding how to use this technology meaningfully and effectively. Many children start interacting with computers at three to four years of age, however, gender-based socialization begins much earlier when someone asks, "Is it a boy or a girl?" (Paoletti, 1997). A critical question arises as to whether computer behaviour is influenced by gender. Given the prominent role that computers play in our society, it is vital that males and females have equal opportunity to work with and benefit from this technology.

Numerous studies have investigated the role of gender in computer behaviour over the past 20 years (see AAUW, 2000; Barker & Aspray, 2006; Kay, 1992; Sanders, 2006; Whitley, 1997 for detailed reviews of the literature) and the following conclusions can be made. First, most studies have looked at computer attitude, ability, and use constructs. Second, clear, reliable, valid definitions of these constructs are the exception, rather than the rule. Third, roughly 30% to 50% of the studies report differences in favour of males, 10% to 15% in favour of females, and 40% to 60% no difference. Fourth, differences reported, while statistically significant, are small. Overall, one could say there is a persistent pattern of small differences in computer attitude, ability, and use that favours males; however, considerable variability exists and has yet to be explained.

There are four main objectives for this chapter. First, past research on computers and gender will be summarized by examining the results of five previous literature reviews. Second, a more current analysis of gender and technology will be provided by looking at a comprehensive set of studies done over the past 10 years. Technology changes quickly, so might the attitudes and abilities of people who use this technology. Third, a clear emphasis will be placed on examining the impact of contextual issues (e.g., type of technology used, age group, setting, culture) in order to explain some of the variability observed in past research. Finally, a model for understanding gender differences in computer behaviour will be proposed to help set an agenda for future research.

BACKGROUND

At least five comprehensive reviews have been done examining various aspects of gender and the use of computers (AAUW, 2000; Barker & Aspray, 2006; Kay, 1992; Sanders, 2006; Whitley, 1997). Each review is well worth reading and of-

fers detailed, insightful information about gender and technology. I offer a brief synopsis of key insights these authors make that help frame the ideas presented in this chapter.

Whitley Review

In 1997, Whitley did a metaanalysis involving 82 studies and 40,491 American and Canadian respondents from 1973 to 1993. Regarding computer attitudes, it was found males had more positive affective attitudes toward computers. Mean effect sizes ranged from .08 for grammar school students, .22 to .24 for college students and adults, and .61 for high school students. Note that Cohen (1988, 1992) suggests that an effect size of .10 is small, .30 is medium, and .50 is large. This means that gender did play a moderate to significant role with respect to liking computers in the early period of computer use in North America.

General cognitive attitudes or beliefs about computers appeared to show little gender bias, with effect size ranging from .04 (college students) to .20 (grammar school). However, when focusing on computer-based stereotypes or sex biases, males were substantially more biased in their attitudes with effect size ranging from .44 (college students) to .67 (grammar students).

Self-efficacy toward computers followed a similar pattern to affective attitudes. Effect size was not substantial for grammar school students, but favoured males in high school and beyond ($r=.32$ to .66). Even though males reported more confidence in using computers, effect size for computer experience was relatively small ($r=.15$ to .23). Finally, it appears that males used computers more often than females for all ages groups ($r=.24$ to .40), although this effect size range would be considered moderate according to Cohen (1998, 1992).

In summary, Whitley offers a statistical snapshot of male-female differences in computer attitude, ability, and use for North Americans prior to 1993.

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