

# Men's and Women's Attitudes Toward Computer Technology: A Comparison

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*This study examined three research questions that compared the attitudes of men and women about (1) the value of technology in making users more productive, (2) the impact of computer technology on people and their work environments, and (3) the relative comfort of men and women when using computers. The study used an attitudes inventory constructed to identify attitudes associated with gender issues reflected in the literature. The inventory was administered to 62 subjects who were students in a university business communication course.*

*Analyses of the findings indicate that, contrary to earlier studies on these issues, women reflected more positive attitudes than men on all three scales. Females held more positive attitudes than males regarding the value of computers to make users more productive. Although neither men nor women in this group reflected concern about the impact of technology on people and their work environments, women were more positive than men in this regard. Women also reflected greater comfort in using computers than men.*

*The results carry implications for both education and business. Educators, trainers, and managers should reexamine their behaviors as they make decisions regarding career choices, on-the-job training opportunities, and job placement. Previous indicators that men are more receptive to technology in learning and training environments appear to have changed.*

The effect of exposure to computer technology and the idea that men and women differ with regard to their interest in and reaction to technology has received increasing attention among educators and scholars.

*American Demographics* reported that while female users of office personal computers (PCs) believe computers are fun, men buy the machines (Kaplan, 1994). Men, on the other hand, are reportedly more interested in mastering computer commands and want computers with voice recognition and features that extend their senses. Women want to be able to use the machines; men want to command the machines.

This difference in attitude about computer technology based on gender has been explained by some individuals as an outcome of the socialization process. Society views computers as highly technical and part of a male domain (Campbell & McCabe, 1984; Lowe & Krahn, 1980).

An individual's attitude is an important variable in the learning process. Yet, according to Gattiker & Hlvaka (1992), research assessing the relationship between attitude and learning performances in computer classes is lacking. Their hypothesis was based on three previous findings:

1. Substantial individual variation occurs in the perception of identical tasks, work situations, and technology's effect upon work.

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2. There is substantial evidence that negative attitudes toward a situation negatively affects learning.
3. The degree to which a person in the work place effectively applies knowledge and skills obtained through formal training is largely dependent upon the subjects' attitudes toward training (Gattiker & Hlavka, 1992).

Early literature from the 1980s points to more positive attitudes towards computer technology among males. Recommendations from those studies suggested increased exposure for females and identified specific ways to change the attitudes of females.

At present, computers have emerged in schools at all levels in increasing numbers. As a result, current students have had far more exposure to the computer than the subjects studied in the 1980s. This is substantiated by several research findings reported by Deloughry (1996). For instance, officials at 660 college campuses reported that one in four courses used electronic mail in 1997, up from one in five in 1995. Computer simulations, multimedia materials, and CD-ROMs have increased as well, but not as rapidly. Technology centers to assist students at public universities were found at more than 75% of public universities. This increase in exposure should be reviewed to determine if there has been an accompanying change in attitude between the genders.

## Problem and Purpose

Although females have been seen as being less receptive to technology than males, recent experiential evidence and increased computer use suggest that this condition may no longer exist. Therefore, this research attempted to determine whether males and females exposed to regular technology use for practical applications differ in their attitudes about technology. Three research questions were identified for this study of gender attitude about computer technology:

- RQ<sub>1</sub> Do men and women differ in their perceptions regarding the value of

computer technology in making users more productive?

- RQ<sub>2</sub> Do men and women differ in their attitudes toward the impact of computer technology on people and their work environments?

- RQ<sub>3</sub> Do men and women differ in their relative comfort when using computers?

The purpose of this study is to contribute to a better understanding of the current status of men's and women's attitudes toward computer technology. Because educators, business trainers, and business managers are influenced by prevailing assumptions as they interact with students and employees, they need to know whether past conditions still exist. Such knowledge may affect educators' recommendations to students regarding course, program, and career selection. Popular assumptions about the lack of interest in technology by women may cause educators to steer women away from technical courses and careers. Knowledge about current conditions may also influence trainers' and managers' recommendations to employees regarding the training and employee development activities that they pursue. Female employees may be bypassed in the selection process for employee development programs that involve technology.

## Review of Literature

This review of literature examined gender as it relates to computer attitude.

The pervading theme of research results regarding gender and the measurement of intellectual abilities is that gender is not an important variable; however, researchers have reported gender difference in attitudes toward computers in various environments (Jacklin, 1989). The earliest research that examined attitudes toward computers was conducted by Lee (1970). He identified two dimensions of attitude: (1) beliefs in the computer as a beneficial tool and (2) beliefs that the computers are autonomous entities. Lee's conclusion has been supported by

Cancro & Slotnik (1970) and Gardner, Young, & Ruth (1989).

Lee (1970) hypothesized that lower autonomous entity attitude scores would result in an increase in computer use which would in turn result in higher beneficial tool attitudes. He concluded that the driving factor in determining computer use was beneficial tool attitude. This finding can be extended to an explanation of the attitudinal processes involved in the introduction to all forms of technology. Individuals are likely to be apprehensive when they meet any new technology. As they familiarize themselves with it and adopt it, they realize its inherent utilitarian value.

Early studies of elementary and high school students identified an apparent dominance of males with regard to computer use and positive attitudes about the computer. An explanation for this gender difference may have evolved because computers were identified with math and science; and females saw themselves as lacking basic abilities necessary to succeed in such environments (Dambrot, Watkins-Malek, Silling, Marsh, & Garber, 1985). Others attributed the difference to lack of access to computers by females (Lieberman, 1985; Kiesler, Sproull, & Eccles, 1985; Goodwin & Wilkes, 1986; Marshal & Bannon, 1986; and Muira, 1987). Not all studies drew this conclusion, however. Wu and Morgan (1989) found that the relationships between the amount of computer use and attitudes about the computer were not especially strong.

Over the years, gender issues related to various academic specialties have been debated in the literature. When computers were introduced to the classroom in the 1980s, researchers sought to determine whether the gender of a student made a difference in performance on or preference for computers. Lockheed and Frakt (1984) saw the use made of the computer as the significant factor. Adolescent girls liked software applications while boys preferred programming activities. Daiute (1984) concluded that students with keyboarding skills make better use of word processing. Subjects with keyboarding preferred word processing tasks over those that required using paper and pencil.

These students, mainly women, would have a greater incentive to use computers. Kantrowitz (1994) affirmed this finding when she indicated that men tended to be seduced by the technology, while women appreciated the practical application of computers and software for meeting needs.

Greber (1990) suggested that females had opted out of the computer field for a variety of reasons: gender-inappropriate software, sex-role stereotyped games, games focused on violent examples, and a lack of female protagonists. The conclusion was that educational programs should provide skills and confidence for creative change within the new sociopolitical arrangements created by computers. As Greber pointed out, technology is never produced in a vacuum but in a particular social and economic context, one that can be changed by social and political action. However, this study dealt with computers as a career field, not comfort level with computers as tools.

Another factor studied was the context in which computer skills were acquired. For students who learned technology in carefully structured classroom situations, Smith (1986) found that the differences between genders disappeared; but when structure was not present, the differences between the genders increased with age.

At the college level, Arch & Cummins (1989) found little or no difference between the attitudes of the genders in classrooms where an integrated, structured introduction to computers was provided. But with regard to attitude about the computer, Williams, Ogletree, Woodburn, & Raffeld (1993) found that only past computer experience related to positive computer attitude scores.

Gattiker & Hlavka (1992) found no gender differences when comparing attitudes of computer owners. The decision to own a computer was viewed as self-socialization. However, as they pointed out, increased access to computers at work may have lessened the value of ownership as a basis for comparison.

In a study of computer anxiety in college students, Raub (1982) evaluated eight independent variables and found five to be significant including gender. Separate analyses for each gender uncovered different combinations of predictor variables, suggesting that computer

attitudes are gender specific and culturally learned. Sacks, Bellisimo, & Mergendoller (Winter, 1993-94) concluded that male attitudes about computers were stable across their experiment and that change would not be expected because the males have been socialized by a society that encourages males to be proficient in all technological issues. Females, on the other hand, have not been so encouraged; but when they are provided with computer instruction and experience, their attitudes and behaviors are not different from males.

While a few studies contradict the general consensus in the literature, most conclude that males (1) have a more favorable attitude toward computers, (2) perceive computers will be a career asset, and (3) demonstrate greater interest, participation, and competence in computing. According to Williams et. al, (October, 1993), this tends to be consistent across age groups from elementary to college students.

## Method

This study was part of a larger study by Sormunen and Ray (1996) that focused on collaborative writing by subjects who used networked computers. Subjects in the study were students in three sections of a one-semester business communications class at a Midwestern university. All students were engaged in team projects—problem solving,

case analyses, and collaborative writing—throughout the semester. The group contained 26 males and 36 females for a total of 62 participants who were sophomores, juniors, or seniors. Approximately half of the students were business majors; the others represented various programs throughout the university.

## Environment

All of the students used computers regularly (in class and outside class) throughout the term. Subjects in the study used computers in class for collaborative writing projects. Working in teams, each team member provided portions of reports and other documents for which he or she was responsible. Collaboratively, the teams critiqued, edited, and revised the documents. Students also used computers outside of class to write, edit, revise, and produce final copies of all writing projects.

**Figure 1: The Inventory Instrument\***

### ***How Do You Feel About Technology?***

React to each of the following statements by circling the number that represents the level of your agreement with the statement—on a scale that ranges from *Strongly Agree* (5) to *Strongly Disagree* (1). There is no “right” or “wrong” answer. Just be honest about your feelings.

#	Statement	Strongly Agree				Strongly Disagree
1	Computers and technology have made students more productive.	5	4	3	2	1
2	Technology is demoralizing; it takes the human element out of work and life.	5	4	3	2	1
3	Gathering data for class assignments is simplified by using computers.	5	4	3	2	1
4	I am comfortable when using computers for student assignments.	5	4	3	2	1
5	I prefer getting information from a printed page instead of a computer screen.	5	4	3	2	1
6	The frustrations created by computers are more trouble than they are worth.	5	4	3	2	1
7	The University spends too much money on computers and communication technology for students.	5	4	3	2	1
8	Because computers and other technologies have all but eliminated the need to write on the job, writing is no longer a critical skill.	5	4	3	2	1
9	Technology frees people from tedious work allowing them to concentrate on more difficult tasks.	5	4	3	2	1

\* These nine items were among the items on a much longer inventory used by Sormunen and Ray (1996) for another study.

### **Instrument**

In the absence of an existing instrument that measured attitudes related to the three research questions, potential statements for an inventory were generated. A panel of four educators reviewed the items and made suggestions for revising the list and editing the wording.

Nine statements were selected to comprise an inventory (See Figure 1) to answer the research questions in this study. The items contained positive and negative statements about the value of technology, the impact of technology on people, and participant comfort levels with technology. The nine Likert-scaled items employed phraseology relating to student and work environments. The inventory was administered near the end of the term.

The subjects' ratings were summed and averaged to provide three scales that were used to examine the three research questions. The first scale, which consisted of three items, measured the subjects' perceptions regarding the value of computer technology in simplifying tasks and making users more productive. This scale was constructed so that the larger the value, the more positive the attitude toward technology. The second scale, which consisted of four items, measured the attitude toward the social impact of technology. This scale was constructed so that the smaller the value, the more positive the attitude toward technology. The third scale, which consisted of three items, measured comfort levels associated with computer use. This scale was constructed so that the larger the value, the more comfortable the subject was with computers.

### **Statistical Analyses**

Three scales, combining related items from the inventory (See Figure 1), were used. Each scale was tested for reliability, using the Cronbach Alpha. The first scale (Items 1, 3, and 9), the measure of attitude toward computers' contribution to productivity, resulted in a Cronbach Alpha score of .6159. The second scale (Items 2, 6, 7, and 8), the measure of attitude toward the impact of computers on people and their work environments, resulted in an

Alpha score of .7027. The third scale (Items 4, 5, and 6), the measure of comfort level with computer use, resulted in an Alpha score of .6288. While these scores are not high, they were considered adequate to assume that the scales were replicable.

To test the research questions, t-tests were calculated using the three summated scales as the dependent measure and gender of the subjects as the independent measure.

### **Findings and discussion**

The following analysis presents the findings for each of the research questions. For each research question the analysis of subjects' responses and the significance of differences between male and female subjects are reported.

#### **Computer Contribution To Productivity—RQ<sub>1</sub>**

*Do men and women differ in their perceptions regarding the value of computer technology in making users more productive?*

Using an alpha level of .05, a computed t-value of -2.15 indicates that there is a significant difference between the mean levels of males and females (see Table 1). Women produced higher means than men. Table 1 presents the statistical analyses of inventory items that involved perceptions about the value of technology in making users more productive.

**Table 1: Male and Female Attitudes Toward The Value of Computer Technology for Making Users More Productive**

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	26	4.0641	.618	.121
Females	36	4.3426	.402	.067
t value	Degrees of Freedom	2-tail Probability		
-2.15	60	.036		

Examination of the means reveals that both the males and the females had mean values above 4.00 on this scale. Since a higher value on this scale indicates a more positive perception toward

the increased level of productivity afforded by computer technology, one may conclude that both males and females viewed the computer as a tool that helps raise productivity. However, there appears to be a gender difference on this scale, indicating that the females in this study regarded the computer more highly as a productivity enhancing tool. This is counter-indicative to previous studies that showed either no gender differences in this perception or that males tended to have a more positive attitude in this perception (Arch & Cummings, 1989; Gattiker & Hlavka, 1992). Lee (1970) indicated that as individuals familiarize themselves with new technology, they will be apprehensive initially and then realize that it is a beneficial tool. Increased access to computers for all students and structured information about computer use for classes have provided an environment where gender differences could disappear.

### ***Impact of Computers On People and Their Work Environments—RQ<sub>2</sub>***

*Do men and women differ in their attitudes about the impact of technology on people and their work environments?*

Neither men nor women showed high degrees of concern about the impact of computers and technology on the work environment, as indicated by mean scores of 2.06 and 1.57 for men and women, respectively, when reacting to negatively worded statements. However, the level of disagreement by women was significantly different from men. In other words, women showed significantly less concern than men about this issue. Table 2 presents the statistical analyses of inventory items that involved the impact of

**Table 2: Male and Female Attitudes Toward The Impact of Technology on People and Their Work Environments**

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	26	2.0577	.715	.140
Females	36	1.5694	.446	.074
t value	Degrees of Freedom	2-tail Probability		
3.31	60	.002		

**Table 3: Computer Comfort Levels of Males and Females**

Group	Number of Cases	Mean	Standard Deviation	Standard Error
Males	26	3.5128	.756	.148
Females	36	3.9907	.475	.079
T Value	Degrees of Freedom	2-tail Probability		
-3.06	60	.003		

technology on people and their work environments.

Using an alpha level of .05, a computed t-value of 3.31 indicates that there is a significant difference between the mean levels of males and females. Women produced lower means (a more positive attitude) than men. The generally higher comfort level of females with computers (RQ<sub>3</sub>) may account for their failure to see technology as having a negative impact on people and organizations. This supports the findings of Sacks, Bellissimo, and Mergendoller (Winter, 1993-94) that women, when provided computer instruction and experience, change both their attitudes and their behaviors. As Greber (1990) pointed out, computers create new social and political arrangements. Apparently women are now more comfortable with the changes that technology has created in the social and political scene.

### ***Computer Comfort Level—RQ<sub>3</sub>***

*Do the comfort levels associated with computer use differ for men and women?* Table 3 presents analyses of inventory items that involved males' and females' comfort levels associated with technology.

Using an alpha level of .05, a computed t-value of -3.06 would indicate that there is a significant difference between the mean levels of males and females. Examination of these means shows that women had a higher mean than did the men. Women, therefore, felt more comfortable with technology than the men.

The review of literature leads one to believe that men have a more positive attitude about

using computers than women. Historically, most studies have pointed to differences in the way students have responded. Because of the positive attitude males held, they spent more time on the computer and consequently seemed to be more confident about or willing to use the computer.

As computer use became more prevalent in both the classroom and the work environment, one would expect differences in gender attitudes to have disappeared. This was affirmed by Smith (1986) and Arch & Cummins (1989) who found that when computer skills were acquired in a carefully structured learning experience, gender differences were not significant.

At the present time, computer use in university classes has provided equal opportunities for exposure to technology for both genders; consequently one would not expect to see gender differences in the way students view computers. Nevertheless, this study indicates that women now are more comfortable than men with computers. One explanation for this finding may reflect research by Lockheed and Frakt (1984) on the use of the computer. They found that word processing or other practical uses of technology would be viewed more favorably by women than men. As Kaplan (1994) pointed out, men want to command the machine and its features, but women want to be able to use the machines.

## Conclusion

The data support the conclusion that females are more positive about computers than males. The differences are significant for all three research questions in this study. Not only do women regard the value of computer technology as a way to simplify tasks and to increase productivity, but it also presents evidence to support the belief that women have become more comfortable with technology, removing a stumbling block to opportunities related to technology.

## Implications

Clearly the results of this study have implications for both education and business, as well as for further research. Given the shift in attitudes by females from negative to positive, educators

should recognize that females, as well as males, are suited for a full range of technology courses. Because females have a higher regard for the contribution of technology to productivity improvement and are more comfortable with technology than men, they should be encouraged to pursue technology-related careers. In employment situations, managers should be encouraged to use both males and females for technology assignments, training opportunities, and employee development activities. Their positive attitudes and comfort levels with technology may make women especially adept at creative applications of technology.

Because these findings are contradictory to others found in the literature, replication would be useful. Inclusion of different ages or experience levels would be insightful. Replication in the work world may be particularly helpful in determining whether biases exist because of management perceptions about gender and the use of technology. We believe that the perceptions of management about technology and gender are pivotal when diversity issues are involved.

Additional research on these and other topics will assist individuals responsible for training in either academic or work environments to plan effective, pertinent instruction about technology.

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