

21st Century End-User Attitudes Toward Information Technology

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ABSTRACT

This research is a study of 21st Century end-user attitudes toward information technology within a large service organization in South Florida. Myriad of literature on computerphobia and negative end-user attitudes toward computers and information technology dominated the discipline of information technology from approximately 1980 to 1997. The purpose of the study is to examine if end-user attitude have changed. Demographic variables are used as moderators to examine if there is any correlation between the demographics and the end-user attitudes of the respondents.

Keywords: user attitude, information technology, computerphobia

INTRODUCTION

This study was conducted for the purpose of identifying and comparing the attitudes of 21st Century end- users towards computers and information technology. A sample of the population was surveyed within a large service organization in South Florida. The participants consisted of managers, human resources, administrative and accounting personnel within the corporate headquarters and one regional office. Additionally, the study examined if gender, age, and education have any influence on end-user attitudes. An end-user attitudes survey was implemented to measure the respondents' attitudes toward computer usage. The instrument was a questionnaire developed by Culpan (1995) for the purpose of measuring end-user attitudes toward computers.

One of the most significant challenges faced by 21st Century organizations is the acquisition of employees who are not only literate with the existing state of the art information technology, but also will have the capacity to learn and use future innovative computer technologies, which are expected to be developed in the future. With the help of information technology experts, managers in the new millennium may be better able to choose the right employees, and to place them in positions, which are compatible to their present level of computer skills and be able to train them to learn any and everything that is a new innovation in the future. Employees, who are the right "fit" may respond by being more achievement motivated to perform their tasks effectively and efficiently.

Many end-users have little technical knowledge of computers and are likely to experience computer anxiety and negative attitudes if expected to suddenly perform a considerable amount of their work on new software. A study by Murrel and Sprinkle (1993) examined the impact of negative computer attitudes on employees' satisfaction and commitment. The results of the study indicate that approximately one-third of the respondents felt incompetent in their ability to use computers, and almost a quarter of the respondents did not want any involvement with computers (Murrel & Sprinkle, 1993). The results of this study also related the respondents' frustration with computers to job attitude and feelings and commitment to their organization (Murrel & Sprinkle, 1993).

Differences in information technology skills, which exist between managers, supervisors and coworkers, may significantly affect workplace efficiency and effectiveness. Research studies support a number of instruments which are able to measure end-user attitudes toward computers. These instruments may have the ability to help employers identify desirable attitudes and behaviors towards computer and computer technology. Managers may be expected to apply this knowledge, along with the use of enhanced interpersonal skills, to improve and to maintain employee performance.

Specifically, current research reasons that as individuals gain experience with computers they develop certain attitudes about them, which may be favorable or unfavorable. (Gardner, Dukes, & Discenze, 1993). A meta-analysis by Kay (1993) identifies 15 different constructs to measure individual attitudes towards computers, however only recent studies have researched interventions to computer negativity. In this age of keen competition, the majority of organizations are struggling to manage their numerous resources in order to keep their businesses profitable. Material wealth is driving factor of the new millennium, yet one of the more important aspects of an organization's resources is the workforce, which has the ability to make the organization profitable or unprofitable. Modern day managers are expected to recognize changes in the attitudes and the needs of their subordinates, and to provide the tools and create working conditions conducive to their employees' interests for the ultimate benefit of both the employees and the organization.

Research Questions and Hypotheses

1. Have end-user attitudes toward computers changed in the 21st Century?
2. Does age influence end-user attitudes toward computers?

The hypotheses are:

H1: End-users in the 21st Century have more positive attitudes toward computers.

H0: End-users in the 21st Century do not have more positive attitudes towards computers.

H2: There is a significant relationship between the age of the respondents and end-user attitudes toward computers.

H0: There is not a significant relationship between the age of the respondents and end-user attitudes toward computers.

LITERATURE REVIEW

The immediate purpose of the study was to measure 21st Century end-user attitudes toward computers, and to identify if gender, age, education or job type of the respondents' influences attitudes towards computers either negatively or positively. The literature reviews the attitude-behavior theory of Fishbein and Ajzen (1975). The attitude-behavior theory of reasoned action has been used mainly in the discipline of psychology. The theory has been validated in studies of managerial attitudes toward computer information systems (Gardner, 1993).

Positive And Negative End-User Attitudes

In the Fishbein and Ajzen (1975) model, individual viewpoints or beliefs about objects lead to attitudes towards them. These viewpoints or beliefs may arise from experiences or what others say. If an individual's viewpoint or belief is positive, then attitude is also positive. Attitudes, in turn, may lead to certain behavior patterns towards an object such as a challenge to pursue or something to avoid. Consequently, these behavior patterns or intentions affect the individual's actual behavior towards the object. Behaviors in turn affect beliefs and are able to modify an individual's viewpoint towards an object.

Fishbein and Ajzen (1975) hypothesized that manifesting a certain behavior about an object reinforces individual attitudes, however behaviors that are not reinforced may change an individual's beliefs either positively or negatively, and subsequently individual attitudes about an object may also change. If individual experiences with the object are favorable, then beliefs about the usefulness of the object may be reinforced (Fishbein & Ajzen, 1975). Likewise, if individual experiences with the object are unfavorable, then beliefs and attitudes toward the object are negatively reinforced (Fishbein & Ajzen, 1975; Fishbein, 1979).

These relationships form the basic hypothesis in the present study. Hundreds of researchers define computerphobia as negative computer reactions or computer anxiety, cyberphobia, technophobia, or more commonly, negative computer attitudes (Weil, 1990). "Understanding how attitudes towards computers may affect an employee's work attitude is definitely a major concern of researchers," (Murrel & Sprinkle, 1993, p. 57) managers and human resources practitioners.

Today in the 21st Century, the majority of Americans no longer work in factories, instead holding jobs in service organizations and the impact of computer innovation is very apparent. It is difficult to conceive how any business, organization, or educational institution could do without computers and go back to doing things “the old way”; however research indicates people have not exactly embraced computer usage.

Glass and Knight (1988) state that despite the proliferation of computers and the information and efficiency of production that computers bring, many people are anxious about using them and such behavior leads to avoidance of computers and inhibits the ability to develop competent computer skills. At a time where computer use is now the norm rather than the exception, this researcher is curious if computer attitudes have changed. Specifically, have individual attitudes become more positive about computers and computer technology and do end-users have more technical knowledge of computers than twenty years ago?

Furthermore, Gutkin (1985) hypothesized that individuals working with computers might be affected psychologically and sociologically. Gutkin (1985) observed that as new innovations in information technology was becoming available at more affordable costs, individuals were becoming more and more dependent on computers, and he was concerned that computers could increase individuals’ own perfectionistic expectations of themselves as to efficiency and effectiveness in the workplace; raising concerns that computers might widen the educational gap between classes, cultures, and high and low achievers.

Sproull, Zubrow, and Kiesler (1986) conducted a study of freshmen at two universities examining responses about computer science courses compared to other freshmen courses; finding that a majority of the students reported reality shock regarding their computing courses. The study also found that “this pattern was less typical of students in the teaching-oriented university than in the research-oriented one” (Sproull, et al, 1986, p. 256). Furthermore, the study revealed that three factors led to fewer negative attitudes: “being male, having taken a computing course in high school, and majoring in science or engineering in college” (p. 256). However, the study revealed that even these students thought of computing as an alien culture (Sproull, et al, 1986).

In 1989 a study by Temple and Lips (1989) measured gender differences in computer attitudes among students at the university level. It was found that male students had a greater interest in computers, were more knowledgeable about computer languages, and more likely to be information technology majors. Furthermore, the study revealed that the female students, in general, thought themselves just as capable as men of learning and using computers, while the male students expressed the opinion that women were less capable of learning and using computers (Temple & Lips, 1989). There is a considerable amount of research to show that women are considerably less likely than men to be information technology majors and to graduate from college (Temple & Lips, 1989).

Weil, Rosen, and Sears (1987) identified three types of computerphobia: The anxious Computerphobics demonstrate physical anxiety traits such as sweaty palms and heart palpitations; the cognitive Computerphobics experience internal fears and phobias about their incompetence; and uncomfortable users, people that have mild anxieties and negativity towards computers.

Allwood and Wang’s study (1990) examines the computer attitudes of Chinese and Swedish psychology and computer science students through the administration of a 23-item questionnaire translated into Chinese and Swedish. The results of the study indicate differences in perceptions towards computers between the two countries, but not between the two major disciplines (Allwood & Wang, 1990). Additionally, the study revealed that the Chinese students were more optimistic about the value and impact of computers on society (Allwood & Wang, 1990).

Farina, Arce, Sobral and Carames (1991) conducted a study of a population of 162 university students of equal gender to examine the relationships between anxiety towards computers and the variables of trait anxiety, and anxiety towards mathematics. The results of the study supported other studies that females were more computer anxious than males and that all the trait variables were influencers of computer anxiety (Farina, Arce, Sobal and Carames 1991).

However, Pope-Davis & Twing (1991) measured the effects of age, gender and computer experience on attitudes towards computers using a sample of 275 college students. The Computer Attitude Scale (CAS) was used to assess the students' attitudes towards computers and computer use. The study found that females were equally as interested in computers as males and that the respondents were generally positive in their attitudes towards computers (Pope-Davis & Twing, 1991). This 1991 study appears to be the turning point towards the majority of the population having a more positive attitude toward computers.

Two studies conducted by Pancer (1992) "demonstrate that in order to understand specific behaviors it is necessary to examine the beliefs that underlie attitudes towards those behaviors" (p. 221). This research is very relevant as it reinforces the trend away from gender based computer anxiety and towards training individuals to use computer technology. Up until this time, little research has been done on computer attitude interventions. Subsequently, this research is further reinforced by a study by Pope-Davis & Vispoel (1993), which "assesses the influence of micro-computer training on attitudes towards computers" (p. 83). The Computer Attitude Scale developed by Loyd & Loyd (1985) was used to examine a population of 195 students who either had or had not taken a micro-computer course (Pope-Davis & Vispoel, 1993). The results of the study indicate that attitudes toward computers can be improved with instruction (Pope-Davis & Vispoel, 1993).

A considerable amount of research studies have since indicated that computer training is constructive in developing positive attitudes toward computer usage; however, an equal amount of research says that it is difficult to change the negative opinions of the Computerphobic (Murrel & Sprinkle, 1993). Studies in the field of computerphobia parallel studies in related fields of math anxiety and test anxiety (Glass & Knight, 1988). Other studies show that although Computerphobic individuals can adjust to the software they are using, they may need a readjustment period again in the future if the software changes drastically, and the readjustment period might be very slow (Murrel & Sprinkle, 1993).

Summary Of Literature Review

The above literature review provides a background of the literature of computerphobia, computer anxiety, and end-user attitudes, and suggests that individuals with positive attitudes towards computers visualize the computer as a tool to assist in making work easier, while individuals with negative attitudes towards computers see information technology as an enemy (Farina, 1990).

Employers are increasingly concerned about hiring the right employee for the job. Training and experience with computers is emerging as one of the most important variables for predicting anxiety towards them, more training and experience leading to less anxiety (Glass & Knight, 1988; Harrington, 1988; Howard, 1986; Jones & Wall, 1989-1990). Further research into employee personality and behavior may offer some new challenges and help overcome computer anxiety.

METHODOLOGY

The following will define the research design and methods for this study. More specifically, it describes the sample and corresponding population, survey instruments and distribution, research variables and operational definitions, research questions with respective hypotheses and analyses, procedures, research and design, and an outline of data collection methods to be utilized.

Subjects

The population selected for this study consisted of managers, human resources, administrative and accounting personnel within the corporate headquarters and one regional office. The sample was not selected randomly, but was selected intact. The participants were employees who attended a new benefit orientation, and no consideration was given to age, gender, education, longevity, cultural background or job position of the participants. Those employees who were too busy or not interested enough to attend the orientation were not solicited with the questionnaire. Although the company surveyed consisted of approximately 2,300 employees, only a sample of the

corporate office and one regional office was chosen because the employees are easily accessible, and most used computers on the job.

Instrument

The researcher assessed several instruments for measuring end-user attitudes toward computers. Due to time constraints, a questionnaire developed by Culpan (1995) for the purpose of measuring end-user attitudes toward computers was selected. Culpan (1995) used this questionnaire in a relatively large study of 25 manufacturing and 25 service organizations randomly selected within Pennsylvania. “Reliability test of measurements yielded 0.92 for questions regarding computer use at work and 0.89 for questions concerning user attitudes” (Culpan, 1995, p. 170).

The first thirteen items of the questionnaire, which focused on selected business characteristics, were eliminated because the sample involved only employees within one organization. The remaining 28-item questionnaire consisted of eight items soliciting the demographic characteristics of the participants; eight items asking about computer-hardware, software, and computer usage; and eleven Likert-type scale items with answers ranging from 5 (strongly agree) to 1 (strongly disagree) (Culpan (1995). These eleven questions solicited each participant’s attitude toward computers and computer usage (Culpan (1995). The last item of the questionnaire was a fill-in-the-blank asking the participant for what other purposes computers were used. See Appendix A.

Moderator Variables

Demographic variables were considered as moderator variables in this research. Although a wide variety of demographic variables were considered, due to time constraints, only demographic variables of gender, age, and education were chosen as the most likely to influence the outcome of the survey. Most research in the area of computerphobia and end-user attitudes toward computers have centered on these three demographic variables. The demographic variables were presented on the cover page of the questionnaire. Respondents were given boxes to check. Numbers from 1 to 5 were assigned to all possible responses, depending on how many responses were possible for each variable.

Reliability Of Measure

Reliable measurement was examined for the eleven Likert-type items of the questionnaire to determine the accuracy or precision of measuring end-user attitudes toward computers. Cronbach’s alpha for the study was used to determine reliability. Reliability coefficient alpha for the full study (n = 75) using the instrument of measure consisting of a combined total of 11 items was .7327 indicating a fair reliability score.

The scale used in this survey proved reliable with a coefficient alpha of .7327.

Table 1
Reliability α Coefficient for the Likert-type Items
(N = 75)

| | Alpha | N Items |
|----------------------------|--------------|----------------|
| End-users Attitudes | 0.7327 | 11 |

Validity Of Measures

The measurement scale for the instrument has been validated by extensive research in similar populations since 1995.

Procedures

Eighty surveys were hand-distributed to employees at two separate orientation sessions. One session was held in the corporate office in Hollywood, Florida and the second session was held the following day in the Regional office in Kendall, Florida. Instructions on the survey asked participants to either leave the surveys on the table in the training room or to drop them off in the Human Resources Department. A total of 75 surveys were returned. Consequently, the returned 75 surveys were 94 percent of the surveys distributed. Data analysis has been conducted through SPSS. Each returned survey was coded for input directly into SPSS. The data was cleaned by visual examination for irregular input values, and frequencies and descriptive statistics were calculated for all variables, including means, standard deviations where appropriate.

RESULTS AND DISCUSSIONS

The results of the statistical procedures and data collected to examine end-user attitudes toward computers and to understand relationships between the dependent variable and independent variables are examined in this chapter.

H1: Have end-user attitudes toward computers changed in the 21st Century?

In order to determine if the end-user attitudes of the respondents are more positive in the 21st Century, descriptives of the means of the items comprising the factor of end-user attitudes were calculated. The means of the items measuring end-user attitudes indicate that the majority of the respondents are positive in their outlook towards computers. Therefore, it can be concluded that the hypothesis is supported.

H2: Does age influence end-user attitudes toward computers?

In order to determine if the age of the respondents was related to the end-user attitudes of the respondents, the resulting scores for the instrument were correlated with the factors that composed end-user attitudes of the respondents. No significant correlation was found to exist between the ages of the respondents and the factor of end-user attitudes. Therefore, it can be concluded that the hypothesis is rejected.

The first hypothesis stating that end-users in the 21st Century have more positive attitudes towards computers was supported. It appears that 21st Century end-users are more familiar with computers and have less anxiety in computer usage.

The second hypothesis stating that there is a significant relationship between the age of the respondents and end-user attitudes toward computers was not supported. The Pearson correlation coefficient analyses indicated no correlation between age groups and computer attitudes.

This research follows a process of building knowledge in order to add to the discipline of Information Technology. Although this study is limited to one organization in the service industry, due care was given to the review of the literature, the gathering of the data, and the analyses of the data, development of the explanations of the relationships between the variables and the predictions and verifications of the results. Scientific research is a continuous process by which we learn. The additional support this research provides to the study of information technology is insignificant to say the least, but it is one study of many already achieved and perhaps will promote further interest in the discipline.

Further Study

This organization is prime for further study and a gold mine for areas of research. Property management in South Florida is a very lucrative business, however; because the organization's primary focus is on the tremendous and continuous growth indicative to the industry, until recently little attention has been paid to internal deficiencies until a major problem occurs. Management needs to become proactive and become concerned with efficient utilization of its resources, including human resources. Too often only critical issues are being addressed and the development of employees and more efficient methods of task performance are being ignored.

Other areas of research interest in this organization include the diversity of the workforce and the fact that more than 40 percent of the employees are over 40 years of age. Both these factors are popular areas of research and these relationships within the organization can be carefully examined through future research.

AUTHOR INFORMATION

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REFERENCES

1. Allwood, C. M. & Wang, Z. Conceptions of computers among students in China and Sweden. *Computers in Human Behavior*, Vol. 6, pp. 185-199, 1990.
2. Culpan, O. Attitudes of end-users towards information technology in manufacturing and service industries. *Information & Management*, Vol. 28, pp. 167-176, 1995.
3. Farina, F., Arce, R., Sobral, J. & Carames, R. Predictors of anxiety towards computers. *Computers in Human Behavior*, Vol. 7, pp. 263-267, 1991.
4. Fishbein, M., & Ajzen, I. *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley, 1975.
5. Fishbein, M. *A theory of reasoned action: Some applications and implications*. In H. Howel & M. Page (Eds.), Nebraska Symposium on Motivation p. pp. 65-116. Lincoln: University of Nebraska Press, 1979.
6. Glass, C.G., Knight, L.A. Cognitive factors in computer anxiety. *Cognitive Therapy and Research*, Vol. 12, pp. 351-366, 1988.
7. Gardner, D. G., Dukes, R. L. & Discenze. Computer use, self-confidence, and attitudes: A causal analysis. *Computers in Human Behavior*, Vol. 9, pp. 427-440, 1993.
8. Gutkin, T. B. The behavior sciences in the computer age. *Computers in Human Behavior*, Vol. 1, pp. 3-18, 1985.
9. Kay, R. H. An exploration of theoretical and practical foundations for assessing attitudes towards computers: The Computer Attitude Measure (CAM). *Computers in Human Behavior*, Vol. 9, pp. 371-386, 1993.
10. Loyd, B. H., & Loyd, D. E. The reliability and validity of an instrument for the assessment of computer attitudes. *Educational and Psychological Measurement*, Vol. 45, pp. 903-908, 1985.
11. Murrell, A. J. & Sprinkle, J. The impact of negative attitudes toward computers on employee's satisfaction and commitment within a small company. *Computers in Human Behavior*, Vol. 9, pp. 57-63, 1993.
12. Pancer, S. M., George, M. & Gebotys, R. J. Understanding and predicting attitudes towards computers. *Computers in Human Behavior*, Vol. 8, pp. 211-222, 1992.
13. Pope-Davis, D. B. & Twing, J. S. The effects of age, gender, and experience on measures of attitude regarding computers. *Computers in Human Behavior*, Vol. 7, pp. 333-339, 1991.
14. Pope-Davis, D. B. & Vispoel, Walter P. How instruction influences attitudes of college men and women towards computers. *Computers in Human Behavior*, Vol. 9, pp. 83-93, 1993.
15. Sproull, L., Zubrow, D. & Kiesler, S. Cultural socialization to computing in college. *Computers in Human Behavior*, Vol. 2, pp. 257-275, 1986.
16. Temple, L. & Lips, H. M. Gender differences and similarities in attitudes toward computers. *Computers in Human Behavior*, Vol. 5, pp. 215-226, 1989.
17. Weil, M. M., Rosen, L. D. & Sears, D.C. The computerphobia reduction program: Year 1. Program development and preliminary results. *Behavior Research Methods, Instruments, & Computers*, Vol. 19, pp. 180-184, 1987.
18. Weil, M. M., Rosen, L. D. & Wugalter, S. E. The etiology of computerphobia. *Computers in Human Behavior*, Vol. 6, pp. 361-379, 1990.

APPENDIX A

This survey is a requirement for my information technology class for Nova Southeastern University's Doctorate Program. It has nothing to do with XYZ Company. The objective of the survey is to measure end-user attitudes toward computers. Your view will be valuable in assisting me with an analytical research exercise to help me prepare for the Doctorate Dissertation due at the end of the Doctorate Program. Please fill out the survey and leave it on the table of the training room or drop it off in the Human Resources Department.

1. Gender: male female
2. Age: 20 – 29 30 – 39 40 – 49 50 – 59 60 - 69
3. Education: less than high school undergraduate degree
 high school master degree or higher
 some college
4. Type of job you hold: administrative support
 specialist
 accts receivable/payable/general ledger
 supervisor
 manager
 top level manager
5. Functional department in which you work: administrative support
 accounting
 human resources
 sales
 finance
 property management
 property services
6. Do you have a Personal Computer at home?
 yes How many PC's? ____ Laptops? ____
 no
7. Do you have access to the Internet from home?
 yes no
8. At work, do you use a Personal Computer or Laptop?
 yes no
9. What percentage of your daily work is performed on a computer?
 less than 25% approx. 50% 75% or more
10. How often do you use your e-mail at home?
 daily once a week once a month never
11. How often do you use your e-mail at work?
 daily once a week once a month never
12. What kind of package do you use most of the time?
 word processor graphics database spreadsheet
 networking combination others
13. How did you learn to use a computer?
____ By myself
____ By help of a colleague
____ In-house training
____ Outside training (company sponsored)
____ Outside training (non-company sponsored)
____ Combination

14. What are the major obstacles that you experienced in learning computer use?
 Initial fear
 Initial time of investment
 Unavailability of hardware
 Unavailability of instruction
 Others (please specify) _____
15. Do you find the package that you use
 friendly
 neutral
 unfriendly
16. What made you interested in using computers?
 job requirement
 my own interest
 influence of others at work
 influence of others out of work
 combination of above
 others (please specify) _____

Use the following scale to indicate your response to the following questions:

- (1) = Strongly disagree
(2) = Disagree
(3) = Not sure
(4) = Agree
(5) = Strongly agree

17. Using computers is a requirement for my job.
 (1) Strongly disagree
 (2) Disagree
 (3) Not sure
 (4) Agree
 (5) Strongly agree
18. Using computers is convenient for my job.
 (1) Strongly disagree
 (2) Disagree
 (3) Not sure
 (4) Agree
 (5) Strongly agree
19. Using computers is the best solution to my job problems.
 (1) Strongly disagree
 (2) Disagree
 (3) Not sure
 (4) Agree
 (5) Strongly agree
20. Using computers is a pleasure for me.
 (1) Strongly disagree
 (2) Disagree
 (3) Not sure
 (4) Agree
 (5) Strongly agree
21. Using computers helps me get a promotion.
 (1) Strongly disagree
 (2) Disagree
 (3) Not sure
 (4) Agree
 (5) Strongly agree

22. Using computers enhances my competence.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
23. Using computers causes stress for me.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
24. Using computers has increased my job productivity.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
25. I use computers for decision-making.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
26. I use computers for control over operation / activities.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
27. I use computers to speed-up data processing.
___ (1) Strongly disagree
___ (2) Disagree
___ (3) Not sure
___ (4) Agree
___ (5) Strongly agree
28. I use computers for other purposes.
Please specify: _____