Attitudes Towards New Technologies: A Student Perspective at Inter American University of Puerto Rico*

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ABSTRACT

The purpose of this study was to examine the attitudinal impact that technology, in particular computer-driven technology, has had and continues to have on students. A survey was administered to 280 students (10% of the target population). The hypotheses investigated were proven in that increased usage of technology amounted to increased comfort level with the usage of that technology; gender made no difference in computing attitudes towards the usage of contemporary technologies, and academic affiliation made no difference in computing attitudes towards the usage of contemporary technologies. This study contributed to a better understanding of technology usage among students.

PROBLEM

Technology is definitely not a new phenomenon; it has always existed. In its broadest sense, technology is the cumulative application of human knowledge and intelligence to solve problems and thereby improve our quality of life. Technology includes "things" as well as our social, economic, and political "institutions", which produce, and are affected by, technology (Ravich, 1998). Science and technology, once distinct, affect and are affected by each other to such an extent that the distinction between the two seems to be blurring. Existing technology now drives science just as science drives technology (Grant & Rarding, 1999).

As a result, our need to understand the changes in economic, social, and personal life wrought by technical innovation has an urgency above and beyond intellectual curiosity. Computers are already becoming personal implements for new kinds of work, business, and leisure activities (Smail & Kelly, 1994). The potential is there for emphatic improvement of the quality of life. However, the important, and often missing, element in overviews of technology is its connection to people. Thus, in order to rectify this deficiency, our study begins to address the vital connection that exists between computer technology and its users, in particular people's attitude towards technology.

PROBLEM BACKGROUND

Agreeing on a definition of technology that can be applied to all stages of history may be impossible. Early technology evolved primarily through accident and trial and error. While the fortuitous discovery of technology is still very important, contemporary

technology is mainly the result of a constantly expanding knowledge base (Anglin, 1991). Webster's' New Collegiate Dictionary defines technology as "...the totality of the means employed to provide objects necessary for human sustenance and comfort" and "a technical method of achieving a practical purpose." Although this very broad definition is for all intents and purposes very practical, it still does not accurately apply to all stages of history.

Furthermore, it is important to remember that different aspects of human life represent different needs, and appropriate technology varies accordingly. It is also safe to say that technology is more than applied science. It can be said that technology is the process by which humans have coped with and changed their environment throughout history. In this sense, people have always lived and worked in a "technological society." Never before, however, has technological change been so rapid or so broad in scope.

Today, the concept of an "educated person" includes an element of technological literacy. For this study we shall use Lisensky's definition which suggests that technology includes the tools that extend human capabilities, the systems within which the tools are used, and an approach to the management of the environment (Lisensky, 1985). This encompasses technologies such as computers, automated teller machines, and cellular phones. In contemporary society, the relationship of humans to computer technology is critical, and must be examined carefully in order for us to keep in perspective: 1, the scope of technological change, 2, the scope of its effects (global and beyond), 3, the complexity and interdependence of advanced technological subsystems, and 4, technology's value and place in society.

Technology and society are interdependent. Technology is not and cannot be independent from the society in which it is developed, for it is a social phenomenon. We bring about technological advances in response to our own technical and social needs. The characteristics of our society, including social, political, and economic forces, play a significant role in deciding and determining which technologies are developed and adopted. The value decisions made by our fellow human beings are also inherent in this process. Our value responses determine quality of life criteria, the degree to which the human element is preserved, and the potential to have the appropriate technology to help individuals, families, and institutions attain solutions to economic, social, environmental, and family problems (Weiser, 1995).

PURPOSE OF THIS STUDY

The purpose of this study was to examine through surveys the attitudinal impact that technology, in particular contemporary technology, has had and continues to have on students. The study describes the trends and attitudes towards contemporary technologies. The researcher then interprets relationships among variables from the study and the review of literature. Hence, the study and results obtained from the survey provide a framework for future research on factors that are likely to affect the effectiveness of contemporary technology integration.

RESEARCH QUESTIONS/HYPOTHESES

Research Questions

To what extent does the frequency in the use of a particular technology affect attitude and the likelihood of using that particular technology?

Does gender make a difference in the computing attitude towards the usage of contemporary technologies?

Does academic affiliation make a difference in computing attitude towards the usage of contemporary technologies?

Research Hypotheses

[H_{01}]: Increased technology usage will not result in increased comfort with the usage of technology.

[H_{02}]: Gender makes a difference in computing attitude towards the usage of contemporary technologies.

[H_{03}]: Academic affiliation makes a difference in computing attitude towards the usage of contemporary technologies.

LIMITATIONS

The scope of the study was limited to the Inter American University of Puerto Rico students as opposed to members of the general public for reasons of accessibility and limited time and resources on the part of the researcher.

Also, it is acknowledged that some members of the subject pool might have been relatively new to the university and as such might have been new to some of the technologies covered in the study.

IMPORTANCE OF THE STUDY

It is very important that we take a closer look at how students view some of the prevalent technology that may or may not affect their lives at this point. If colleges are to continue to invest large sums of money in automation and electronic communication facilities, it may be worth our while to study the attitudinal responses of the students to this technological imperative. The study of attitudes in light of the literature can in many ways help us better understand the effect contemporary technologies have on students' attitudes in order that we may better prepare for the future.

METHODOLOGY

Selection of Subjects

The Division of Arts and Sciences of the Inter American University of Puerto Rico (henceforth abbreviated DAS) has an enrollment of approximately 2,270 students while the Graduate Education Program of the Graduate Studies Center (henceforth abbreviated GEP) has an enrollment of approximately 540 students. So, for a target population of almost 2,800, most of which are undergraduate, the survey sample size was considered sufficient at the 280 mark (i.e., 10% of the target population). The sample for this study included 226 students in the DAS, predominantly freshmen and sophomores, and 54 graduate students in the GEP.

The fundamental reason for using these two groups as subjects rests on the fact that each group was equally likely to have or not to have come in contact with at least one piece of technology at one point or another.

Instrumentation

When constructing the questionnaire, four primary considerations were made: a) the type or form of question; b) the sequence of questioning; c) the wording of each question; and d) the length of the questionnaire.

The short (5-10 minute) questionnaire was designed to assess the attitudes of the Inter American University of Puerto Rico students towards various contemporary technologies. The first part of the questionnaire identifies the respondents' background with a few demographic questions. The second part of the questionnaire is the largest section and devotes itself to gathering information about the various technologies and how the respondent rates him/herself in their usage, or lack thereof. It is in this section that respondents are given an opportunity to also

express their attitudes towards the various technologies, and also to rate their overall confidence in usage of various technologies in a wide variety of settings. The final section of the questionnaire concentrates on gathering information about the respondents' general feelings and attitudes towards their own quality of life in light of the abundance of technology.

Procedures

Pilot Study

The survey and analysis procedures were tried out with a small group to measure the stability of responses over time. The survey was administered at two different appropriate points in time (i.e., a week apart). This sample was very similar to the population that was used in the primary study. The feedback from the small pilot study was used to revise questions in the questionnaire. Insights on how to better handle certain questions were also acquired through the pilot test. The pilot study determined whether the resulting data could be quantified and analyzed in the manner intended.

Validity

To ensure that the questionnaire was adequately designed to collect sufficient data to answer the questions, a three-member panel of experts reviewed and validated the instrument prior to implementation. The panel was comprised of faculty members with expertise in research and evaluation. A meeting was arranged with each of these individuals to consider the overall design of the questionnaire, following which, the researcher made the necessary modifications. Following each meeting, each of these individuals was asked to answer several questions on the Evaluation Checklist.

Recruitment of Subjects and Administration of Questionnaires

The entire study was conducted on site at the Inter American University of Puerto Rico in San Germán. The researcher approached the instructors of the students from DAS and GEP and asked for permission to administer the questions during a class meeting. Full cooperation of the instructor of each class was obtained. Then the researcher notified the subjects at the beginning of the class about the nature of the study and how long it would take to complete the questionnaire. Confidentiality issues were also discussed before the questionnaire was distributed. Responses were collected and analyzed.

For the purpose of data analysis each item response in the questionnaire was assigned a number, which would help distinguish the various responses. Finally, the raw data (each item response for individual question) was entered into SPSS.v10 (a statistical software package) that reported the frequencies, percentages and cumulative percentages, from which these results are reported.

DATA ANALYSIS

Hypothesis 1

Hypothesis 1 (H_{A1}) involved two interval-measure variables (degree of technology usage and degree of comfort with the usage of the technology). It was directional and predicted a positive correlation between the two variables. Hence, a Pearson correlation was appropriate to measure the linear relationship between the two.

Hypothesis 2

Hypothesis 2 (H_{A2}) proposed that gender makes no difference in computing attitudes towards the usage of contemporary technologies. Thus, the appropriate statistical test for comparing the

difference between the means in the attitudes towards the usage of contemporary technologies of male and female participants was the t-test for independent samples.

Hypothesis 3

Hypothesis 3 ([H_{A3}) proposed that academic affiliation makes no difference in computing attitudes towards the usage of contemporary technologies. The questionnaire that was used in this study specifies 10 academic affiliations. Therefore, A One-Way Analysis of Variance was used to compare the mean attitude towards the usage of contemporary technologies of each of the academic affiliations.

Exploratory Analyses

Various exploratory analyses of the data were conducted in order to glean as much information as possible from them. One type in particular was useful. An analysis of gender differences across all of the different modern technologies was used to detect to what degree males and females differ in their usage, their comfort with, and their attitudes about the different modern technologies. A post-hoc evaluation was performed using Duncan to identify differences in technology usage among the academic affiliations. Another analysis was done comparing age groups (for simplicity, the age groups were recoded in younger students (18-20 years old) and older students (29+ years old) using a median-split). In addition, a regression analysis was performed with the various ratings of comfort level for each technology. Parametric statistics (t-test, ANOVA, and Pearson Correlations) were performed when the dependent variable was measured on an interval scale, and nonparametric statistics (mainly Chi-Square) when the dependent variable was measured on a nominal scale. The final general questionnaire was tested for reliability.

FINDINGS

Results of the Survey

The sample consisted of 130 (46.4%) male participants, 150 (53.6%) female participants, and one participant that did not give his or her sex. A total of 281 surveys were returned, yielding a total response rate of 100%. Of these, the age groups of 18 through 24 exhibited 83.2% of the participants. Only 2.1% were over the age of 40. Of the total of respondents, 224 (80.6%) were undergraduate students and 54 (19.4%) were graduate students. While 236 (84.6%) were full-time students and 43 (15.4%) were part-time students, the majority of them reported to be affiliated with the University in majors associated with Mathematics and Applied Sciences, Biology, Education, and the Social Sciences and Liberal Arts.

A reliability analysis was performed on the scale formed by the six questions on the impact of modern technologies on their lives. The Cronbach's Alpha coefficient was 0.7607; considering that the scale has only six items it indicates good internal consistency.

Hypothesis 1

Hypothesis 1 (H_{A1}) postulated that increased technology usage is positively related to increased comfort with the usage of the technology. The results of a Pearson Correlation analysis between the variables of comfort with the usage of a technology and how often that technology is used yielded significant correlation coefficients for all variables: computer use $r= .390$, $p<0.01$, $n= 273$; email use $r=0.336$, $p<0.01$, $n=242$; Internet use $r=0.356$, $p<0.01$, $n=265$; voice mail use $r=0.422$, $p<0.01$, $n=155$; ATM use, $r=0.395$, $p<0.01$, $n=205$, and cellular phone use, $r=0.365$, $p<0.01$, $n= 240$. Thus, hypothesis 1 was confirmed.

Hypothesis 2

Hypothesis 2 (H_{A2}) proposed that gender makes no difference in computing attitudes towards contemporary technologies. In order to test this hypothesis, a t-test for independent samples was performed for comparing the difference between the means in the attitudes towards the usage of contemporary technologies of male and female participants with each technology. None of the tests were significant at the 0.05 alpha level. Thus, hypothesis 2 was confirmed.

Also, differential use of the technologies was investigated by means of Chi-Square tests on the responses given by males and females to the questions regarding use of each of the technologies. Several variables indicated significant values of Chi-Square. One of these variables was computer use for Web Surfing (Chi-Square= 4.99, df = 1, $p<0.05$. More men use computers for surfing the web while more women than men answered "no".

Also, a difference between men and women was noted in the use of the computer for personal word-processing purposes with women reporting higher use of the computer for this purpose (Chi-Square=13.33, df = 1, $p<0.01$).

In the use of email, male and female participants differentiated in the degree to which they use email for class communication (Chi-Square=6.959, df = 1, $p <0.01$. A bigger proportion of females than males use email for class communication.

In the use of the Internet for pornographic purposes, more men than women reported doing so (Chi-square=16.323, df = 1, $p< 0.01$).

Hypothesis 3

Hypothesis 3 (H_{A3}) posits that academic affiliation makes no difference in computing attitudes towards contemporary technologies. In order to test this hypothesis, a ONE-WAY ANOVA was performed with each department as the categorized independent variable and each of the attitude scores as the dependent variable. Results of the ANOVA failed to detect any significant difference in the data. Thus, hypothesis 3 was confirmed.

Then a ONE-WAY ANOVA was conducted using the different academic affiliation as the categorized independent variable and the responses to "how often the participant used the different technologies" as the dependent variable. The only differences noted were in the use of email and the use of cellular telephones.

In the case of email usage, a significant value of F was observed (F=1.971, df=9,270 $p<0.05$) indicating that there were some differences among the departments.

A post-hoc test was performed using Duncan to identify differences in frequent use of email among the academic affiliations. Duncan was used instead of Scheffé because it is not necessary to be as conservative when exploring results as when confirming a hypothesis. Significant differences were found at the 0.05 alpha level. These are the results:

1. Languages and Literatures department (mean 6.50) indicated a higher email usage than the following departments: Nursing (mean 4.21), Health and Physical Education (mean 3.93), and Biology (mean 4.49).
2. Mathematics and Applied Sciences department (mean 5.28) indicated a higher email usage than the Health and Physical Education department (mean 3.93).
3. Health and Physical Education department indicated a lower email usage than the following departments: Music (mean 5.89) and Education (mean 5.58).

4. Biology department (mean 4.49) indicated a lower email usage than the Education department (mean 5.58).
5. Education department indicated a higher email usage than the following departments: Nursing (mean 4.21), Health and Physical Education (mean 3.93), and Biology (mean 4.49).

In the case of the use of Cellular Telephones, a significant value of F was also observed (F=4.538, df= 9,269, p< 0.01) indicating that there were some differences among the departments in the use of cellular phones.
A post-hoc test was performed using Duncan to identify differences in frequent use of cellular phones among the academic affiliations. Significant differences were found at the 0.05 alpha level. These are the results:

1. Nursing department (mean 6.43) indicated a higher cellular phone usage
2. than the following departments: Languages and Literatures (mean 2.0) and Art (mean 2.86).
3. Social Sciences department (mean 5.35) indicated a higher cellular phone
4. usage than the following departments: Languages and Literatures (mean 2.0), and Art (mean 2.86).
5. Languages and Literatures department (mean 2.0) indicated a lower
6. cellular phone Usage than the following departments: Music (mean 5.44), Education (mean 6.26), Nursing (mean 6.43), Social Sciences (mean 5.35), Math and Applied Sciences (mean 6.27), Health and Physical Education (4.79), and Biology (mean 6.05).
7. Math and Applied Sciences department (mean 6.27) indicated a higher
8. cellular phone usage than the following departments: Social Sciences (mean 5.35), Languages and Literatures (mean 2.0), Health and Physical Education (mean 4.79), and Art (mean 2.86).
9. Health and Physical Education department (mean 4.79) indicated a higher
10. cellular phone usage than the Languages and Literatures department.
11. Art department (mean 2.86) indicated a lower cellular phone usage than
12. the following departments: Nursing (mean 6.43), Social Sciences (mean 5.35), Education (mean 6.26), Math and Applied Sciences (mean 6.27), Music (mean 5.44), and Biology (mean 6.05).
13. Music department (mean 5.44) indicated a higher cellular phone usage
14. than the following departments: Languages and Literatures (mean 2.0), and Art (mean 2.86)
15. Biology department (mean 6.05) indicated a higher cellular phone usage
16. than the following departments: Languages and Literatures (mean 2.0), and Art (mean 2.86).
17. Education department (mean 6.26) indicated a higher cellular phone usage

than the following departments: Social Sciences (mean 5.35), Languages and Literatures (mean 2.0), Health and Physical Education (4.79), and Art (mean 2.86).

Additional Findings

An analysis of sex differences was performed across the variables of amount of technology usage, how participants answered the question of the impact of the technology on their lives, how overwhelmed they were by the technologies, and whether there is a gap between the contemporary technologies and people's ability to keep up with them. The results indicated only one case where a difference between male and female participants was noted. Males reported a higher usage of the Internet (mean 5.69) than women (mean 5.23; t= 2.044, p<0.05, df=277).

Furthermore, age-related differences were explored by performing a series of t-tests on the variables measured on an interval scale (how often used, attitude towards, comfort level with, and impact of the technology) as the dependent variables and two age groups as the categorized independent variable (data was coded so that 18-20 year olds were able to be compared to 29+ year olds). The following significant differences were detected:

1. Attitude towards cellular phones: younger participants indicated a more positive attitude (mean attitude 4.42) than older participants (mean attitude 3.83; t= 3.49, df= 135, $p<0.01$).
2. Comfort-level using Cellular phones: younger participants showed a higher comfort level using Cellular phones (mean 4.25) compared to older participants (mean 3.87; t=2.114, df=135, $p<0.05$).
3. Attitude towards Voice Mail: younger participants had a more positive attitude towards Voice Mail (mean 4.18) than older participants (mean 3.69; t=2.348, df=79, $p<0.05$).
4. How often were ATMs used: younger participants indicated less use of ATM machines (mean 3.67) than older participants (mean 5.04; t=-2.736, df=154, $p<0.01$).

Also, an age-related difference was noted in the answers to the question "Do you feel that there is a widening gap between the contemporary technologies mentioned in this survey and people's ability to keep up with them?", with older participants being more in agreement with the question (mean 3.96) than the younger participants (mean 3.42; t=-2.531, df=153, $p<0.01$).

Findings generally point to a more accepting positive attitude on the part of younger people than older people. Besides, the answer to the question on human ability to keep up tends to suggest that older people feel more threatened by the new technologies.

In addition, an exploratory regression analysis (Stepwise Method) was performed with the various ratings of comfort level for each technology. The predictors investigated were: how often the person uses a particular technology, the person's attitude towards a particular technology, how the person views the overall impact of a particular technology, the person's age, how overwhelmed the person feels by a particular technology, and the person's perceived gap between a particular technology and people's ability to keep up with them.

For each technology, the predictors found were: the person's attitude towards a particular technology, how the person viewed the overall impact of a particular technology, and how often the person used a particular technology. All the adjusted values of R^2 were greater than 0.45 except for the one for personal computers indicating that these three variables had a moderate predictor value on the degree of comfort the person felt with a particular technology. The exploratory regression analysis where overall attitude towards a particular technology was used as the dependent variable did not yield R^2 values greater than 0.25. Therefore, they are not reported.

DISCUSSION OF FINDINGS

Question 1

To what extent does the frequency in the use of a particular technology affect attitude and the likelihood of using that particular technology?
The results indicate that a statistically significant low to moderate, positive correlation exists between frequency of use and the likelihood to use that particular technology. This was expected, as the empirical literature reviewed in this study supports these findings. For example, a study of

178 students who were enrolled in a Public Speaking course revealed that the more experience, the more the likelihood for future use (Scott & Rockwell, 1997). Also the results provide additional support for Six and Tully's (1991) finding that a positive correlation of 0.33 exists between an attitude towards technology and knowledge of technology (including experience with and handling of technology).

It is interesting that the Pearson Correlation analysis yielded significant correlation coefficients for all variables, but these are low to moderate, positive values. This may be because people, especially young students, regard technology as very important for future development and prosperity, and still link it with the idea of progress and growth. But according to Six and Tully (1991), they are also inclined to see the negative aspects of technical development at the same time and to include them in their overall assessment.

In general, the majority of the respondents indicated using cellular phones for private purposes, the ATM to make quick withdrawals, the Internet for email, the email for personal purposes, and the voice mail to receive calls in their absence. It is safe to say that once having frequently used some type of technology, it is likely that there will be continuous use, especially when it comes to contemporary communication technologies like cellular phones, email, voice mail, Internet, and ATMs.

Question 2

Does gender make a difference in computing attitude towards the usage of contemporary technologies?

The results indicate that no significant statistical difference exists between the means in the attitudes towards the usage of contemporary technologies by male and female participants of each technology. Researchers have noticed that the flexible features of contemporary technologies have played roles in shaping the new structures of relations of the users and changing the distribution of information (Sproull & Kiesler, 1986). Users concentrate more on themselves than on other people. In other words, the users become more self-centered or more aware of themselves. One possible explanation is that the prominent social cues are invisible with these new technologies. Another explanation comes from Nilan's (1993) speculation that contemporary technologies bring about multiple voices of a wide range in a new type of communication. For instance, people are using new technology to get beyond one's physical circle of friends and establish new relationships (McCormick & McCormick, 1992).

The additional Chi-Square tests on the responses given by the participants regarding differential use of each of the technologies indicate significant values in some specific cases (computer for web surfing, computer for personal word-processing purposes, email for class communication, and Internet for pornographic purposes). Yet, gender seems to make almost no difference in the use of contemporary technologies and also seems to make no difference in computing attitudes towards contemporary technologies. This slight difference may be attributable to a key feature of contemporary technology. That is, it can be used to suit a variety of values and interests (Groves, 1993).

Question 3

Does academic affiliation make a difference in computing attitudes towards the usage of contemporary technologies?

The findings indicate that no significant statistical difference exists between the participants' academic departmental affiliation and the participants' attitudes towards contemporary technologies. The empirical literature, albeit limited, does offer some support to these results.

While further analysis reveals differences among the academic affiliations concerning participants' frequent use of email and participants' frequent use of cellular phone, yet the results are consistent with Hendley and Parkinson's (1995) finding that attitudes towards technologies appear to be independent of academic affiliation even though a difference seems to exist among the departments and the frequent use of a particular technology.

The post-hoc analysis performed indicates that the students affiliated to the Languages and Literatures department and the students affiliated to the Art department use cellular phones less frequently than the students affiliated to the following departments: Nursing, Social Sciences, Math and Applied Sciences, Music, Biology, and Education. In addition, the students affiliated to the Health and Physical Education department use email less frequently than the students affiliated to the following departments: Languages and Literatures, Mathematics and Applied Sciences, Music, and Education. This may be because people find their use of email and cellular phones towards others less personal compared to face-to-face communication (Daft and Lengel, 1986). Furthermore, the differences in the use of email may be attributable to several key features of the email system. First, many users of email think that it is inadequate as a way to express emotions because of its heavy dependence on text and the computer as an intermediary, where nonverbal communication is almost impossible (Kiesler, Siegel, & McGuire, 1984). As such, people pass on messages in a less personable way that sacrifices the nonverbal nature possible with face-to-face communication. Second, since most email exchanges are not done in real time, people can send a message and spend days waiting for a response, whereas verbal face-to-face communication is completed in real time. Nonetheless, from the results of this study it seems that there is generally a positive growth of email usage among students. This can be attributed to the fact that the Inter American University of Puerto Rico had successfully integrated and absorbed the cost of online Internet by charging all students a flat computing fee. This helps make the cost of Internet usage imperceptible to most students.

The purchase and ownership of cellular phones is likely to increase as prices drop and telecommunication companies make it easier to get one. Besides, the primary reasons to ownership being privacy and emergency use are very likely to remain strong, as for a modest monthly fee the presence of a cell phone may prove to be life-saving and useful for other purposes as well.

CONCLUSIONS

The hypotheses investigated were proven in that: increased usage of technology amounted to increased comfort level with the usage of that technology, gender made no difference in computing attitudes towards the usage of contemporary technologies, and academic affiliation made no difference in computing attitudes towards the usage of contemporary technologies. What follows are some of my concluding thoughts, after having completed all aspects of what I found to be a fascinating and thought-stimulating research study.

Technology has provided many benefits to society. We would not want to go without them. But, at the same time, technology has too often trapped us into a machine-centered mode of life dominated by the needs of technology itself. This was not deliberate. It came about naturally as an unintended side effect of rapid expansion of machines into human activities. But, there is an alternative approach. Today's technology is increasingly centered on information. Because information is essentially invisible and information-processing machines have no moving parts, they have no natural way of showing their operation to us. We are entirely dependent on the skills of the designers to present

us with an intelligible, humane means of interacting with, and understanding the information that systems provide. New information technologies can enhance the power of human thinking. A machine plus a person can do more than either alone, but only if the technology complements human abilities.

We can transform the hard technology of computers and information processing into soft technology suitable for human users, not with the requirements of the technology. With some thought, it is possible to transform the most inhuman of systems into useful complementary interactive technologies.

Technological developments will challenge our future living and working environments, our institutions, and our values, either enhancing or deteriorating the quality of human life. Technology is not just used; it is 'lived.' The quality of life has a great deal to do with the attitudes, values, and abilities with which people need flexibility and the attitudes and the skills of lifelong learning to cope with technological change.

What we will have to recognize and identify, as human beings are the relevant ways in which we can adopt technology in the most meaningful way possible.

Our value responses will determine quality of life criteria, the degree to which the human element is preserved, and the potential to have the appropriate technology to help individuals, families, and institutions provide solutions for economic, social, environmental, and family problems.

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