THE UNIVERSITY OF CALGARY

# COMPUTER TECHNOLOGY AND SOCIAL WELFARE EDUCATION

by

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled, "Computer Technology and Social Welfare Education" submitted by Daniel L. Gannon in partial fulfillment of the requirements for the degree of Master of Social Work.

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## ABSTRACT

This work examines The University of Calgary Faculty of Social Welfare instructor's opinions and attitudes toward computer technology. Four of the independent variables used are Gender, Age, Education and Years of Teaching. The second four independent variables utilized are Have you ever used a computer?, Do you consider yourself to be computer literate?, Do you use a computer in your home? and Do you use a computer for work-related tasks?

Using a Likert scaled "Computer Attitude and Social Issue Questionnaire," all 34 faculty members are surveyed and results examined for correlations between the eight independent variables. Respondents were also requested to write a paragraph giving the meaning and feeling computer technology has for them. These results are divided into computer literate and not computer literate groups, and results compared and contrasted.

The work concludes that although aggregate scores of two test sections entitled Computers and Computers Users and Value and Impact of Computers in Canadian Society showed strong correlations with frequency of computer use, other test sections did not. Furthermore, an examination for correlation between the eight independent variables and individual dependent variables showed no consistent correlations and so the predicting value of the independent variables must be questioned.

The study concludes that frequent computer users continue to view some of the effects of computer technology with concern, and those not utilizing the technology continue to appreciate some benefits of it.

It is suggested the essence of technology and its relationship with human beings will be better understood using phenomenological research because it will be more likely to provide insight into the way we experience technology.

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## DEDICATION

To Mom and Pard for their example in converging technology with humanism.

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# CHAPTER ONE

# INTRODUCTION

## Personal Interest in This Study

The existence of seemingly incompatible attitudes toward computer technology within the social work profession has been of interest to me for some time. That a similarly educated group with shared purpose can harbour such powerful feelings of apprehension and enthusiasm toward the same technology has motivated this investigation.

## Purpose and Objectives of This Study

It appears to me we must understand the different perceptions our profession has formed toward computer technology if we are to understand it and its effect on our client population. We should not, in my view, nurture the illusion we are so exclusive a group that others do not share our conflicts over this latest technological marvel which is imposing itself upon us. Whether we embrace it without question, or reject it without question, the impact of micro-electronic technology will be experienced by Canadian society for years to come and so a middle way of understanding seems to be desireable.

The purpose of this study is to explore attitudes toward micro-electronic technology held by a social welfare faculty and to attempt to draw implications for the profession from the results. The independent variables in this study fall into the two categories of demographics and computer use. These variables are examined for a relationship with dependent variables presented in a questionnaire which solicits attitudes

and opinions held by respondents toward computers. Both Independent and Dependent variables are reviewed in Chapter Two.

## Outline of the Study

There exists great controversy today as to when and if computer technology should be utilized by the social work profession, and this work explores the situation of computers in human services today as it is revealed in published literature. Believing social work faculty instructors are in a position to both reflect and create attitudes within the social work profession, all 34 University of Calgary Faculty of Social Welfare instructors are surveyed by both personal contact and questionnaire, and this data is statistically analyzed and interpreted.

The framework used to organize the literature review in Chapter Two has been proposed by Geiss and Viswanathan (1986), and helps to systematize a complicated network of interactions between values, technology, social work and society. This diagram is included in Appendix A, and consists of seven interdependent and interactive components which are dealt with separately in the literature review. They include values/ethics, science/knowledge, social work education, social work practice, information technology, management and resource development, and actions and applications.

Chapter Three relates the methodology used in the study, and gives details of the population responding as well as the questionnaire utilized with its independent and dependent variables.

Chapter Four relates the results of the survey of Faculty of Social Welfare instructors, and correlations between independent and dependent

variables are reproduced in various tables. Also included in Chapter Four is a qualitative paragraph which respondents wrote to give the meaning and feeling that computer technology has for them.

Last, Chapter Five interprets and discusses the results of the survey, and some conclusions and recommendations for computers in social work are made.

# CHAPTER TWO

# LITERATURE REVIEW

## VALUES AND ETHICS

> The social workers' professional code of ethics is arguably the final standard for assessing the rightness of automating the system. According to this code, the social-service agency and the workers are responsible for promoting the welfare of the clients (beneficence), maintaining the clients' confidentiality (promise-keeping), ensuring that the rights of the clients are protected (autonomy), and preserving the equitable distribution of benefits, burdens, and opportunities to clients (justice) (Geiss & Viswanathan, 1986).

The Canadian Association of Social Workers Code of Ethics (1983) states that social work is founded on humanitarian and egalitarian ideals, and believes in the dignity and worth of every human being. The code further declares social work to be dedicated to the welfare and self-realization of human beings, and to the disciplined use of scientific knowledge regarding human and societal values.

Although this code appears to be specific enough, the rest of society is not bound by it or even aware of it. Many decisions regarding human beings and computer technology are being made by individuals who consider themselves to be moral and ethical, but who are not aware of how complicated these decisions are (Duncan, 1965).

The question of when it is appropriate to utilize computers in human services requires a review of what ethics are, and what ethical decisions are based on. Obtaining agreement as to whether computers should be utilized in human services is difficult because a great deal depends on the circumstances surrounding their use or non-use and

from which philosophical school one views the discussion. The fundamental question of whether they should be utilized, and the criteria by which to decide this question, is seldom addressed in human service literature. Even the present crisis in values being experienced by Western society is believed by some to be actually a spiritual crisis. This group believes values are technological and imply we should look at society and manipulate it so we don't have a crisis in values instead of acknowledging that a spiritual crisis which happens to each individual deep down and must be coped with in an individual way (Nelson, 1979).

Three foundational theories in moral philosophy are natural law, individualism, and utilitarianism (A Question of Ethics, CBC, 1983). Natural law sees certain basic rules of morality as emerging from the nature of things, and recently God's will has been replaced with human rationality (Grant, 1969). What is right can be determined by examining basic human inclinations which indicate what is good for human beings, and principles which direct humans toward these ends are deemed ethical. In this view, one would consider computers good if they assist humans in achieving their basic human inclinations, and bad if they didn't.

Contractarianism and libertarianism emphasize the importance of the individual, and the need to be just and fair. The former suggests the individual act as if he has entered a contract with society, while the latter suggests the individual has basic rights which cannot be taken away from him. Some behaviors are good because if universalized, all individuals in society would benefit, and that is the kind of behavior a society of rational beings could accept. Believing in free will, the

individual has strong rights against the collective because human beings are an end in themselves, not a means to another end. It might be said this view would not allow machines to take away human work because humans require employment for dignity, if not livelihood, and the needs of the individual human must come first even if collective society must make some sacrifice.

Finally, utilitarianism judges acts on the quantitative units of the happiness they create, with the moral act being that which maximizes units of happiness (A Question of Ethics, C.B.C., 1983). This outlook lends itself to unequal distribution of units of happiness because the units are not averaged among group members. For example, a situation where Group A received fifty-five units of happiness and Group B received three units would be preferred over Group A and Group B receiving twenty units each, because the total units of happiness for society are greater in the former situation. Obviously, this system of distribution is not based on egalitarianism and so would be difficult to reconcile with the Social Work Code of Ethics, but may fit well into the reality of one whose primary goal is to minimize costs and maximize profits.

Ethical principles for professionals using computers in human services have been put forward but it should be noted that standards adopted by one professional body are not binding on other professionals as long as they are not using the same name as the profession which adopted the standards. The availability of mail-order self-help programs, and other human service software, increases the accessibility of tests being used by untrained professionals, and consequently danger for their misuse increases (Fowler, 1985).

The American Psychological Association has proposed government work with them to set standards for screening potential computerized test users, recognizing that without rigorous evaluation, a computerized self-help program is merely a high-tech snake oil, perhaps contributing to a user's problems by delaying effective treatment of it (Erdman, Klein & Greist, 1985). If computer technology is effective in dealing with human services, it may be construed as unethical not to use them for treatment that is willfully excessive or inadequate constitutes unethical practice (Council on Ethical and Judicial Affairs, 1986).

Although similar potential dangers exist for unethical use of computerized systems of institutional recording as for paper systems (Wolkon & Lyon, 1986), fear and potential of interfacing mental health, criminal justice or welfare organizations information without a person's knowledge or consent is greater with computerized systems (Wolken & Lyon, 1986)

Fourteen ethical principles put forward for utilizing computers in counselling situations include destroying information about a client when it is no longer of assistance in providing services to a client, and assuring all identifying information is removed from records when they are accessible through a computer network. Research participation release forms must be completed by anyone who has automatically collected identifiable data from a human service computer, and any tests used must be appropriate for clients needs, accurately reflecting the intentions of the test author. Finally, it must be ascertained the client feels comfortable using the computer program, and follow-up sessions must be available to explain and interpret the experience for the client (Sampson & Pyle, 1983).

But with regard to technology in general and computers in particular, explicit value assessment is usually absent. Our emphasis on "gee-whiz" and "can-do" reflects our fundamental desires for playfulness and productivity, and our readiness to allow these goals to override the question regarding the morality of technology and its applications (Christiensen, 1986).

With this quagmire of morality of technology and its applications, we will leave the discussion on Values and Ethics and how they guide us in our dealings with computer technology. Departing with a question seems particularly appropriate when one contemplates the enormity of the task for society, matched in magnitude only by its urgency.

## SCIENCE, KNOWLEDGE AND TECHNOLOGY

### Scientific Knowledge

Utilizing Aristotelian logic which declared it to be impossible for the same thing, at the same time, to both belong and not to belong to the same thing in the same respect (Fromm, 1960), Decartes with logic and Bacon with method of experiment (Bronowski) ushered in the modern age by separating subject from object (Grant, 1986). Newton joined the rational and the empirical, and the world of science became a machine with definite properties which can be isolated, and reproduced in space and in time, and which can be predicted (Bronowski).

But the clockwork universe of Newton came to an end, as McLuhan explains:

> The Newtonian God--the God who made a clock-like universe, wound it, and withdrew--died a long time ago. This is what Nietzsche meant and this is the God who is being observed.

> Anyone who is looking around for a simulated icon of the deity in Newtonian quise might well be disappointed. The phrase "God is dead" applies aptly, correctly, validly to the Newtonian universe which is dead. The ground rule of that universe, upon which so much of our Western world is built, has dissolved (McLuhan and Fiore, 1967).

This view of the world machine was eliminated for physicists when Einstein showed there is no universal now, rather there is only here and now for each observer. Max Planck discovered that energy like matter was not continuous in 1900, and the classical mechanistic view of the world took another modification. In 1927 the German physicist Heisenberg put forth the principle of uncertainty which stated the observer always affects or modifies in some way that which he is observing (Bronowski) and Godel's incompleteness theorum showed that every system has some statements whose truth or falsity cannot be decided by the formal means of the system itself (Weizenbaum, 1976).

In spite of these discoveries of mathematicians and physicists of what Bertrand Russell termed suspended judgement (Kroker, 1985) cause and effect have taken a powerful hold on our minds. In human behavior professions the word cause has been translated as motive or compulsion, and effect has been translated as behavior (Bronowski). Modern society exhibits what Whitehead termed the fallacy of misplaced concreteness (Weizenbaum, 1976) and every sphere of human activity is analyzed systematically. Utilizing the technical operation which consists of four main stages, our world is examined (Vanderburg and Higgs, 1986).

First, an area of human life is studied for a particular purpose and second, the results of this study are used to build a model of the original study. Third, designated parameters of the model are altered and the effects recorded. Finally, the area of life studied originally is

altered in a similar manner to the altered model which produced the most desired result (Vanderburg and Higgs, 1986).

This phenomena has been addressed by educator, John Dewey, as follows:

> . . . compartmentalization of occupations and interest bring about a separation of that mode of activity commonly called "practice" from insight, of imagination from executive "doing." Each of these activities is then assigned its own place in which it must abide. Those who write the anatomy of experience then suppose that these divisions inhere in the very constitution of human nature (McLuhan and Fiore, 1967).

## Technique and Techology

Recent studies among fifteen to twenty-four year olds reveal 76 percent to believe technology will destroy the environment and we will face an eco-catastrophy (Schiller, 1983). To understand technology today, it may prove helpful to look at where we have come from with it. Etymologically, technology is a combination of the Greek terms Techne' and logos, which signify a virtue which allows one to attain truth. The modern term originated in English and in French in the 1600s, and implies an articulate thinking through of the essence of making or doing (Burch, 1984). Technique is a recipe which can be taught, and, if followed, should lead to the end desired, repeatedly (Barrett, 1979).

But our modern computer technology has an effect upon us which we may not be aware of, as Turkle points out:

> Technology catalyzes changes not only in what we do but in how we think. It changes people's awareness of themselves, of one another, of their relationship with the world. The new machine that stands behind the flashing digital signal, unlike the clock, the telescope, or the train, is a machine that

> "thinks." It challenges our notions not only of time and distance, but of mind (Turkle, 1984).

Technological society in the last one hundred years has demanded human problems be dealt with in the same efficient method as we control non-human nature, and so the value-free social sciences were developed (Grant, 1969). Wonderfully suited to the task of controlling human behavior, the quantification-orientated behavioral sciences attempt to distinguish between judgements of values and judgements about facts in an effort to persuade professionals they are being objective in their decision making (Grant, 1969). The all powerful scientific method cannot be used in deciding what is good or bad for us because these are purely subjective views, and as only decisions arrived at by the scientific method are relevant, good and bad are relegated to the insignificant realm of individual emotional make-up and personal preference. This pluralism is no match for the monistic fact of technology so it rolls on, unchallenged (Grant, 1969).

To be effectively analyzed, technological impact must be assessed within a horizon greater than itself, and this is nearly impossible for us, the products of a technological society. Within our modern ways of thoughts and beliefs, we are technique itself (Grant, 1969). The new natural science and the new moral science have developed together in mutual interdependence, and so the fundamental assumptions of each were formulated in light of the other.

The scientist strived to, as Karl Pearson wrote in 1892, eliminate himself from his judgements (Weizenbaum, 1976). This view was summed up in the 1950s by sociologist, Robert Bierstadt as follows:

> . . . the scientist, as such, has no ethical, religious, political, literary, philosophical, moral, or

> marital preferences. . . . As a scientist he is interested not in what is right or wrong or good or evil, but only in what is true or false (Montegue & Matson, 1974).

It should be readily apparent this attitude is in direct conflict with the Social Work Code of Ethics, which purports to place a definite value on the purpose of man. Some examples of how other groups have utilized the technological approach to manipulate human beings suggests not every group is as concerned with the dignity of man as social work claims to be.

Consider, for example, John B. Watson, generally considered to the founding father of the science of human conditioning in North America. Christening it Behaviorism, Watson adapted the 1912 experiments of Russian Ivan P. Pavlov to human behaviors, in spite of Pavlov's reluctance to do so (Montegue & Matson, 1974). Mother Russia, too, like Watson, was quick to apply the approach to human conditioning in the Stalin era, calling it reflexology and presently concentrating it in the Gulag Archipelago (Montegue & Matson, 1974).

Although perporting to be objective, Watson made his practical intentions clear with a comparison:

> The interest of the behaviorist is more than that of a spectator; he wants to control man's reactions as physical scientists want to control and manipulate other natural phenomena (Montegue & Matson, 1974).

And again,

> The behaviorist would like to develop his world of people from birth on, so that their speech and their bodily behavior could equally well be exhibited freely everywhere without running afoul of group standards (Montegue & Watson, 1974).

Far from being objective, these purposes are laden with values, and they are values with which social work does not seem to be in

agreement. Similarly, social engineering developed concurrent with behaviorism and the efficient social movement labeled Technocracy began in the 1920s (Montegue & Watson, 1974).

Upon reflection, the value-fact distinction is not as clear as some would have us believe. To base a decision or experiment on only what is known or can be objectively quantified by us is to, by definition, exclude all that we know but cannot prove by the scientific method. To be able to imagine something or realize it through contemplation is not acceptable, even with the realization someone else may, at another time, be able to prove even these postulations using the scientific method. In western society, technique defines what is real and credible, and so other systems of meaning which might be used to establish our happiness and purpose are excluded because they are not conducive to investigation and gauging using the scientific method (Grant, 1969). An invisible social filter is set up, and experiences which do not fit into this paradigm of reality are excluded by the western mind (Fromm, 1960).

Permeating deep into our individual and collective lives, this technical approach to reality measures efficiency, productivity and cost-effectiveness without explaining how well the new development will fit into the environment. Technological advances are embraced readily by us because the benefits are obvious, but the long term costs are often hidden. Constantly making something internally more efficient may cause problems out of the context in which the thing exists, but the technical imperative causes us to deal with these problems by giving them more of the same. This is in contradiction to the opinion that one should not design around the problems of human environment as much as one should

attempt to eliminate them (A Tale of Giants: Reactors, Computers and Megaprojects, C.B.C., 1984).

Concern with technology and its effect on societies in which we live has been expressed by technological historians over time. Canada, in particular, has made a noticeable contribution to this literature, perhaps because of the country's midway point between the future of the new world and the past of other cultures (Kroker, 1984).

One of the better known writers on this topic is Jacques Ellul, who has a deterministic view of technology (Ellul, 1964). He does not believe technology is morally neutral, rather that it is impossible to control. Technology reorganizes man's environment, shifts his institutions and behavior patterns, and almost necessarily dehumanizes him in some way (Kroker, 1984).

Ellul is so concerned with technique he has proposed five conditions which must be brought about before society can effectively deal with it. First, we must diagnose the problem of technology, recognizing that it is far more than the sum of its parts. Second, we must stop dealing with technology as if it were sacred, and third, we must teach detachment and independence from it, being free to use or not use it. Fourth, we must develop an authentic philosophy of real meaning which will bring a possibility of mediation between man and machine. Lastly, Ellul suggests a dialogue between those who are aware of the problems and the technicians who are not (Ellul, 1964).

Each culture elevates what is most essential and valuable to its way of life to a sacred plateau. With the western experiment (Grant, 1969) technique and technology enter the realm of the religious in our society

and so critical or objective treatment of it comes to be next to impossible.

On a more positive note, Richard Buckminster Fuller felt tools were an extension of man and industry an extension of society. For Fuller, technology is something to be proud of and he exhalts its virtues without hesitation.

> What is really unique about man is the magnitude to which he has detached, deployed, amplified, and made more incisive all of his many organic functionings. Man is unique among all the living phenomena as the most adaptable omni-environment penetrating, exploring, and operating organism being initially equipped to invent intellectually and self-disciplined, dexterously, to make the tools with which thus to extend himself. The bird, the fish, the tree are all specialized, and their special capability-functioning tools are attached integrally with their bodies, making them incapable of penetrating hostile environments. Man externalizes, separates out, and increases each of his specialized function capabilities by inventing tools as soon as he discovers the need through oft-repeated experiences with unfriendly environmental challenges. Thus, man only temporarily employs his integral equipment as a specialist, and soon shifts that function to detached tools. Man cannot compete physically as a muscle and brained automaton--as a machine--against the automated power tools which he can invent while metaphysically mastering the energy income from universe with which evermore powerfully to actuate these evermore precise mass-production tools. What man has done is to decentralize his functions into a world-around-energy-networked complex of tools which altogether constitute what we refer to as world industrialization (Fuller, 1969).

Acknowledging social crisis will be brought about by the optimal conditions when machines take over human labour, Fuller suggests the redundant human beings be given a life fellowship in research and development, or in just thinking (Fuller, 1969). He further speculates computers could unify the world by their impersonal problem solutions (Kroker, 1984).

Technology does not wait for society, rather it tends to create it, as a brief look at history reveals. The 11th century found the adoption of fireplace and chimney disrupting everyday life and order because previously, heating was provided by open fire with smoke filtering out through shingles or thatched roof. The entire household lived, ate, and slept in a great hall, but the fireplace and chimney allowed for individual rooms to be built on different floors throughout the house, and the former egalitarianism disappeared (Rybczynski, 1983). In 1346, the pagentry and excitement of middle age chivalry began its demise with the introduction of the English longbow into warfare. Ordinary yeomen of England were able to eliminate the French knights as fast as they lined up using the new weaponry, and an entire way of life came to an end (Kline, 1986). Still, in England, in 1559 Queen Elizabeth I refused to grant a royal patent for a knitting machine on the grounds that it would deprive too many of her subjects of employment. Similarly, Charles II gave a charter to hosiers' guild which protected them against mechanization until the 19th century (Rybczynski, 1983).

Not always has resistance to technology had the governments approval, however. The word sabotage was coined when in the 19th century Belgian weavers would accidently drop their wooden clogs (sabots) into the delicate mechanism of the weaving loom, causing the factory owner to reconsider (but not reject) utilization of the machines. English knitters, in 1811 to 1816, smashed more than three hundred knitting frames because they felt not enough profit was being shared by owners of the factories. Threshing machines were the focus of attention in 1830, when over four hundred threshing machines and some factories which manufactured them were destroyed because they took away work

from workers in the season they needed it the most - winter (Rybczynski, 1983).

Recognizing that scientific theory needs to be interpreted in the light of man's constant search for meaning, both in his own life-experience, and in an evolutionary process in which he has so recently discovered himself to be participating (Towers, 1971), we must look for more than the mechanical in human behavior.

> A good many ordinary scientists, together with most lay commentators, dazzled by the marvels of our technological age, still think of the world and everything in it in terms of "machines." Such a concept has long since ceased to attract the minds of more penetrating thinkers. Simple, mechanical cause-effect analysis is essential in any enquiry about the natural world. But anyone today who stops short at that seventeenth-century level of thinking shows himself to be in a state of arrested development (Towers, 1971).

Closely related to this anti-mechanistic approach to human thinking, and closer to the concerns of social work, is the view that the emotions must be dealt with in a different manner than the rational and cognitive. Although they govern our behavior, emotions were formulated during childhood and are not based on the rational and the cognitive.

> The child not only is father to the man but is carried within him as a lifelong pilot whose hand at the controls it is dangerous to neglect. But the adult, rational, cognitive mind has long since lost the characteristics that would have suited it to the operating patterns of the childlike core. The window in the developmental sequence through which the core structure were programmed has opened and closed by the time the individual reaches maturity, leaving in charge a set of global high-level principles which nobody understands at any stage of their development. When the child is a child, the parent does not understand him or her from the perspective of an outsider, and when the child grows up to become an adult, the new and highly specialized patterns of adult conscious reasoning do not easily penetrate the basic rules of the emotional system;

> that were laid down when the cognition was so much younger and so different. Note that this region is not inaccessible as the result of repressions, and is quite different from the unconscious as conceived of by Freud (Harre', Clarke, and DeCarlo, 1985).

Learning style enhances both the tempermental and the cognitive (Child, 1986), and it must be asked whether the technical approach will be effective in adjusting to the various learning styles of individuals.

> Affective style involves those characteristic tempermental and motivational traits which influence an individual in the process of problem-solving. It is widely accepted that, for example, such tempermental traits as anxiety, submissiveness, self-assurance, introversion, enthusiasm, or dynamic traits of self-concept, need for achievement, curiosity, fear, are instrumental in affecting performance (Child, 1986).

Intellect and logic not being adequate to deal with emotions has been further elaborated upon by Fromm.

> But soon Freud and other analysts had to discover the truth of Spinoza's statement that intellectual knowledge is conducive to change only inasmuch as it is also affective knowledge. It became apparent that intellectual knowledge as such does not produce any change, except perhaps in the sense that by intellectual knowledge of his unconscious strivings a person may be better able to control them--which, however, is the aim of traditional ethics, rather than that of psychoanalysis. As long as the patient remains in the attitude of the detached scientific observer, taking himself as the object of his investigation, he is not in touch with his unconscious, except by thinking about it; he does not experience the wider, deeper reality within himself. Discovering one's unconscious is, precisely, not an intellectual act, but an affective experience, which can hardly be put into words, if at all (Fromm, De Martino and Suzuki, 1960).

## Another Way of Knowing

Eastern thought with its humane philosophical foundations has been described as polar-complete, and western thought with its religious

foundations as absolute-fragmental (Holbrooke, 1981). The twenty-five hundred years of eastern scientific though have grown to encompass the entire world, while the west believes what is true can be and must be isolated from the human experience and tested empirically: seen, heard, smelled, tasted or felt. To be real, the phenomenon must be experienced by more than one person in a similar manner, or verified by more than one person. Not allowing for opposites to exist simultaneously disallows paradoxical logic, and westerners are taught to ignore or leave out realities which do not fit our rationality, leading us to absolute-fragmentism (Holbrooke, 1981). This problem, as recognized by the east, is summarized by Hsia Po-Yan:

> I think I have seen the Western mistake. You are very able to distinguish things, but you are unable to place things together. Your scientific conceptions therefore all have holes in them, and numerous incomplete principles are set forth. If you continue in this way, you will never be able to repair this.
>
> The technological society does not acknowledge that rational knowledge is irrational only because it is not obtainable through reason. Other knowledge obtainable through means other than reason are not irrational; extra-rational. The gift of the gods is to recognize which is which--ideas that are susceptible to rational analysis and ideas that are not (Siu, 1957).

Advances have been considerable in analyzing or checking out rational knowledge but intuitive knowledge has not enjoyed the same attention and this has caused logicians to depreciate the fuzziness of intuition. Westerners are taught not to trust intuition and to ignore the fact that it is necessary for total understanding or insight.

> An important difference exists between "having-no" knowledge and having "no-knowledge." The former is merely a state of ignorance; the latter is one of ultimate enlightenment and universal sensibilities.

> To the confirmed rationalist, no-knowledge may appear to be the hugger-muggery of the mystagogue. Nevertheless, it is precisely its ineffability that lends force to its reality. The mysteries of nature appear to be mysteries only to those who refuse to participate in them (Siu, 1957).

Zen Buddist D.T. Suzuki interprets how the technologically orientated person might view the eastern adherent:

> In many ways the East no doubt appears dumb and stupid, as Eastern people are not so discriminative and demonstrative and do not show so many visible, tangible marks of intelligence. They are chaotic and apparently indifferent. But they know that without this chaotic character of intelligence, their native intelligence itself may not be of much use in living together in the human way (Fromm, De Martino and Suzuki, 1960).

Although we have thus far dealt with Eastern philosophical outlooks, our own North American natives also have a contribution to make in this area. Both Lame Deer and Walking Buffalo suggest white people pay too much attention to the symbols of reality and not enough to the spiritual (Lame Deer & Erdoes, 1972; MacEwan, 1969).

This brief critique of western technological society through cultures much older than it suggests there may be approaches to reality as valid as our own, and that is why they have been included here. It is also an attempt to provide an alternative reality for those social workers who continue to resist further technological mediating of human relationships. Perhaps they are expressing a suspicion that technology is leading us away from the true meaning of life, and that addressing human problems with more technology is merely dealing with a symptom, not the cause of the pain.

An attempt to deal with this dilemma has been made by Allan Watts, psychologist and adherent to eastern philosophy.

> . . . certain social institutions are self-contradictory or in actual contradiction with the form of nature. But . . . these institutions have the strongest emotions invested in them. They are the rules of communication whereby people understand one another, and they have been beaten into the behaviour patterns of impressionable children with the full force of social anxiety. At the same time, those who are taken in by such institutions are suffering from them--suffering from the very ideas which they believe to be vital to sanity and survival. There is therefore no way of disabusing the sufferer directly, by telling him that his cherished disease is a disease. If he is to be helped at all, he must be tricked into insight. If I am to help someone else to see that a false problem is false, I must pretend that I am taking his problem seriously. What I am actually taking seriously is his suffering, but he must be led to believe that it is what he considers as his problem (Watts, 1961).

Perhaps Watts is referring to the real unknown as always being an emotional unknown (Needleman, 1975), and perhaps this unknown cannot be reached with a technological approach. But we should not grasp realities from other cultures too quickly, believing them to be a panacea for all our ills. As Avens explains:

> Once again it is as in the old Chinese saying, "If the wrong man uses the right means, the right means works in the wrong way." In effect, it is the Western belief in the right method irrespective of the man who applies it that seems to be responsible for the impasse, because method alone, divorced from the psyche, only breeds the delusion of technical omnipotence (Avens, 1980).

In this state of disequilibrium, we will progress to the next three topics of Social Work Education and Social Work Practice, leading to Information Technology and its continuing destabilization effect on both (Geiss & Viswanathan, 1986).

## SOCIAL WORK EDUCATION

> People often fear that using computer models for people will lead to mechanical or linear thinking: They worry about people losing respect for their intuitions, sense of values, powers of judgement. They worry about instrumental reason becoming a model for good thinking. I take these fears seriously but do not see them as fears about computers themselves but rather, as fears about how culture will assimilate the computer presence. The advice "think like a computer" could be taken to mean always think about everything like a computer. This would be restrictive and narrowing. But the advice could be taken in a much different sense, not precluding anything, but making a powerful addition to a person's stock of mental tools. Nothing is given up in return. To suggest that one must give up an old method in order to adopt a new one implies a theory of human psychology that strikes me as naive and unsupported (Papert, 1980).

Computer-assisted instruction is the use of a computer to instruct an individual or group, and is generally considered a powerful learning tool. The four kinds of computer-assisted instruction are drills, tutorials, simulations, and games; and the student can generally advance at a comfortable pace with a patient teacher (Harper & Mandell, 1987).

But women may require special encouragement to appreciate computers, as from kindergarten through graduate school in the United States they are under-represented in computer studies. Stanford University researchers found three times as many boys as girls attending computer camps across the United States (Kolata, 1984). It has been postulated by Rubin (1983) that men trust machines more because they have been socialized to be thing orientated while women are people orientated (Tinnel, 1985).

Although a number of schools of social work in Canada and the United States teach students to use computers, and use computers in

teaching university courses, most do not, and this is in spite of the following view expressed by Di Leonardi:

> Assistance to social work education with the integration of information technology into practice should come in the development and dissemination of model curricula that help students recognize and resolve the conflicts that come with the adaptation and adoption of technology into a humanistic and non-technological fields (Di Leonardi, 1986).

This is in spite of the acknowledged importance of the problem-domain expert being involved in applying technology to his profession.

> A final outcome of this effort was the realization that mission oriented computer users in a particular problem area are in the best position to systematically add to our knowledge and capability in the application of computers in the problem domains. This seeming tautology has major implications for the thrust of future work--effective leadership in the formulation and solution of social problems is the proper responsibility of those closest to the problem, not the computer expert (Geiss & Viswanathan, 1986).

If forced to utilize instructors who are not educated in social work the practical focus of social work may be missed and students will not have role models for identification (Schiller,1983). The essence of teaching is not in the facts and data which it conveys, but in the interpretations that are transmitted in either implicit or implied ways (Koestler, 1972).

Literature suggests that social work educators are among those most resistant to computer technology (Nurius & Mutschler, 1984; Schoech, 1983, 1984, Smith, 1983) in spite of pressures on human service organizations to become more effective and accountable (Nurius & Mutschler, 1984). It has been suggested (Greist, 1984; Glueck, 1984) that the present generation of social service practitioners has embraced one set of paradigms (Kuhn, 1970) and that many are unprepared for

the ordeal of change that computers represent for them. Some believe the Schools of Social Work themselves are not able to adapt to the change, as is expressed by Flynn:

> The basic purpose is to use computer technology in a way that maximizes the "hardwired" capabilities of the human mind in indeterminate problem-solving environments. Computer programs built with this objective in mind combine many case histories in which different organizing principles or outcomes can be observed. The human mind puts a "face," or pattern on these cases after being introduced to a wide range of episodes. The "correct" principle is discovered by the user, not incorporated into the software design (Flynn, 1986).

The above approach to teaching is believed to be effective with even the seasoned social work practitioner as it provides a means for forming new perceptions, and, as such, will challenge the view that experience is the best teacher.

When computers are used in social work at the present time, it is most frequently for research and for data processing (Hansen, 1981; Nurius & Mutschler, 1984; Smith, 1983), and it has been estimated in the past this is what they are used for 95 percent of the time. Recently, however, computers are beginning to be utilized in teaching social policy and administration courses as well (Flynn, 1981). There has also been an attempt at having undergraduate social work students improve their field journal writing (Leben, 1985), but social work is not keeping up to other professions in utilization of computer technology.

Within the university it is said to be becoming more difficult for university researchers to consider technology with its benefits and disadvantages and so the public institution may be directed to develop technology that is not in the public interest. Although in 1982 industries in Canada contributed less than 5 percent of the university's total

research budget, academic-industrial connections are being encouraged by governments at both federal and provincial levels. Some are concerned that as this trend increases the money received by universities will increasingly go for industry-directed projects or research. The trend could take from the universities their autonomy in deciding what kinds of research priorities should be pursued (The Academic-Industrial Complex, C.B.C., 1982). Should this happen the onus will be placed on the professions to have strong input into the training upcoming members receive, particularly in the field of professional ethics.

LaTrobe University in Australia has designed a course which aims to demystify and increase understanding of computerization by social work students, believing a critical appraisal by students themselves is best in the course of their practical experience with computers throughout the school term (Smith, 1984). This approach appears to equip human service professionals for informed and ethical dealings with computer technology, recognizing this as an essential part of a quality education (Brewer, 1983).

For faculty to do this, of course, they themselves must be aware of possibilities and limitations of applying computer technology to their field of expertise. Brewer has summarized this view as follows:

> The faculty may not want to become trained programmers but they will be able to employ effectively the services of professional programmers. By gaining a better understanding of the uses of computers in their disciplines, faculty can change their perceptions of the machine from a demigod to an efficient tool in teaching and research (Brewer, 1983).

At The University of Calgary, the Telematics Committee of the General Faculties Council surveyed computer use in course instruction in

January of 1986. Of the twelve instructors from the Faculty of Social Welfare who responded, 50 percent stated they were employing computers in courses they worked on at present, and the remining 50 percent stated they expected to use computers within the next two years. The 50 percent affirmative response was higher than faculties of Physical Education, Medicine, Nursing, Environmental Design, Science, Humanities, Social Science, Fine Arts and General Studies. The Faculties of Continuing Education and Graduate Studies equalled the Social Welfare affirmative response of 50 percent, while the faculties of Education, Management, Engineering and Law surpassed the social welfare faculty in affirmative responses.

Although limited in value because of the low population sample, this survey suggests a large number of Faculty of Social Welfare instructors are either presently using or prepared to use computers by January 1988.

To train faculty instructors who are not presently computer literate but who wish to be, the Rochester Institute of Technology introduced summer workshops for faculty to attend on a volunteer basis. The workshops contained four major components beginning with the Pascal programming language and computer graphics and progressing to an introduction of computer systems. In spite of fear and misgivings by participants who had never touched a computer before, participants evaluated the workshop as worthwhile and enjoyable (Young, 1985). This approach to training faculty met the four criteria of computer education: training for the right goals, trainees being allotted adequate time, training conducted in the appropriate way, and training was continuous (O'Conner, 1986).

Computer-assisted instruction allows for individualized instruction giving the student greater independence and opportunity to work at his own pace. Branching capability in a program allows individualized response to student errors with remedial prompting toward the correct response. This encourages the student to contribute to discovering and exploring his mistake (Kettler, 1985). If the program allows for content alterations and authoring, the instructor can modify it to suit a particular student's learning requirements; or change the emphasis for different course goals. It has been suggested active participation time by students is increased with computer-assisted instruction since students must respond to each activity before the next one can be accessed. Experience has shown a high increase in peer communication and interaction while working on computer lessons (Garvey, 1985).

Computer-aided learning in social work is poorly developed, but human service personnel can benefit from professionals in other disciplines who often have an established history with computer-aided learning and its techniques (Homer, 1985). These are surveyed in the upcoming discussion on Actions and Applications. But closer to social work education is social work practice, and it is to that we now turn our attention.

## SOCIAL WORK PRACTICE

> The social work profession still embodies the old spirit of humane service that illuminated the arts of healing and caring. Perhaps newer advances in science and technology may be harnessed to this spirit to develop and maintain the human edge (Geiss & Viswanathan, 1986).

Before delving further into the topic of computers and social work, it may be helpful to establish why this topic is a concern for social work. An understanding of what social work is would seem to be an appropriate place to begin, and we now turn our attention to that topic as it has been summarized by Minahan:

> The purpose and objectives of social work have been discussed since the beginning of social work. Published highlights of these discussions include the proceedings of the 1929 Milford Conference, the Hollis-Taylor report of the Council on Social Work Education in 1951, the NASW "Working Definition of Social Work Practice" in 1958, Gordon's "Critique of the Working Definition" in 1962, and the special issue of Social Work on conceptual frameworks in September 1977.
>
> Over the years there has been a growing belief that social work purpose should focus on the interaction of person and environment. However, there have been sharp differences of opinion on the emphasis to be given to person, the emphasis to be given to environment, and how interventions should be directed toward the inactions between them. Further, social workers have had different opinions on several issues connected to social work purpose and objectives, including issues relating to residual or institutional approaches to practice - whether social work is for everyone or only for special problem population; the appropriateness of social workers' serving as agents of social control; the nature of the relationship of social workers to their employing organization; and the knowledge and skill required for generalist and specialist practice (Minahan, 1981).

A written statement was eventually issued which defined the purpose of social work as to promote or restore a mutually beneficial interaction between individuals and society, and clarified the objectives as focusing on person and environment in interaction (Social Work, 1981).

Practice ideologies perform for the human service organization a dual function of reducing uncertainty, offering a consistent course of

action, and they provide the rationale and justification for staff actions with clients (Hasenfeld, 1983). Practice ideologies must be in agreement with organizational goals or innovations are liable to be not accepted by organization personnel (Rimer, 1983). It is imperative, therefore, that the practitioner come to terms with the technology utilized by the organization within which his practice will take place.

Social work is to enhance the problem-solving capacities of people, linking them with appropriate systems. The profession is to promote effective and humane operations of these systems, contributing to the development of social policy (Pincus & Minahan, 1973). Acting as a third force between people and their systems (Schulman, 1979), the social worker assists in the process of deciding what to do, and doing the decided (Compton & Galaway, 1979). Arguing that social work has trapped itself in a dysfunctional paradigm of the traditional sociology of professions, it has been suggested social work should be defined by its social assignment of dealing with dependency in populations rather than by a specific body of knowledge that it may possess (Popple, 1985).

Dealing with dependency was, before the industrial revolution, delegated to family, church, and community. As these institutions proved ineffective in dealing with dependency created by industrial society, a new human behavior technology was created to deal with social problems which were threatening society (Popple, 1985). This social mechanism was called social work.

If we allow this definition of social work to replace the more commonly accepted one based on cognitive exclusivity, we quickly realize information technology is very much a concern for social work. Society

has come to depend on computer technology, and disenfranchised groups are falling behind, as has been pointed out:

> There is evidence (Anderson, 1983; Anderson, Welch & Harris, 1983) of inequity in the distribution of computers in elementary-level classrooms. Where the poorer districts are on a par with wealthy districts with regard to equipment, there is inequity in how the equipment is used, that is, the wealthy districts develop mastery of the technology, and the poor districts use it to reinforce long-division processes through drill-and-rote programs. There is evident sexual bias: males predominate in the use and study of computers. (See Lockheed, Nielsen & Stone, 1983, and Zimmerman, 1983.) The poor are less likely to be able to afford the equipment and use charges associated with networking and information-system access. In fact, they are less likely to be able to use the technology effectively if they are given access (Childers, 1975). Who will speak for these groups (Geiss & Viswanathan, 1986)?

One must question the likelihood of social work or any other group being competent enough to deal with these inequities if they know nothing about the technology. There is also the self-help software which may cause casualties; and social work may have a role in dealing with these, as well as a responsibility to inform government and the public about how to deal with them (Geiss & Viswanathan, 1986).

Lest we fall into our western technological paradigms exclusively, however, it may be beneficial to include another view of social work which does not include technology. It is necessary to keep other options in mind when dealing with computer technology or it may, as has been suggested, enchant us into believing it is the only approach to human problem solving.

Juxtapositioning the western technocratic approach to human behavior is the ancient therapeutic system of shaminism, an approach to easing pain which crosses many cultures on every continent and in Oceania

(Canda, 1983). Social work and shaminism are similar in that they are both committed to dealing with person-and-environment in interaction, and Canda continues the discussion:

> Social work deserves praise for its attempts to deal with the person/environment whole, at least as an ideal. Yet it lacks the insight of shamanism that all beings, human as well as nonhuman, are personal, powerful, and deserving of respect. Adequate treatment of damaged connections requires dealing with all relevant beings to reaffirm their connections in a personal, balanced, and sacred manner. This is a truly trans-cultural approach, transcending the bias that only beings with human physiognomy and culture are persons. The psychiatrist, R.D. Laing, defines a person as an experiencing being; it is both its own subject and others' object in interpersonal interactions. A person's experience and action occur in a social field of reciprocal influence (Canda, 1983).

But shamanistic practices rapidly disappear under the impact of industrialization as the various functions of the shaman are replaced by professionals versed in western approaches to problem solving. This move to the western specialist is not necessarily for the betterment of society, as Brandon points out:

> Both Bernard Shaw and Philip Slater argued that all professions are conspiracies against both the general public and their consumers. Those who seek to provide services are often prevented by established members of the professions--such as doctors, teachers, and social workers--since the principle behind any professional organization is (a) to restrict membership (b) to provide minimum service at maximum cost (Brandon, 1976).

The above two quotations appear to have little to do with computer technology but as was pointed out, technology is part of us in western society and we need assistance from outside our western societal value base to evaluate it. Having taken the pre-caution of reminding

ourselves there do exist approaches to social work which do not include computer technology, we will now move to Information Technology.

## INFORMATION TECHNOLOGY

> Man is standing at the threshold of a period of innovation in a new societal technology based on the combination of computer and communications technology. The substance is information, which is invisible (Masuda, 1980).

### The Computer

Epitomizing technological influence upon society is the computer which changes our image of the machine from that of a transducer or transmitter of power to that of a transmitter of information (Weizenbaum, 1976). It is:

> . . . not only an analytical engine, but an evocative object, an object that fascinates, disturbs equanimity, and precipitates thought (Turkle, 1984).

Charles Babbage, 19th century inventor, is generally given credit for the invention of the modern concept of the computer. The first computers were Colossus I, in United Kingdom in 1943, and ENIAC, built in the United States in 1946 (Pask & Curran, 1982). The machines were primarily for military goals which included enemy message code deciphering and for high speed calculation of flight characteristics for projectiles. ENIAC covered three thousand cubic feet and weighed thirty tons. It could be kept running only a few minutes at a time, and its memory capacity was just twenty words of ten figures each. The total number of words it could remember for instruction was three hundred (Pask & Curran, 1982).

The 1947 invention of the transistor presented a small, cheap and reliable replacement for the formerly used thermionic valves, and in 1956, the first transistorized computer was built. The microchip combined thousands of transistors into a chip of silicon less than one-quarter of an inch square, and presently one of these chips can be purchased for a few cents. One of these silicon chips contains as much computing power as ENIAC did (Pask & Curran, 1982). The next step anticipated by some is the biochip. This theory speculates that tiny computer circuits can be grown from the proteins and enzymes of living material. They would send signals similar to those sent and received by our brains, could repair and reproduce themselves, and would be ten million times as powerful as today's most advanced computers (Hopper & Mandell, 1987).

Comparing the computer with the automobile, if the automobile industry had developed as rapidly as the computer industry, today you would be able to buy a Rolls-Royce for two dollars and seventy-five cents, it would do three million miles per gallon, and it would deliver enough power to drive the Queen Elizabeth II (Gallo & Nenno, 1985). But lest we fall into the fault of viewing only technologies advantages, let us consider the disadvantages of the automobile.

> The average American male spends approximately four of his sixteen waking hours either driving his car, parking it and searching for it, or earning the money to make the payments on it, maintain it and replace worn parts, buy gasoline and oil, and defray the costs of a driver's license, vehicle registration, and insurance (Ehrenfeld, 1978).

Automobile accidents in Ontario has cost $231,000,000 and one million lost work days, and have killed more people in the last thirty years than both World Wars (W-5, 1982).

With these conflicting advances one should not be surprised if there exists some resistance to the technological intrusions computers are making in our lives, nor should we be shocked to learn society is not able to keep up with the implications for society which are inherent in their introduction. For example, Nilles (1982) has estimated that by the year 2000 nearly 95 percent of families will have computers even though the impact of computers on children's development and on socialization of the family have not received attention (Eyman, Ferrari, Morris, & Paris, 1985).

And let us not underestimate the influence of computers on business:

> Businesses go bankrupt from computer errors. An insurance-company survey showed that 90 percent of all businesses that experience a major loss of service due to a computer error go out of business after that loss (Hopper & Mandell, 1987).

Computer errors are generated through incorrect input, a program that does not anticipate every possibility, and computer hackers entering the program without authorization. Other errors are generated by not considering the limitations of real and integer arithmetic and power surges. Lastly, a program might be unintentionally designed so that it would not give the same response as a human being in the same situation (Hopper & Mandrell, 1987).

We should be aware of at least two fundamental facts when dealing with computers. These are summarized nicely by Jacques Vallee as follows:

> One of the founders of cybernetics, the late Norbert Wiener (1949), called it "The Science of Communication and Control in the Animal and the Machine." This definition, as Stafford Beer (1959, p.18) has since pointed out, suggests two ideas. The first is

> that distinctions between the animate and the inanimate, inherited from the Greeks, do not apply to the laws of regulation. The second idea is that communication is control, and, therefore, that information is control. Anyone concerned with computers must begin with this fact (Vallee, 1986).

Information Technology

> Valerie Geller of Bell Labs conducted an experiment that measured the "psychological arousal level" of several types of communication. Face-to-face communication ranked highest, and typewritten messages the lowest. Although video-conferences and telephone conversations ranked higher than typewritten messages, they still were inadequate substitutes for face-to-face discussions, especially important exchanges (Hopper & Mandell, 1987).

Some reactions to the new information technology made possible by computers have been cautious if not negative as is the following quote from Kerstin Aner (1979) in a Swedish report by the Commission on New Information Technology, Stockholm:

> It is necessary to bear in mind many side effects. One is that different groups have different means for making use of the new facility and that usually those previously well endowed in information now acquire more, unless special measures are taken. Secondly, that the computer technology can always be silently used to check who learns what. Thirdly, that an immense power accumulates among those who decide what shall be put into such a system and what shall be left outside (Geiss & Viswanathan, 1986).

Alternative futures of a Digital Society, or the Grapevine Alternative are available to us, depending upon how we choose to utilize information technology according to Vallee. The former allows computer technology to control people by reducing them to statistics, while the latter encourages communication between individuals through computer networking (Vallee, 1986).

Speaking of communications technology in particular, Harold Adams Innis suggests that a medium of communication used over a long period of time will influence the character of knowledge to be communicated, eventually creating a culture which will itself be replaced by another medium of communication as the old one becomes too restrictive (Kroker, 1984). And to Marshall McLuhan, each technology creates an environment considered corrupt and degrading, turning its predecessor into an art form. As this happens, technology becomes an art form in that it makes us aware of the psychic and social consequences of technology. Our nervous systems are extended over the globe through electrical technology, and western society must change.

> Western man acquired from the technology of literacy the power to act without reacting. The advantages of fragmenting himself in this way are seen in the case of the surgeon who would be quite helpless if he were to become humanly involved in his operation. We acquired the art of carrying out the most dangerous social operations with complete detachment. But our detachment was a posture of noninvolvement. In the electric age, when our central nervous system is technologically extended to involve us in the whole of mankind and to incorporate the whole of mankind in us, we necessarily participate, in depth, in the consequences of our every action. It is no longer possible to adopt the aloof and disassociated role of the literate Westerner (McLuhan, 1964).

Furthering this concept described above, McLuhan continues:

> Electric circuitry is Orientalizing the West. The contained, the distinct, the separate--our Western legacy--are being replaced by the flowing, the unified, the fused (McLuhan & Fiore, 1967).

Linguistics expert Benjamin Lee Whorf believes the underlying structure of a language controls the way people think about the world (Kroker, 1984) and so language demanded to communicate with computers may affect our thinking. Data processing, for example, is believed to

be affecting our language in two main ways. First, machines in data processing must be fed information in a formal language of mathematical algorithms which the machine understands and this is not necessarily the natural language we speak. Secondly, all people learning to communicate with computers are in fact learning to manipulate languages derived from English, and this phenomenon is changing the weight of linguistic equilibrium in the world (Telematics, C.B.C., 1983).

Norbert Wiener, responsible for the cybernetic theory of information by which man interacts more effectively with the computer, was both fascinated and frightened by the problems emerging from the central position occupied by the computer in society, when men depend on computers and man-computer interaction for maintenance of political, economic, and cultural stability. He pointed out complete intelligence and complete subservience do not go together, and suggested we:

> Render unto God the things that are God's, and to the computer the things that are the computers (Weiner, 1963).

We know information gives power and that power is usually exercised. Governments have realized the importance of information technology; as a brief look at the exponential growth of computers within government suggests:

> The Canadian Treasury Board's annual review of information technology and systems estimates that the installed base of microcomputers in the federal government was about 6,700 units on March 31, 1986. Large computers (equivalent to or more powerful than an IBM 370/158) totalled 57 in 1983, an increase of 11 over the previous year. Later figures on larger computers were unreported (Annual Report of the Privacy Commissioner, 1986).

On the larger international scale we have evidence which suggests the global village may not be a desirable phenomena for small countries

and minority cultures. The gathering and dissemination of international news is dominated by two American, one English, and one French agency, known collectively as the Big Four. Only slightly smaller than any of these is Tass (Telegrafnoye Agentstva Sovietskovo Soyuza), the state-operated agency of the Soviet Union. Global in their scope, these centralized agencies have caused concern for the United Nations Educational, Scientific, and Cultural Organization because of their domination of the information received by their countries and by foreigners which appears as economic and cultural domination to the developing nations (Rybczynski, 1983). Nor should one overlook the effect of foreign compiled and controlled data banks placing their particular bias on facts and history (Telematics, C.B.C., 1983).

## The Canada Privacy Act

Computers and data processing together have brought into being Canada's Privacy Act, which became effective July 1, 1983, and which is the federal government's code of fair information practices (Grace, 1987).

> The Act sets out the principles of fair information practices, requiring government to: Collect only the information needed to operate its programs; collect the information directly from the individual concerned, whenever possible; tell the individual how it will be used; keep the information long enough to ensure an individual access; and take all reasonable steps to ensure its accuracy and completeness (Grace, 1986).

Contentious issues for social policy are brought about by computerization in other areas besides employment. Information technology, referring to its creation through expenditures by the armed forces, started as a domination process, and nothing has occurred which allows

a reciprocal relationship of the general population with it (Telematics, C.B.C., 1983).

Two things are happening with information technology which are a cause of concern for some. First, that information about all of us is being recorded and stored on various computers by a variety of companies and agencies, sometimes without our knowledge or permission, and second, it is becoming technically feasible and very cheap to interconnect all of these machines so they share their information, again without our knowledge or permission. Related to this second point is the fact that there is no prohibition against this sharing of information by various data banks, with the exception of some operated by the federal government (Telematics, C.B.C., 1983).

The ease with which information collected on persons can be used for a purpose other than that for which it was originally collected can be illustrated by looking to Germany. There, it has been revealed that the Munich public library turned over lists of the last ten books used by each of their patrons to the Federal Office for the Protection of the Constitution, without the subscribers being aware of it. When one recalls the great issue of who read what in the McCarthy era in the United States in the 1950s, this becomes of greater significance (Telematics, C.B.C., 1983).

The second phase of Canada's Privacy Act anticipated in 1984 was to extend it to include federally regulated institutions, such as chartered banks, and companies regulated by Canadian Radio and Television Commission. These institutions were not bound by the Act upon its inception because of perceived disadvantages to their competitive position in the market place (Privacy Commissioner Annual Report, 1986).

Economic protectionism and sovereignty have been intertwined with privacy from the beginning, but the non-privacy issues tend to dominate, as is evidenced by the study "Privacy and Computers," completed by the Canadian departments of Communications and Justice, and quoted in the 1986 Annual Report of the Privacy Commissioner.

> . . . is not one of the privacy of Canadian data subjects being invaded by data about them being stored in the United States. It is rather that data processing and communications business may be lost to Canadians as a result of this foreign flow; that data in United States data banks might be preemptorily withheld abroad for a variety of reasons, that United States laws might change and leave Canadians less well-protected; and that, as a sovereign state, Canada feels some national embarrassment and resentment over increasing quantities of often sensitive data about Canadians being stored in a foreign country (Grace, 1986).

International organizations such as the Organization for Economic Cooperation and Development (OECD) and the Council of Europe have worked to keep privacy an integral part of transborder data flow considerations. But the efforts of these organizations for international control of data are minimized if adequate protection for personal data is absent within boundaries of individual nations, and so Canada formally committed herself to OECD guidelines in June 1984 to encourage private sector corporations to develop and implement voluntary privacy protection codes. As yet, however, there is no evidence on either the part of private sector or government to discharge this obligation (Annual Report of the Privacy Commissioner, 1986).

Information technology applied to groups and organizations are, as was explained above, already commonplace. We saw how, in a general way, the technology had serious implications for us both as citizens and as professionals. Our next topic is Management and Resource

Development, and it will discuss in detail how information systems are employed in a smaller, more immediate context.

## MANAGEMENT AND RESOURCE DEVELOPMENT

### Systems

As computers have made the task of storing data so easy we are amassing quantities of information whether we have a use for it or not. Three generally recognized forms of computer-based information systems are electronic data processing systems, with focus on record keeping and storage; management information systems, consisting of structured information flows aimed at middle managers; and decision support systems, emphasizing flexibility, adaptability and quick response (Geiss & Viswanathan, 1986).

As computers have become more vital in producing the kind of information that management needs, the management information system has evolved. The objective of this system is to set the correct information to the proper manager at the correct time in order to help them make wiser decisions. The four most common types of reports generated are scheduled, exception, predictive, and demand (Hopper & Mandell, 1987).

Computers are also being used as decision support systems or expert systems. In these systems a knowledge engineer captures the experience, wisdom and judgement of human experts and puts them on a computer for use by non-experts (Barrett, 1986). The system contains heuristics, or procedural knowledge consisting of inferential reasoning techniques as well as declarative knowledge, or knowledge of fact (Barrett, 1986). The history of computer applications in business shows

computer utilization grew from routine data processing to management information systems and these matured into total integrated information systems which the entire organization utilized when involved in decision making (Keen, 1980).

The decision support system should allow easy query into highly flexible and well-managed groups of data relevant to the situation at hand. The most important resource the human expert draws upon in analyzing and solving problems is his storage of factual or declarative knowledge, and of procedural knowledge of how things happen and what to do about it. Decision support systems enhance rather than replace the judgement of the decision maker (Schkade & Schoech, 1980), but so far the actual listening to the problem is a purely human art.

## Policy

Each professional and organization is responsible to ensure computers are used in an ethical manner as the future is not given; time is a construction with implied responsibilities (Prigogine, 1986). Consumers of social services seek out their resources when they are in crisis, and are not in a position to establish quality of service they will receive. Indeed, even professionals themselves have difficulty in evaluating quality of social services (Hurl, 1986). Government monitoring of social services in private agencies has been suggested, but costs and time of such a function discourage this. Nor should it be overlooked that private agencies and government often exist in a state of mutual dependence, giving agencies more power to resist government controls (Hurl, 1986). Finally, it should also be noted that present day hopes of governments for public goals to be cared for by private interests in United

States, Britain and France encourage decentralization of control and, with it, difficulty to monitor standards in what some feel will be the decade of scarce resources (Poole, 1985).

Since the 1960s, as more public money is spent on social services, society's expectations have increased for social accountability, and for an increased emphasis on the greatest good for the greatest number (Hoffman, 1986). With few studies showing computerization is not more efficient and cost effective, they may be quickly utilized for these reasons alone.

Without considering any of the ramifications of their utilization, the human services could, albeit unwittingly, contribute to the already discussed alleged problems which the technological approach to life brings with it. This is not to suggest computers should not be utilized in human services; rather that their utilization should be accompanied by considerations as well as those dictated by the technological imperative. This has been succinctly expressed as breaking the enchantment of technique and technological thinking, replacing it with a free relationship where humans are able to choose (Burch, 1984).

Unfortunately, the computer can fill the need of those who wish to avoid the personal responsibility for dangerous or disastrous decisions by placing the responsibility on a mechanical device which one cannot fully understand but which has presumed objectivity (Weiner, 1964). The informed professional, like the informed citizen, should be familiar with technology he is using as well as with the effect it is having on society.

> Citizen participation is essential for voluntary decision making and to avoid an Orwellian state. If controlled by a despotic state organization abuses

> would exceed present alienation of man in the present industrial society, or the violations under present dictatorships (Masuda, 1980).

Philosopher George Grant has attributed to Martin Heideggar the opinion that capitalism and communism are predicates of the same subject - technology (The Moving Image of Eternity, C.B.C., 1986). When technological innovations are introduced to a human setting the problem is often not one of man versus machine but rather the longer established one of man versus man (Rybczynski, 1983).

The ethical guidelines already presented do not really address the larger social policy issue as skilled workers are replaced by machines. Called de-skilling, workers are reduced to being system operators at best, or lose their jobs entirely. Computer scientist Joesep Weizenbaum suggests a sort of social invention will have to be created to see that the new wealth that is created by increased manufacturing efficiency is redistributed to those who have been displaced by the improvements (Willis, 1985).

One of the more widely known examples of this in Canada is the Canadian Bell Telephone Company and its automation program, known as TOPS, which began in the late 1970s. Management and workers are in complete disagreement over the virtues of the automation, and the example illustrates the fact that computer technology affects people differently.

Maximizing profits through technological implementation has worked for Bell and an added bonus has been the company's increased control over the work force in three main areas. First, the automated switching system feeds calls to operators so they have lost control of their pace of work; and second, the company is less vulnerable to strike. Finally,

management is now able to decentralize its operations and isolate individual operators from each other, making communication and organization with each other more difficult (The Microchip Battleground, C.B.C., 1983).

Contrasting management's successful view of computer technology one must consider opinion of the workers. For them, technology has multiplied health hazards, increased dull, monotonous work, and caused a large number of them to lose their jobs (The Microchip Battleground, C.B.C., 1983).

But companies and manufacturers are also feeling pressure from micro-electronic technology and suggest the battles in the upcoming decades may not be over natural resources, but rather over a country's ability to make strategic business decisions correctly. With a robot costing approximately $4.80 per hour to operate, compared to the average worker's salary of $15.00 per hour, perhaps technology has kept jobs in the United States preventing loss to to less developed countries where wages are from $1.00 to $5.00 per hour (Hopper & Mandell, 1987). This view also suggests state of the art technology is required in Canada, particularly because of our high standard of living and generous social programs (The Microchip Battleground, C.B.C., 1983).

Technology is repeatedly called upon to solve problems caused by technology. Is social work aware of the problem-solved, problem-created nature of technology? And if it is, what can the profession do about it which will not contribute to furthering the problem? Surely these questions must be dealt with if the profession is to retain its credibility, and so, to ignore computer technology is not a viable option. We now

move to examine the state of social work and other human service professions with regard to computer technology.

## ACTIONS AND APPLICATIONS

### Other Human Service Professions

Computers have been used in psychiatric admitting units and found to provide physical, psychological and social information comparable to or superior to the quality produced by an experienced physician aided by ancillary staff. Patients were favorably disposed to the assessment, and the procedures cost only a fraction of the manually completed intakes (Klingler, Johnson & Williams, 1976). It has been speculated that utilization of computer technology in intake procedures may improve the product of such procedures and also allow for more efficient and appropriate use of human resources because it objectifies and standardizes the intake, freeing the worker from clerical and record keeping labour (Parsonage, Urban & Vondracek).

Automated history taking in child psychiatry was found to be generally accepted by mothers of children, with half of them saying communicating with the computer was as easy as talking with their doctor, and 67.5 percent saying they were able to be as frank with the computer as they were with their doctor, and 15 percent said they could be more frank. The study concluded the computer did successfully distinguish the sick from the not sick population (Coddington & King, 1972). It has also been concluded that a technician-administrated, structured interview with a computerized diagnostic program for psychiatry was as accurate and more cost-effective than using clinicians (Johnson, Giannetti, Klingler & Williams, 1980).

In a computerized interview to establish suicide risk, it was found patients preferred the computer interview to talking to a physician, and, in a retrospective study, it was found the computer was more accurate than clinicians in predicting suicide attempts (Greist, Gustafson, Strauss, Rowse, Laughren & Chiles).

Psychologists have compared the results of tests administrated on paper with computerized versions and found the computerized Minnesota Multiphasic Personality Inventory to be faster to administer and score (Russell, Peace & Mellsop, 1986), and other comparisons suggested respondents more open and truthful in computer tests than paper and pencil ones (Hart & Goldstein, 1985). This result concurs with earlier validation studies (Webb, 1970) which demonstrated computer reports equal to or better than clinically interpreted ones (Fowler, 1985).

Social Work

The limited impact of computers in clinical social work (Gripton, 1985) and resistance to computers in social services seems to revolve around the three areas of knowledge, attitudes, and training (McIntyre, 1986).

Most social service professionals are neither well-informed about what computers can do nor about how they can be applied to enhance the quality and quantity of service delivery (Hoshino & Reinoehl, 1982). They believe computers to be dehumanizing and threatening to confidentiality (Gruber, 1974; Hill, 1971).

These examples have thus far had the client interact with a computer, and then a professional. It cannot go unnoticed, however,

that the consensus seems to be the computer can be effective when used for self-education, breaking of habits, and changing life-styles, even without the assistance of a professional (Wakefield, 1985). Areas covered in these programs include sex therapy, parenting skills, anxiety control and depression.

In terms of information management, Wisconsin in United States utilized computers to assess eligibility of applicants for financial aid, and to generate that aid in form of a cheque for those eligible. Management concluded the system slashed hours and weeks from time taken to provide financial assistance; and also that it assured equal treatment for all clients across the state (Data Process, 1980).

Child welfare agencies have been utilizing expert systems to place children in foster homes (Schuerman & Vogel, 1986; Poertner & Rapp, 1980; Jaff, 1979) and to record and process new client intakes. They have also assisted in case and program management, and in organizing agency resources.

Negative attitudes to the new technology (Greist, 1984; Sutton, Eller & Schoech, 1983/84; Space, 1981) may result from automation threatening professionals because of the speed and accuracy with which data can be managed, and the tireless capacity of the system (Glueck, 1984). These attitudes in their extreme have been labelled computerphobia, thinking that whatever is entered into the computer may be lost; computerphilia, thinking computers can solve the world's problems; and technophobia, fear of computers and other forms of technology (McIntyre, 1986).

In future the social work practitioner may not be left to decide on his own whether he utilizes computer technology or not in he dealings

with client populations. Recent court rulings in the United States condemned medical doctors who failed to consult a computer in their diagnosing and treatment of patients (Ehrlich, 1982). It has also been predicted there will be a flood of litigation involving unqualified users of computer tests (Matarazzo, 1983) and there are few legal guidelines for figuring out who is responsible for computer-generated errors (Hopper & Mandell, 1987).

Absence of training of social workers in the use of computers is causing resistance to implementation of the technology; and a survey of the small number of schools of social work offering computer-related courses suggests they are not keeping pace with the needs of practitioners or management (Schoech, 1982). Human services personnel without training in computers who decide to develop and utilize their own particular forms of computerization help create combatability problems between systems and this is at a cost of efficiency and convenience (Catchpole, 1985). It has also been found the complexity of technology employed by an institution or organization influences the power structure of the organization in which it is found (Perrow, 1965).

Referring to the fact that most considerations focus on the instrumental power of the computer, Turkle addresses its subjective nature and points out we may be too preoccupied with what we can do with the computer and not enough with what it can do with us (Turkle, 1984).

> In particular, there is the risk of forming a relationship with the computer that will close rather than open opportunities for personal development. While for some children the computer enhances personal growth, for others it becomes a place to "get stuck." For adults as well as children, computers, reactive and interactive, offer

> companionship without the mutuality and complexity of a human relationship. They seduce because they provide a chance to be in complete control, but they can trap people into an infatuation with control, with building one's own private world (Turkle, 1984).

These suggestions of machines influencing our minds and creating worlds without our being aware of it has serious implications for social work as was seen in our discussion of technological approaches to reality. We must now contemplate the scenario where an individual consults a social worker because of problems related to his technological environment and the social worker responds by introducing the individual to a computer for assessment. One might expect the individual would leave feeling that the interaction with the machine was preferable to interacting with another human being because he had not been forced to experience his problem of human interaction. One would have to question the long-term effectiveness of this type of counselling if not the ethical implications of it.

Many of the ethical guidelines presented are based on the assumption that computer-assisted assessments are a desired phenomenon, and do not address the concern expressed by the computer scientist authority Joseph Weizenbaum, that it is a very dangerous assertion that machines will be able to address human problems, things that have to do with dignity and human values (Willis, 1985).

Computers have permeated society and human services. Unless social workers take charge of the automation, other professions will, and these results may be very much in conflict with human service values and goals (Schoech, 1979). Computer scientist Joseph Weizenbaum has pointed out that computer limitations seem to be overlooked by their advocates. For example, computers still acquire information in what has

been described as a spoon-fed manner, and secondly, it is not at all obvious that all human knowledge is encodeable in information structures. Third, there are some things humans come to know as a consequence of being treated as human beings by other human beings, and finally even the kinds of knowledge that appear superficially to be communicable from one human being to another in language alone are actually not so communicable (Weizenbaum, 1976). Technology cannot replace the human quality of wisdom.

> It may look now as if people educated to use our newest technologies efficiently are the world's elite, but in the long run I believe that people educated to have, as well, that point of view that used to be described as humanistic--the long-term, over-all, contemplative point of view--will turn out to be more influential. Simply because they understand more of what is going on in the world. It is not that I undervalue the new technicians. On the contrary. It is only that what they know is by definition a temporary necessity (Lessing, 1986).

## SUMMARY

This literature review has revealed questions and issues which present themselves along with the advent of computer technology in society. They may be briefly summarized as ethical and moral dilemmas, issues as to whether the benefits provided by technology are worth the price they demand in human terms, and whether social welfare educators are prepared to lead the profession in dealing with the first two issues.

# CHAPTER THREE

# METHODOLOGY

Social welfare educators are in a position to both reflect and create attitudes within the social work profession. Their awareness of and position on issues presented in the literature review are crucial to understanding the relationship between technology and the profession of social work. This study now embarks upon the task of exploring the attitudes and opinions of social welfare educators at The University of Calgary toward computer technology. To accomplish these ends, both empirical quantitative data and subjective qualitative data was collected with procedures now to be explained.

## Subjects

The subjects of this study were all full-time instructors and sessionals at The University of Calgary Faculty of Social Welfare. This group includes twenty-three from Calgary, six from the extension faculty located at University of Alberta in Edmonton and five from the extension faculty located at University of Lethbridge. Twenty-one were male, 12 female and 1 un-recorded. Age groupings were 13 persons between 26 and 40 years, 16 between 41 and 55 years, and 4 persons 56 or over. Formal education ranged from Bachelor to Doctoral degrees, while years teaching ranged from 1 to over 25 years, with a mean of 11.4, and a mode of 1 year. To help preserve anonymity, respondent results were not broken down by program location, and respondents were informed of this before they committed themselves to participating in the research. With one exception, those on sabbatical leave were excluded due to

problems of accessibility. Since 100 percent of the designated population was used in the study, no sampling procedures were utilized.

## Instrumentation

This study utilized both written questionnaire and personal contact approaches to gathering information from the subject population. The instrument (Appendix C) was entitled "Computer Attitude and Social Issue Questionnaire" and was made up of five sections entitled Demographics, Computers and Computer Users, Value and Impact of Computers on Canadian Society, Concerns Regarding Computerization, and Computers and Social Work.

Independent variables for the study were included in Section One of the questionnaire and were eight in number. Gender, age, level of formal education and years of teaching constitute the first four. It was anticipated that these would examine for sexual bias, as well as for indications that established social work educators could not or would not change their established paradigms of educating and, therefore, would not embrace computer technology.

Regarding computer use, the four ratings were (5) Have you ever used a computer? (6) Do you consider yourself to be computer literate? (7) Do you use a computer at home? and (8) Do you use a computer for work-related tasks? These independent variables dealing with computer use found 7 respondents stating they used a computer sometimes and 15 stating they used one often. Seventeen classified themselves as being computer literate while 6 and 11 rated themselves as using a computer in their homes sometimes and often respectively. With regard to using a computer at work, 8 respondents rated themselves as using it a little, 4

as using it sometimes, and 17 as using it often. These independent variables were selected to establish the effect frequency of computer use has on attitudes and opinions toward computer technology. Each of these independent variables was examined for a relationship with the dependent variables.

Dependent variables were contained in Section II to V and totaled 89 in number plus one request for respondents to "Write a paragraph giving the meaning and feeling that computer technology has for you."

Most of the dependent variables in this study were taken from two questionnaires which already had established validity and reliability. The first questionnaire adopted for this study was entitled "Opinions About Computers" (Gripton, 1986) and appears in this study's questionnaire as variables 9 through 28. These twenty questions had established Alpha reliability coefficient of .80, and scale items had a correlation of .20 with the total scale score less than the score for that item. This reliability and validity was established using 226 subjects which provided heterogeneity along dimensions of age, gender, occupation and education.

The second questionnaire utilized in this study was from Computers and Canadian Youth: A Study in Attitudes Toward Micro-Electronic Technology (Kass & Kieran et al., 1986). The study began in February 1985 and is expected to have its results published in fall of 1987.

> The purpose of the national study is to investigate access to computers, values and feelings held toward computers, and salient social issues with respect to computers as seen by Canadian Youth (Kass & Kieran, 1986).

Parts D, E and F of "Computers and Canadian Youth Project Student Questionnaire" were adapted by this study, and became variables 29 to 88 in it. The items were aimed at defining and clarifying:

> 1) attitudes and 2) feelings evoked by computers and their use, 3) perception of relationships with computers, others and self, 4) status of computers compared to persons or other objects, 5) pertinent personal issues related to computer use and presence (trust, privacy, power, security) and 6) pertinent social issues (privacy, control of information, perceived values of computers to various institutions, communities and political organizations (Kass & Kieran et al., 1986).

The national study administered three respective pilot questionnaires in English and French to school youths in Alberta, Ontario, Quebec and the Maritimes and interviews with the students were conducted. Factor analysis (which had a Hoyt Reliability of 0.64) on 16 statements regarding computers and computer users reduced the number of dimensions to two, valuing the computer as an information source and valuing the computer for learning and related effective concerns.

Factor analysis on 37 statements (which had a Hoyt Reliability of 0.94) about computers and society revealed Factor One as dealing with the computer as problematic in society, factor two dealing with work issues including gender/work issues, and factor three dealing primarily with legal or legal social issues. It was concluded the scales do measure values and issues as well as affective reactions to computers, but also that such values and reactions are complexes of constructs and, therefore, should be presented to respondents in that form.

Part F of the "Computers and Canadian Youth Project Student Questionnaire" became variables 64 to 88 in this study. These items were developed by the Micro Electronic Technology and Canadian Youth

study from rankings established by Cordell (1985) in a study of Ontario adults. Comparing these Ontario results with rankings of Alberta youth revealed similar, although not identical results, and it was concluded the subscale was useful in portraying social issues and related values regarding computers. The issues were job security, spread of personal information, government control, pay reduction and computer crime.

Section Five of this study consisted of variables 89 to 98, and had no established validity or reliability. Variables 89 to 96 ask for Likert scale rating on statements about computers and social work, while 97 asks for a rating on if computers should be a required subject at the B.S.W. level. The last item on the questionnaire was number 98 which requested a descriptive paragraph described the meaning and feeling of computer technology to the subject.

## Research Design

Each individual in the study population was approached personally on their respective university campuses by the researcher. The consent form (Appendix B) was presented to them and discussed. Groups in Edmonton and Lethbridge agreed to be addressed during their scheduled staff meeting, with the researcher staying until after the meeting to answer any further questions in private. Personal contact was made by the researcher after the questionnaire was completed in all but three instances, and in some cases, discussions ensued around the questionnaire or its topic.

During the initial contact it was clear some faculty members had concerns regarding computers in social work and these had to be addressed before they would participate. These concerns centered

around how the data would be interpreted and how the data would be used, with apprehensions expressed as to how accurately quantitative analysis would represent their views of computers in social work. This experience illustrates the importance of a phenomonological approach to discovering what computer technology means to social welfare educators, and more will be said on this in Chapters Four and Five.

## Data Analysis

Data obtained in the questionnaire was analyzed using Statistical Package for Social Sciences, (Nie, Hull, Jenkins, Steinbrenner and Bent, 1975). The eight independent variables are first examined for relationships with the aggregate score from each questionnaire section using Pearson Correlation Coefficient. After this, a more detailed analysis is undertaken when the eight independent variables are examined for correlation of $r = .38$ or stronger with specific dependent variables contained in the questionnaire. This information will reveal the nature of the relationship between the two variables and in so doing, give an idea of the attitudes of Faculty of Social Welfare instructors toward computer technology. The qualitative paragraph response is interpreted from perspective of the effect and influence of computer literacy upon the meaning and feeling computer technology has for respondents. It is hoped this will provide insight into the effect which computer literacy has upon feelings and meanings the technology has for the two groups of respondents.

# CHAPTER FOUR

# RESULTS

This chapter presents statistical manipulations which relate the eight independent variables to results obtained from the "Computer Attitude and Social Issue Questionnaire" included in Appendix C. Data is presented here as it was obtained in the four questionnaire sections of Computers and Computer Users, Value and Impact of Computers in Canadian Society, Concerns Regarding Computerization, and Computers in Social Work. The complete questionnaire is reproduced in Appendix C so exact wording of variables may be reviewed.

To examine for strength and direction of relationship of independent variables with dependent variables Pearson's Correlation Coefficients were calculated and these are presented following each aggregate score table. Because of space limitations only those with a minimum correlation of $\underline{r} = .38$, $p = .05$ have been reproduced in the specific variable tables as this nears the recognized strong correlation of $\underline{r} = .40$ (Grinnell, 1981). As this type of statistic only measures a relationship in which the data falls on or near a straight line (Horwitz & Ferleger, 1980) scattergrams were visually examined for a curviliner relationship (Campbell, 1974), and none were found. It also must be noted skewness tends to lower high correlations while leaving low correlations unaffected (Gorsuch, 1974).

The Likert scales in this study's questionnaire were found to be too restrictive by some subjects in the study, although they understood the advantages of using it to obtain quantitative data. As well as verbalizing frustrations with this type of linear information gathering, some wrote

responses in the questionnaire margins either criticizing the question, or asking for clarification. One example of this is where a respondent asked for a definition of family life so a response could be given to "Computers have a negative effect on family life."

Two other familiar problems with Likert scales were noted. First, on the one to five scale, three represented no opinion, although a respondent who had not decided on an issue could have strong opinions toward both ends of the scale. Adding undecided to the number three choice in the scale would have remedied this problem. The second problem noted was that slightly agree, choice number two, is logically speaking equivalent to choice number three, slightly disagree. In spite of these two difficulties, respondents were considered able to distinguish between the responses because of the context in which they were used (Phillhiber, Schwab and Sloss, 1980).

Although one might conclude that as university instructors this population was more accustomed to asking questions than answering them, it is noteworthy that few, if any, of these instructors use quantitative testing. It is the established norm in the Faculty of Social Welfare to examine a student's learning with qualitative analysis, and that demonstrates their belief in the effectiveness of the approach.

The results presented in Chapter Four are discussed and interpreted in Chapter Five.

## Computers and Computer Users

Pearson Correlation Co-efficient was completed with the eight independent variables and questionnaire results of this section. Aggregate results of this data for variables 9 to 28 are presented in

Table 4.1. These variables are treated as a unit because they are from the "Opinions About Computers" questionnaire designed by Gripton (1984). Variables 29-40 are from "Computers and Canadian Youth Project Student Questionnaire" and dealt with in Table 4.1(a) individually.

Table 4.1
Pearson Correlation Co-efficient for Independent Variables and Aggregate Score from Computers and Computer Users

| | r | p |
|---|---|---|
| Gender | -.097 | .305 |
| Age | -.286 | .060 |
| Education | .274 | .075 |
| Years teaching | .175 | .181 |
| Have you ever used a computer? | .402 | .014* |
| Do you consider yourself computer literate? | -.246 | .099 |
| Do you use a computer in your home? | .285 | .063 |
| Do you use a computer for work-related tasks? | .286 | .063 |

* Significant at .05 level one-tailed test

Table 4.1 shows one strong correlation between "Have you ever used a computer? and aggregate score from Computers and Computer Users.

Table 4.1(a) shows correlations of independent variables with selected dependent variables which achieved a relationship of $r = .38$ or stronger in this test section.

Table 4.1(a)

Pearson Correlation Co-efficient of Independent Variables with Selected Variables From Computers and Computer Users*

| | Dependent Variable | r | p |
|---|---|---|---|
| Gender | ** | ** | ** |
| Age | V17 | -.392 | .011 |
| | V18 | -.380 | .013 |
| | V25 | -.393 | .011 |
| Education | ** | ** | ** |
| Years teaching | V15 | .404 | .011 |
| Have you ever used a computer? | V9 | .518 | .001 |
| | V18 | .435 | .006 |
| | V22 | .554 | .000 |
| | V26 | .449 | .004 |
| Do you consider yourself computer literate? | V17 | -.425 | .008 |
| | V22 | -.420 | .009 |
| Do you use a computer in your home? | V9 | .590 | .000 |
| | V22 | -.591 | .000 |
| | V25 | .403 | .010 |
| Do you use a computer for work-related tasks? | V9 | .518 | .001 |
| | V22 | .477 | .003 |
| | V26 | .387 | .013 |
| | V31 | .401 | .010 |

* Significant at .05 level one-tailed test.

** No correlations stronger than $r$ = .38 were observed.

Table 4.1(a) shows 17 correlations stronger that $r$ = .38 between independent variables and dependent variables from Computers and Computer Users.

## Value and Impact of Computers in Canadian Society

Pearson Correlation Co-efficients were computed for the designated eight independent variables and questionnaire results of this section. Results of this data manipulation are presented in Table 4.2.

Table 4.2

Pearson Correlation Co-efficient for Independent Variables and Aggregate Score From Value and Impact of Computers in Canadian Society

| | r | p |
|---|---|---|
| Gender | .188 | .159 |
| Age | -.228 | .113 |
| Education | .138 | .237 |
| Years teaching | -.170 | .189 |
| Have you ever used a computer? | .488 | .003* |
| Do you consider yourself computer literate? | -.299 | .057 |
| Do you use a computer in your home? | .347 | .030 |
| Do you use a computer for work-related tasks? | .361 | .025 |

* Significant at .05 level one-tailed test

Table 4.2 shows one correlation stronger than $r$ = .38 between "Have you ever used a computer?" and aggregate score results from Value and Impact of Computers in Canadian Society.

Table 4.2(a) shows correlations of eight independent variables with selected dependent variables which achieved a relationship of $r$ = .38 or stronger in this test section.

Table 4.2(a)

Pearson Correlation Co-efficient of Independent Variables with Selected Variables from Value and Impact of Computers in Canadian Society*

| | Dependent Variable | r | p |
|---|---|---|---|
| Gender | ** | ** | ** |
| Age | V44 | -.392 | .011 |
| | V53 | -.473 | .002 |
| | V55 | -.510 | .001 |
| | V58 | -.407 | .008 |
| | V62 | -.418 | .007 |
| | V63 | -.455 | .003 |
| Education | ** | ** | ** |
| Years teaching | V61 | -.432 | .007 |
| Have you ever used a computer? | V44 | .446 | .005 |
| | V46 | -.387 | .013 |
| | V54 | .624 | .000 |
| | V58 | .679 | .000 |
| | V59 | .614 | .000 |
| Do you consider yourself computer literate? | V44 | -.519 | .001 |
| | V54 | -.422 | .008 |
| | V58 | -.586 | .000 |
| | V59 | -.517 | .001 |
| Do you use a computer in your home? | V54 | .407 | .009 |
| | V58 | .530 | .001 |
| | V59 | .414 | .008 |
| Do you use a computer for work-related tasks? | V44 | .489 | .002 |
| | V54 | .611 | .000 |
| | V58 | .710 | .000 |
| | V59 | .570 | .000 |

* Significant at .05 level one-tailed test
** No correlations stronger than $\underline{r}$ = .38 were observed.

Table 4.2(a) shows 23 correlations stronger than $\underline{r}$ = .38 between independent variables and dependent variables from Value and Impact of Computers In Canadian Society.

## Concerns Regarding Computerization

Table 4.3 shows Pearson's Correlation Coefficient and Significance for Independent Variables and Concerns Regarding Computerization.

Table 4.3

Pearson Correlation Co-efficient for Independent Variables and Aggregate Score From Concerns Regarding Computerization

| | r | p |
|---|---|---|
| Gender | .026 | .449 |
| Age | .239 | .115 |
| Education | -.050 | .404 |
| Years teaching | .180 | .190 |
| Have you ever used a computer? | -.166 | .205 |
| Do you consider yourself computer literate? | .072 | .364 |
| Do you use a computer in your home? | .011 | .478 |
| Do you use a computer for work-related tasks? | -.117 | .280 |

Table 4.3 shows no correlations stronger than $r$ = .38 between independent variable and aggregate scores from Concerns Regarding Computerization.

Table 4.3(a) shows correlations of eight independent variables with selected dependent variables which achieved a relationship of $r$ = .38 or stronger in this test section.

Table 4.3(a)

Pearson Correlation Co-efficient for Independent Variables and Selected Variables from Concerns Regarding Computerization*

| | Dependent Variable | r | p |
|---|---|---|---|
| Gender | ** | ** | ** |
| Age | V74 | .439 | .006 |
| | V82 | .391 | .011 |
| Education | V84 | -.459 | .005 |
| Years teaching | V66 | .391 | .013 |
| Have you ever used a computer? | ** | ** | ** |
| Do you consider yourself computer literate? | V84 | .464 | .005 |
| Do you use a computer in your home? | ** | ** | ** |
| Do you use a computer for work-related tasks? | ** | ** | ** |

* Significant at .05 level one-tailed test.
** No correlations stronger than $r$ = .38 were observed.

Table 4.3(a) shows five correlations stronger than $r$ = .38 between independent variables and dependent variables from Concerns Regarding Computerization.

Computers and Social Work

Table 4.4 shows results of the computers in social work section. Respondents were requested to consider their opinions in light of either computer-assisted assessments or computer decision support systems in mind. The reader is reminded these questions were not pre-tested, and have no established reliability or validity.

Table 4.4

Pearson Correlation Co-efficient of Independent Variables and Aggregate Score from Computers and Social Work

| | r | p |
|---|---|---|
| Gender | -.250 | .104 |
| Age | -.171 | .192 |
| Education | -.069 | .370 |
| Years teaching | .339 | .045 |
| Have you ever used a computer? | .088 | .332 |
| Do you consider yourself computer literate? | .141 | .247 |
| Do you use a computer in your home? | -.074 | .356 |
| Do you use a computer for work-related tasks? | -.034 | .434 |

Table 4.4 shows no correlations stronger than $r$ = .38 between independent variables and aggregate scores from Computers and Social Work.

Table 4.4(a) shows correlations of eight independent variables with selected dependent variables which achieved a relationship of $r$ = .38, p = .05 in this test section.

Table 4.4(a)

Pearson Correlation Co-efficient for Independent Variables and Selected Variables from Computers in Social Work*

| | Dependent Variable | r | p |
|---|---|---|---|
| Gender | 96 | -.398 | .013 |
| Age | ** | ** | ** |
| Education | ** | ** | ** |
| Years teaching | V96 | .550 | .001 |
| Have you ever used a computer? | ** | ** | ** |
| Do you consider yourself computer literate? | ** | ** | ** |
| Do you use a computer in your home? | ** | ** | ** |
| Do you use a computer for work-related tasks? | ** | ** | ** |

* Significant at .05 level one-tailed test.
** No correlations stronger than r = .38 were observed.

Table 4.4(a) shows two correlations stronger than r = .38 between independent variables and dependent variables from Computers in Social Work.

The implications of these correlations will be discussed in Chapter Four. Before doing that, however, the qualitative paragraph which was requested of respondents will be reproduced. Contents of these will be discussed in Chapter Five.

## The Qualitative Response

Independent variable six was used to dichotamize results of the request for respondents to "write a paragraph giving the meaning and feeling that computer technology has for you." Fifteen respondents rated themselves as computer-literate, twelve as not computer-literate, and one did not answer the question regarding computer literacy. Of those not responding to question 98, two were computer literate and four were not.

Computer literate responses:

1. Computer technology has great importance for work and occupations that involve information processing. This involves more and more occupations, and social work in particular. Computers, however, operate with particular modes of informative handling and accept data only in certain formats. Forms of data and ways of processing information that are important to social work (and other human service organizations) may sacrifice important dimensions of practice in utilizing and conforming to the requirements of computer information processing.

2. Computer technology aids in the manipulation of large amounts of data, and for me, has the main advantage of speeding up both data analysis and writing.

3. Set ideas, some questions are self-evident; computers - dumb animal, can be used to help people; I depend on support staff. Machine can't be anti-human because that is a human characteristic - they have no attitudes.

4. Clearly, the computer is seen, for me, to be a tool to make my professional duties easier. It save me an enormous amount of time. I primarily use it for word processing and statistical analyses. These two operations, for me, help me to be more productive. I look forward to the time when I can dictate into a computer and avoid the tedious, onerous task of typing data. The potential of computer assisted diagnosis is a very intriguing concept. I would utilize such technology.

5. It is a helpful tool for my word processing and writing, also for storing and retrieving information. I don't like it for analysis because it becomes too bound by "Euro-centered" monocultural math and science - too value laden. We (social scientists) fall in love with computers/statistical analysis and fail to see the values we promulgate in so doing. The analytical packages are not neutral - they support atomistic/Newtonian-Cartesian scientific principles which are outmoded and destructive of human life. Anyway, it hurts my eyes and mind after an hour or two.

6. I like the access to information that computers allow, and the playing with information. If used in humanistic ways, computers can be very helpful. They can also be used to oppress and control. A concern I have is who controls information, data bases, etc. If there is more centralization and control, I see problems. If more networks spring up, computers can facilitate interaction and creativity. I see a major struggle growing in this area.

7. Computers can offer tremendous help to social workers as they expand our data storage and thus we can access more information to apply in our practice. The word processing and filing capacities of computers allow us to work much quicker-efficiently and quantity of

work increases. The only problem is the initial learning to become computer literate.

8. In general, while I am only moderately computer-literate, I feel that computers (all kinds) are a godsend. . . they assist people in space walks from orbiting vehicles, monitor cardiac patients, speed-up lab technology, etc. My computer, when I know better how to use it, will allow me to sort and analyze data that would have (ordinarily) taken me the rest of my working career to analyze if I were using "manual" techniques. I am concerned, however, when pink-collar ghetto women are "strapped" to a computer, hours on end, in splendid isolation, for yeoman wages. This is, I feel, more a problem with human values, working conditions, etc., than with the machines). Unfortunately I don't accept the same or parallel reasoning when the American Rifle Assoc. uses it! (they believe guns don't kill; people do.

9. I believe computer technology can be an invaluable aid and tool. Computers have been enormously helpful to me - particularly in terms of writing and storing information. I am cautious about seeing computers in any form of technology as more valuable than human contact.

10. My main dilemma right now is whether to upgrade to a new system, or wait for new technology/lower prices. I find the logic and concentration computers require soothing, relaxing, comforting. The computer is my curator. It only gives me answers I want, unlike spouse/children/colleagues.

11. Computer technology has helped by taking over and making efficient many of the routine administrative tasks that affect my personal and professional life. Computers help me see patterns. I can move quickly to issues and implications because the data analysis is so quick. Computer technology has improved communications in northern and rural parts of this country. The negative effects have been more with the users and planners than with the technology. Resources have been allocated for systems far beyond the limited needs in many agencies.

12. I view the computer as an extremely useful tool that can assist me in my work. I find that the computer is enjoyable to use and do not feel intimidated by it in any way. Like statistical methods though the computer is only as good as the person using it, I find the attitude, held by many people, that computers are somehow "mysterious and magical" to be very disturbing. All that is necessary to use a computer is to develop a certain way of thinking and problem-solving that is orderly and logical. My experience with many people learning to use the computer is that they are very impatient and expect to acquire the necessary skills and knowledge instantly, and with a minimum of effort on their part. In fact, becoming proficient with computers is similar to any other endeavor - it takes practice. Perhaps the aura of magic and reputation for speed that have overhung the computer leads people to think they

should be easier to learn. In reality, it is not difficult - but it takes effort and practice.

13. Tremendously enhanced ability to handle large amounts of data. Am excited about possibilities for social work, e.g., storage of data re successful practice with the possibility of generating predictors and assessment tools. Fantastic tool in storing and updating lecture material. Has saved time and that time can be used in reading, updating, keeping material current. Great research tool. Personally find it fun to use.

14. Computers are a new and largely unknown frontier which has changed all our lives. There are critical choices to be made in the utilization of this technology. It should not be ignored or left to the technocrats. It is an area in which social workers should become much more involved.

15. A computer is efficient and effective and saves an unbelievable amount of time for me. Secondly, it permits me to carry out very sophisticated research via complex programs that would not be possible otherwise. Thirdly, it permits me to deal with very large data bases that five years ago would not have been possible. The computer, therefore, allows for both creativity and efficiency at the same time.

Not Computer Literate Paragraphs:

16. I find this topic totally unacceptable, as I am not certain to what degree it will be used for administration to make a more technological . . . student. I have many severe reservations regarding the usage and with particular emphasis on social work. It is my impression that regardless of this research the Faculty will continue to promote this type of technology as an end and of itself.

17. Computers may have a place in human services in assisting or supporting decisions but need to be used with professional sensitivity and as a tool (one of many) in the helping and/or management context. It would be to students advantage to be knowledgeable and skilled in the use of computers as part of their professional education.

18. As long as we use the symbolic term "social" in our title we are making reference to human interaction in dyads, families, groups, at work, community, etc. Thus, computor tech may well help in these social interactive processes but it can only facilitate, it cannot replace. Of course we may decide the use of the term "social" is out of date; then, of course, we would not be social workers.

19. Unquestionably computers imply a tremendous change in the way we operate in society and still is in its early development. I welcome the advent of computers as a potential efficient and effective medium, although I have been slow in cautious in embracing them personally, I, however, can visualize their potential as a

meaningful tool in the helping process and communication process in general but doubt that it is any panacea for improving the quality of life as far as human happiness is concerned. As a tool for eradicating human drudgery and facilitating creativity and time management, I welcome it.

20. I don't have any more feelings about it than a hammer -- it is just a tool.

21. Computers mean nothing to me in and of themselves. What has meaning is the uses that people put the technology to. That is substantially a political matter. Like all technology, computers will be used to pursue/advance personal and group interests. Feeling wise, I am apprehensive of a continuing trend towards a gessellschaft society.

22. Useful for management of factual data. Useful for word processing. Continue to have reservation about clinical uses other than for discrete problem solving (i.e., for the learning disabled, etc.) Continue to find it somewhat intimidating and I have greater appreciation for need to have frequent usage in order for the time investment to be worthwhile. I simply forget operating instructions unless I use it a lot (word processing, for example).

23. Concerned re: overview; where are we going; why are we racing for more and more instead of asking why? Recognize benefits, e.g., save efficiency and money, but also causes negatives, e.g., unemployment.

24. Dear Hal. People want to blame you for so many of the world's woes. Why won't they accept that you are another piece of technology . . . like every other that has been invented. If you are abused rather than used, it will be because people chose to debase, demean and dehumanize one another, not because you willed something to happen. Take care, little one.

25. Computer technology represents a multifaceted challenge for me as a social work educator and practitioner. As moderately positive advocate of its development, I nonetheless am not personally very keen on developing my own skills. I feel similarly with most technology ranging from cuisinarts to VCRs to cars. Yet I appreciate the value of computer technology and resent some of my negative learning experiences with it. Thus, I need to find a middle route for myself personally. That is, be knowledgeable enough to facilitate its positive use in practice and social work education, yet not necessarily be very involved at a "hands-on" level.

26. The computer age is a fascinating mystery to me. I have had little need to use them except to search for library material and to conguate some statistics (the program couldn't do what I wanted it to do and I resorted to long-hand!!). I expect, however, that I will become more familiar with the technology and perhaps find it more useful.

27. Computers do have their place since it is inevitable that the computer age is upon us it makes more sense to make use of them if appropriate (within the home/office) and attempt to keep up with technological changes. Computers beyond their use for home finances, text editing, etc. can provide information through evaluation that can assist us within a work setting. However, it is still up to the individual to be able to properly assess/understand the material the computer provides and act upon it accordingly.

No Computer Literacy Rating Paragraph:

28. My feeling is that computers have an extremely limited (if any)role in clinical practice, and that we should spend less energy explaining why we don't use them and more energy improving the quality of human service delivery.

Summary

We have progressed through "Computer Attitude and Social Issue Questionnaire" sections two through five. Eight independent variables were examined for strength and direction of relationship with dependent variable aggregate scores in each questionnaire section, and then for a relationship with specific dependent variables of each test section. Pearsons Correlation Co-efficient was used to observe this relationship and results were organized and presented in tables.

Finally, the results of the qualitative paragraph requested in variable 98 were reproduced. These findings were intended to explore the three basic issues which technology presents as was revealed by the literature review in Chapter Two. These issues were summarized as 1) moral and ethical dilemmas; 2) implications of technological thinking and computer technology for social work; and 3) the state of readiness of social welfare educators to meet these challenges.

Even a peripheral glance at the results presented in this chapter reveals the meaning of Heidegger's view that the essence of technology is nothing technological (Heidegger, 1977). The dichotomy between the

two approaches to data collection, the quantitative and the qualitative, are compatible but extrapolate different kinds of information. We will discuss this difference in greater detail in Chapter Five.

# CHAPTER FIVE

## DISCUSSION AND IMPLICATIONS

The issues as presented by the literature review have been summarized as having to do with values and ethics, implications of technology and technological thinking, and the state of readiness of social welfare educators to effectively deal with these issues. The following discussion is primarily of the empirical data collected because that was the emphasis of this study. It must be questioned, however, if this information adequately deals with issues as presented by the literature review. Here we saw repeatedly, recognized authorities in mathematics (Russell, Whitehead), physics (Planck, Heisenberg) and computer science (Weiner, Weizenbaum) reinforcing the concept

> . . . that the mind thinks, not with data, but with ideas whose creation and elaboration cannot be reduced to a set of predictable rules (Roszak, 1986).

By using Likert scale questionnaires this study may have relied too heavily on the technological approach to establishing the reality experienced by respondents. The answers of respondents were controlled by defining the questions for them. Although this technological methodology is well suited to discover and control the world, it is not necessarily conducive to gaining insight into the world as it is experienced by individual respondents (Van Manen, 1984). In retrospect, it would seem this kind of personal insight would have been helpful in answering the issues posed by the literature review. More will be said on this issue of phenomenology when we later discuss the qualitative paragraph provided by respondents.

This work has examined attitudes and opinions of Faculty of Social Work instructors at The University of Calgary toward computer technology. Eight independent variables were established and these were examined for strength of correlation with 97 dependent variables. Statistical representations of these relationships were presented in tables in Chapter Four in the order of Computers and Computer Users, Value and Impact of Computers in Canadian Society, Concerns Regarding Computerization, and Computers in Social Work. Included within the latter were the contents of a qualitative paragraph which gave the value and meaning of computer technology for respondents in their own words. We will now discuss this information as it was presented in Chapter Three. The accepted $\underline{r} = .40$, $p = .05$ (Grinnell, 1981) will be considered a strong correlation in this study, with only those of $\underline{r} = .38$, $p. = .05$ or stronger being mentioned.

Computers and Computer Users

Table 4.1 shows Pearson Correlation Co-efficient for eight independent variables and aggregate scores from dependent variables 9 through 28. These questions were from the questionnaire "Opinions About Computers" (Gripton, 1984) and responses are represented in Table 4.1. Wording in this questionnaire dictates that as score is lower, respondents are deemed to hold positive opinions toward computer technology.

Table 4.1 reveals one strong correlation ($\underline{r} = .402$, $p = .014$) between using a computer at home and score on the questionnaire. This relationship means as respondents use a computer more frequently, they are more positively disposed toward computers.

Although this information suggests the computer tends to sell itself to users, the information does not tell us whether the conditions for positive disposition toward computers was present in users before they began to utilize the computer. It does tell us, however, that those who use a computer have not been turned against the machines. The information in Table 4.1 may be most helpful in that it shows no correlation between the other seven independent variables and as such tends to eliminate them from having an effect on the opinions about computers.

Table 4.1(a) shows results of Pearson Correlation Co-efficient between eight independent variables and dependent variables 9 to 40 from Computer Attitude and Social Issue Questionnaire used in this study. These variables include questions from "Opinions about Computers" (Gripton, 1984) as well as variables 29 to 40 from "Computers and Canadian Youth Project" (Kass & Kieran et al., 1986) questionnaire.

Independent variable age in Table 4.1(a) shows a relationship with three dependent variables. This means as respondents were older they do not believe computers dehumanize society (V17, $\underline{r} = -.392$, $p = .011$) and twice disagreed computers were a tool (V18, $\underline{r} = -.380$, $p = .013$) which is for the most part error free while humans make mistakes (V25, $\underline{r} = -.393$, $p = .011$) .

These relationships suggest as respondent were older they did not hold the computer responsible for the dehumanization of society although they do seem to think of the computer as different than a common tool. The uniqueness of the computer does not rest in its infallibility, however, because they tended to disagree it was error free. This opinion seems to rest on something other than familiarity with computers as no

strong correlations were observed between age and any of the other four independent variables regarding computer use.

Years of teaching on Table 4.1(a) shows that as years of teaching increased respondents were more likely to believe the computer wastes time and money (V15, $\underline{r}$ = .404, p = .011) because it cannot discriminate between large and small problems. This opinion appears to have no relationship with familiarity with computers as no strong correlations were noted between years of teaching and any of the other four independent variables dealing with computer use. This view may have an effect on respondent's view of computers in social work because the profession believes in the uniqueness of each individual and, as such, may be dedicated to discriminations between problems of all magnitudes.

"Have you ever used a computer?" on Table 4.1(a) shows a strong correlation with four variables. This means that as frequency of computer use increased respondents were more likely to agree computers increased the efficiency of an organization (V9, $\underline{r}$ = .518, p = .001) and that they were a tool (V18, $\underline{r}$ = .435, p = .006). Increasing frequency of use also shows a likelihood to agree that computers make mistakes at least 5 percent of the time (V22, $\underline{r}$ = .554, p = .000), but agreement with the belief that they improve the quality of life in Canada (V26, $\underline{r}$ = .449, p = .004).

Believing that computers increase the efficiency of an organization after using them frequently may reflect the dedication of users to the technology. As computers were used more frequently respondents tended to believe they were a tool which will improve the quality of life in Canada, presumably if used efficiently.

It is interesting that increased frequency of use found an increase in the belief that computers make mistakes 5 percent of the time because this shows the reluctance of users to embrace the machine as omnipotent.

"Do you consider yourself to be computer literate?" showed strong correlations with two dependent variables on Table 4.1(a). Those who rated themselves as not computer literate were more likely to disagree that computers dehumanize society by treating everyone like a number (V17, $\underline{r}$ = -.425, p = .008) and to disagree that computers make mistakes at least 5 percent of the time (V22, $\underline{r}$ = -.420, p = .009).

It would seem that if society is being dehumanized the group not computer literate believes it is due to something other than computers treating people as a number. One answer might be that this group has, by definition, tended to focus its energies in search of causes in areas other than computer technology, and so see the computer as a peripheral issue rather than a central cause. Although this group may be, for example, dedicated humanists, they may be vulnerable to the insidious influence of computer technology. This may be particularly so in view of their strong correlation in disagreeing that computers make mistakes at least 5 percent of the time.

"Do you use a computer in your home?" shows three strong correlations with dependent variables on Table 4.1(a). The more frequently respondents used a computer in their home the more likely they were to believe computers improved efficiency (V9, $\underline{r}$ = .590, p = .000) and to agree that computers make mistakes at least 5 percent of the time (V22, $\underline{r}$ = .591, p = .000). They were also more likely to believe computer operators make mistakes but computers were error free (V25, $\underline{r}$ = .403, p = .010).

It is understandable that those who take computers into their homes would believe in the machines' efficiency, but it is difficult to reconcile the two views that they make mistakes at least 5 percent of the time with the view that they are for the most part error free. Perhaps the key here is respondents who use a computer in their home tended to believe that a 95 percent accuracy rate is "for the most part, error free."

Use of Computers for work-related tasks was independent variable 8 and four correlations are recorded in Table 4.1(a). This information suggests as use of computer for work-related tasks increased the opinion strengthened that computers improve efficiency (V9, $\underline{r}$ = .518, p = .001), and improve quality of life (V26, $\underline{r}$ = .387, p = .013). As frequency of use for work-related tasks increased, so did agreement with computers making mistakes at least 5 percent of the time (V22, $\underline{r}$ = .477, p = .003) and the view women have as much ability as men to become computer experts (V31, $\underline{r}$ = .401, p = .010).

We see again the seemingly contradictory view of improved efficiency and belief that computers make mistakes at least 5 percent of the time. One might conclude that since the independent variable is computer use for work-related tasks, respondents feel that computer's contribution to efficiency of an organization greatly overshadows its 5 percent error rate.

The strong correlation of using a computer for work-related tasks with the belief that computers will improve the quality of life and with women having as much ability as men to become computer experts suggests that those who use them frequently find the computer is improving their quality of life. This tends to eliminate the view that computer work is necessarily dull and boring.

Value and Impact of Computers in Canadian Society

Table 4.2 shows Pearson Correlation Co-efficient for eight independent variables and aggregate scores in the test section entitled "Value and Impact of Computers in Canadian Society." One strong correlation ($r$ = .488, p = .003) is seen here and this suggests as respondents rated themselves as having used a computer more frequently they were more likely to view as favorable the value and impact of computers on society. Although not as strong, near relationships were noted between independent variables of using a computer for work-related tasks ($r$ = .361, p = .025) and for home use ($r$ = .347, p = .030).

This correlation does not show which came first, the positive disposition toward impact of computers in society or the frequent use of computers, but it does show that frequent use does not necessarily develop in users a negative attitude of their impact on society. Table 4.2 is also helpful in that it eliminates the other seven independent variables as being strongly correlated with the evaluation of impact of computers on society.

Table 4.2(a) shows correlations of eight independent variables with selected independent variables from this questionnaire section which achieved a relationship of $r$ = .38, or stronger.

Age shows a strong relationship with five dependent variables in Tables 3.2(a). These relationships suggest as respondents became older they would not feel comfortable using a computer for work (V44, $r$ = -.392, p = .011) and felt computers would not make the economic situation for women worse (V53, $r$ = -.473, p = .002). They tended to disagree with both statements that computers would have a negative effect on family life (V55, $r$ = -.510, p = .001) and that computers would

be important in their future work (V58, $\underline{r}$ = -.407, p = .008). As respondents were older they also tended to disagree that people would be in control of computers (V62, $\underline{r}$ = -.418, p = .007) and that computers would not affect chances for promotion (V63, $\underline{r}$ = -.455, p = .003).

The age correlation with these four employment issues that as respondents were older, they felt the impact of computers on their employment would be minimal. The similar correlation with a negative effect on family life would lead one to expect a correlation with agreement with people controlling computers, but as this is not the case, it seems the family will either be not effected or will be positively effected by computers.

Years of teaching in Table 4.2(a) shows one relationship suggesting as respondents recorded more years of teaching they did not agree that computers will make school children's training out of date (V61, $\underline{r}$ = -.432, p = .007).

This may show either a belief in the minimal impact of computers or that perhaps, as years of teaching increased, instructors placed more emphasis on human skills which are taught such as thinking and creativity.

"Have you ever used a computer?" in Table 4.2(a) shows relationships with five dependent variables. As respondents used a computer more frequently they felt more comfortable using a computer at work (V44, $\underline{r}$ = .446, p = .005) but felt computers would not be important in their future life (V46, $\underline{r}$ = .387, p = .013). As computer frequency of use increased respondents felt things done at present on computers were not important (V54, $\underline{r}$ = .624, p = .000) and would not be important in

future work (V58, $\underline{r}$ = .679, p = .000). Finally, as respondents rated themselves as using a computer more frequently they agree more computers were needed for a better life in their province (V59, $\underline{r}$ = .614, p = .000).

The strong correlation of frequency of computer use with feeling comfortable using a computer at work suggest use may be tied to work functions, such as word processing or data processing. That frequency of use correlated strongly with computers not being important in future life, and with things done at present or future not being important, suggests the computer is not the focus of attention in the life of respondents; they are not infatuated with it or with what it can do.

"Do you consider yourself to be computer literate?" in Table 4.2(a) shows strong correlations with four dependent variables. Those who were not computer literate were likely to feel uncomfortable if they ever had to use a computer in their work or career (V44, $\underline{r}$ = -.519, p = .001) but to disagree the things they do on a computer at present were unimportant to them (V54, $\underline{r}$ = -.422, p = .008). The group who were not computer literate tended to disagree that computers would be unimportant in their future work or job (V58, $\underline{r}$ = -.586, p = .000), and tended to believe more computers were needed to make life better in their province (V59, $\underline{r}$ = -.517, p = .001).

This independent variable shows a strong correlation with four dependent variables, all of which showed a strong correlation with the previous dependent variable of computer use. The shared relationship by the independent variables show the two groups have much in common as far as their views on these independent variables, and points to the

possibility of computer frequency of use and computer literacy being very similar as far as these dependent variables go.

"Do you use a computer in your home?" on Tables 3.2(a) shows three strong correlations with dependent variables. These relationships mean that as computer use in the home increased, respondents tended to agree that the things they do on a computer were not important to them (V54, $\underline{r}$ = .407, P = .009) and that computers would not be important in their future job (V58, $\underline{r}$ = .530, p = .001). As computer use increased in the home respondents were also more likely to feel more computers were needed in the future to make things better for their province (V59, $\underline{r}$ = .414, p = .008).

These three dependent variables also had strong correlations with the previous two independent variables of "Have you ever used a computer?" and "Do you consider yourself to be computer literate?".

"Do you use a computer for work-related tasks?" on Table 4.2(a) shows five strong relationships with dependent variables. This means that as respondents use a computer more frequently for work-related tasks they tend to feel more comfortable if required to use a computer for career work (V44, $\underline{r}$ = .489, p = .002) and to agree that things they do on computers at present are unimportant (V54, $\underline{r}$ = .611, p = .000). The higher the rating for frequency of using a computer for work-related tasks, the more likely respondents were to agree that computers would not be important in their future work (V58, $\underline{r}$ = .710, p = .000) and that more computers are needed to make life better in their province (V59, $\underline{r}$ = .570, p = .000).

This independent variable has strong correlations with the same four dependent variables as did "Have you ever used a computer?" and

"Do you consider yourself to be computer literate?" It correlates strongly with three dependent variables which also correlated strongly with "Do you use a computer in your home?"

Concerns Regarding Computerization

Table 4.3 shows there are no strong correlations between the eight independent variables and aggregate scores of dependent variables in Concerns Regarding Computerization.

Age in Table 4.3(a) shows two correlations with specific dependent variables from this questionnaire. This means that as age of respondents increased, the more likely they were to be concerned with the extensive use of English in computing causing French to become a less important language in Canada (V74, $\underline{r}$ = .439, p = .006). Similarly, as age increased the more likely respondents were to be concerned with unauthorized spread of personal information through computers (V82, $\underline{r}$ = .391, p = .011). It appears that the older the respondents became the more concerned they became with minority cultures and with personal privacy.

It was somewhat surprising there were not correlations between any of the independent variables regarding computers for this variable. Because of their increased knowledge and experience with computers this group may have been better informed as to the concerns of computerization.

Education in Table 4.3(a) shows one strong correlation (V84, $\underline{r}$ = -.459, p = .005). This means as advanced education of respondents increased they were less likely to be concerned that ordinary people are helpless when computer systems break down. This relationship may be

due to confidence in the resourcefulness of humans or perhaps the group under emphasizes the importance of computers.

Years of teaching shows one strong correlation (V66, $\underline{r}$ = .391, p = .013). This means as years of teaching increased respondents tended to be concerned with computers replacing people in many areas of work. It is likely a statistical tautology is occuring here because of the high correlation between years of teaching and age ($\underline{r}$ = .655, p = .000).

"Do you consider yourself to be computer literate?" shows one strong correlation (V84, $\underline{r}$ = .464, p = .005). This means that respondents who were not computer literate tended to be concerned that ordinary people are helpless when computer systems break down. It will be recalled there was also a strong correlation of this dependent variable with education. This correlation suggests the group who is not computer literate may not be aware of alternative approaches to the work the computer does and so may estimate its importance as greater than those who do understand them.

Computers in Social Work

Tables 4.4 shows no strong correlations between the eight independent variables and aggregate scores of "Computers in Social Work" questionnaire section.

Gender on Table 4.4(a) shows one strong correlation and this means female respondents tended to disagree that clients in counselling situations prefer computer assessment (V96, $\underline{r}$ = -.398, p = .013).

As this is contrary to the literature reviewed, the opinion may be explained by Rubin's theory of different socialization processes between

the sexes. Males are thing-orientated and trust machines while females are people-orientated and tend to distrust machines (Tinnell, 1985).

Years of teaching in Table 4.4(a) also showed a strong correlation with the view that clients in counselling situations prefer computer assessments. As years of teaching grew, the more likely respondents were to agree with this statement (V96, $\underline{r}$ = .550, p = .001).

Part of this correlation may be explained by the relationship between independent variable gender and years teaching ($\underline{r}$ = -.354, p = .024). This means female respondents tended to have fewer years teaching. Males have more years teaching, and this may be what accounts for this correlation.

The Qualitative Response

It is here we tend to learn what computer technology means to respondents. As opposed to the previous quesionnaire sections establishing whether or how often something happened, or how it correlates with another condition, here we have an opportunity to get at the nature of the experience of computer technology (Van Manen, 1984). Unfortunately, this study emphasized the technological model borrowed from the physical sciences, and it overshadowed phenomenological methods of establishing the essence and meaning (Van Hesteren, 1986) of computer technology to respondents.

Two examples from my personal contacts with participants in this research will help to illustrate the contribution possible through employing phenomenological research techniques. I was told of an incident which brought the implications of computer technology to a very personal level for one respondent. This person had a close friend who

had been involved in a peaceful demonstration in Canada against a government of a country located on another continent. That person later attempted to enter a country close to the one he protested against, but was turned back at the border because of his part in the demonstration in Canada. It was not the country he was demonstrating against who turned him away but, a sympathetic neighbor. His name had been placed on a computer record of undesireables without his knowledge and so could not enter as he wished.

A second example may help illustrate the phenomenological approach as appropriate methodology for this type of research. As discussion ensued around applications of computer technology by psychology and psychiatry one respondent initially thought it unlikely that clients would prefer computer assessments to human assessments. Upon reflection, however, the respondent speculated this truth may be more a comment on psychology and psychiatry than on computer technology.

These two examples suggest the potential for phenomenological research to construct a possible interpretation of the nature of these human experiences. The constructs would, I now believe, contribute a great deal to understanding the issues raised in Chapter Two, and summarized as ethical and moral issues, implications of technology and technological thinking for social work, and the stance taken by social welfare educators on these issues.

Question number 98 asked respondents to "Write a paragraph giving the meaning and feeling that computer technology has for you." The responses to this request are reprinted in Chapter Four and will be discussed here in the order they appear in Chapter Four.

Fifteen respondents rated themselves as computer literate, twelve as not computer literate and one did not answer the question regarding computer literacy but did say a computer was used often for work-related tasks. Of those not responding to question 98, two were computer literate and four were not. Starting with computer literate group responses, paragraph 1 in Chapter Four reveals an awareness appreciation for the benefits of computers but also and awareness that they dictate what information and perceptions will be deemed significant and worthwhile. The computer does this by demanding information be given it in a manner which is most suitable to the machine, and this information may not be what is most important to human beings.

Similar to this view is paragraph 5 which also mentions the computer as promulgater of values which are destructive to human life, unbeknownst to the user.

That computers tended to be value neutral was expressed in paragraph 3 which said they have no attitudes. Paragraphs 6, 8, 11 and 14 seem to express a similar view, but emphasize that humans will have to make critical choices regarding the technology. These seem to include a concept that although computers are value neutral, they have enormous potential for human betterment or degradation, and it will be human beings who decide these issues.

Paragraphs 2, 4, 10, 12, 13 and 15 concentrate on the benefits of the technology while the author of paragraph 9 does not believe computers should replace human contact.

Turning to the responses provided by those who classified themselves as not being computer literate, paragraph 16 is against

computers in social work and seems to fear the technology will become an end in itself within the Faculty of Social Welfare.

Showing a recognition for the positives of the technology and concerns that it must not replace the human element were paragraphs 17, 18, 19. Closely related to these were paragraphs 21, 23, 24 and 27 which emphasize it remains a human responsibility to decide how to use the technology appropriately.

Valuing the computer as a problem-solving tool is mentioned paragraph 22, 25 and 26 while paragraph 20 seems to suggest the computer is a neutral tool.

Finally, paragraph 28 did not have a rating as to computer literacy but often used it for work related tasks. This response suggests computers have a limited role in clinical practice, but doesn't tell why.

These paragraphs point out that being computer literate does not mean a user has blinded himself to the potential danger of the technology. For example, paragraphs 1 and 5 expressed the concern that computers are creating cultures by defining how and what is perceived, and both respondents were computer literate. This sophisticated awareness of the insidious nature of the technology was not noted by the not computer literate group.

Other concerns seemed to be equally represented by both groups, with the computer literate group more frequently mentioning the values and choices involved with implementing computer technology, and the non-computer literate group addressing the similar concept more specifically with computers should not replace human interactions.

## Summary

From this discussion of information presented in Chapter Four, we may conclude the four independent variables of Gender, Age, Education, and Years Teaching do seem to have an effect on attitudes and social issues, but the effect is not clear in every case and may not simply be classified as being either for or against computers.

Likewise, the four independent variables of: Have you ever used a computer?, Do you consider yourself to be computer literate?, Do you use a computer in your home?, and Do you use a computer for work-related tasks? do not clearly present themselves as correlating strongly with being either for or against computers with every dependent variable. This information suggests those who are utilizing computers continue to think and make judgements about the technology, as do those who do not utilize the technology. Put another way, neither group has either accepted or rejected computer technology without question. From this information we cannot say why one group uses computers in spite of their misgivings toward the technology, or why others do not use the technology in spite of their positive view of it in certain situations. Such information may have been helpful in designing a computer program which would receive the cooperation and support of faculty members.

## Implications

It must be noted no strong correlations were noted between the eight independent variables and the two variables which addressed computers in education. The only independent variable nearing a strong correlation with dependent variable "Computers will improve education" was that of age (V19, $\underline{r} = -.343$, $p = .024$). This means as respondents

were older, they disagree computers would improve education. Actual scorings for this question were 13 strongly agreed, 12 slightly agreed, 7 had no opinion and only 2 strongly disagree, with a mean of 1.53.

The strongest correlation with dependent variable "Computers should be taught in social work education" (V97, $\underline{r}$ = .290, p = .051) was gender. In spite of this weak correlation scores were 19 strongly agree, 10 slightly agree, 2 with no opinion, 2 slightly disagreed and 2 strongly disagreed, with a mean of 1.735.

From this information we may conclude that although the majority of faculty instructors agreed computers will improve education and should be taught and discussed at the Bachelor level, these views are not correlated with any of the eight independent variables used in this study. This point is important because it suggests those who are computer literate are not the only ones who believe computer technology will improve education and should be taught in Schools of Social Work.

The issue which has not been addressed by this research is whether computers are effective enough to be entrusted with educating social work professionals. As the literature review revealed, some believe feelings and logic operate in different areas of the brain and to reach people, one must know which region of the brain to involve (Hall, 1984). We must do more research in establishing how effective the computer is in accessing and dealing with emotions through utilization of mathematics and logic.

Finally, we must establish the extent to which we are prepared to entrust education to machines. Artificial intelligence pioneer Joseph Weizenbaum has commented:

> To think that one can take a very wise teacher, for example, and by observing her, capture the essence of that person to any significant degree is simply absurd. I'd say people who have that ambition, people who think it is going to be that easy, are simply deluded (Rheingold, 1983).

And similarly, Nobel Prize winner David Suzuki writes:

> There are those who see in the computer a panacea for teachers which opens the possibility to teach children how to think through a series of problem-solving challenges. Nonsense. That is a human activity that demands human guidance and understanding. Nothing will ever replace the flexibility and originality of the human mind. No machine will ever duplicate a good teacher (Suzuki, 1987).

At least part of Suzuki's conclusion may be based on a premise similar to that which caused the Russians to abandon their efforts to utilize a computer for translating language. Here, the computer was deemed a failure in spite of its ability to analyze syntax and grammar. The computer could not:

> . . . establish the relationship of the linguistic code to the larger setting of the scientific field: the context in which each word, sentence, and paragraph was set (hall, 1984).

We may do well to at least occasionally contemplate the view of Heidegger who suggested the technological framework attempts to "enframe" all beings in a particular claim of either availability or sheer manipuability.

> The threat to man does not come in the first instance from the potentially lethal machines and apparatus of technology. The actual threat has already afflicted man in his essence. The rule of enframing threatens man with the possibility that it could be denied to him to enter into a more original revealing and hence, to experience the call of a more primal truth (Heidegger, 1977).

It is likely this type of understanding will require an approach other than that provided by a technological method of research as this

approach does not lend itself well to study the distinctively human experience (Van Hesteren, 1986). To understand technology, we must accept all human perceptions and experiences with it, not only those facilitated by technological methodology (Grant, 1969; Fromm, 1960). If we believe emotions are an important part of our being human (Harre, Clarke, & DeCarlo, 1985; Child, 1986; Fromm, DeMartino & Suzuki, 1960) they must be included in any investigation of the relationship between humans and computer technology. To break the enchantment with technology (Burch, 1984), we must use a methodology which is not technological. Perhaps this realization alone has made this study worthwhile.

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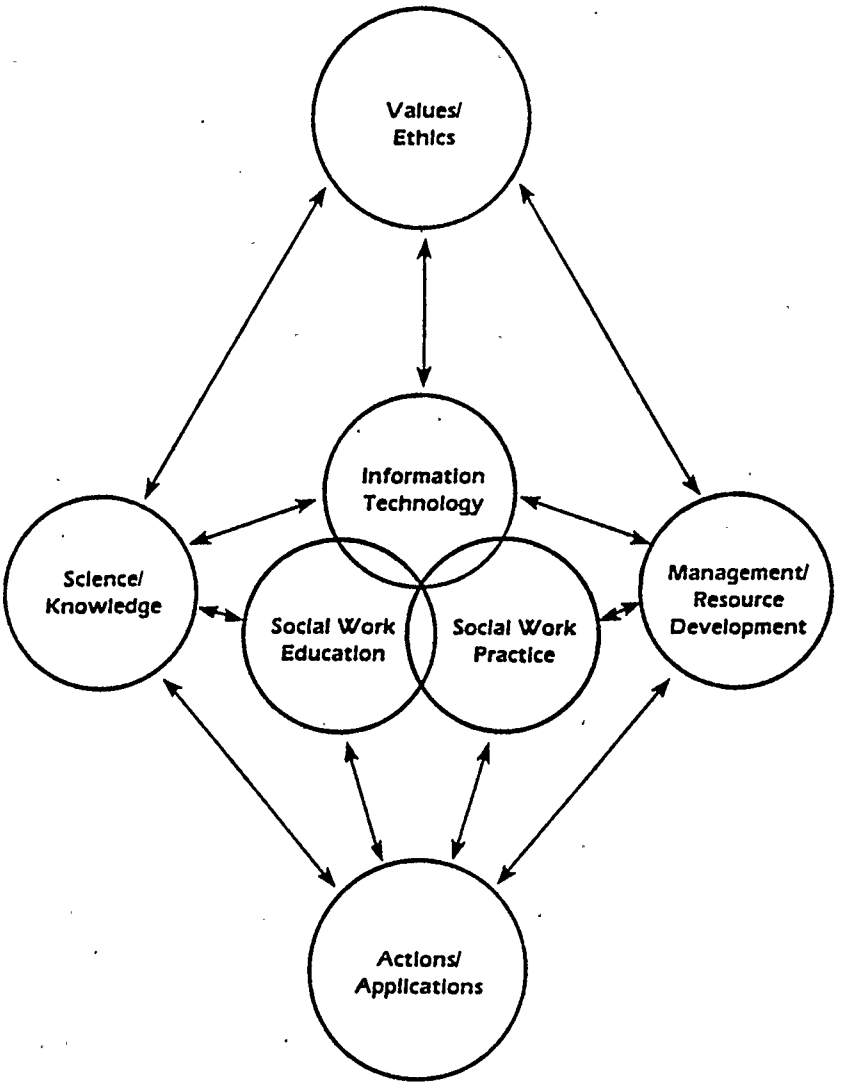
# APPENDICES

# APPENDIX A

## A FRAMEWORK FOR THE ANALYSIS OF INFORMATION TECHNOLOGY AND SOCIAL WORK PRACTICE AND EDUCATION




From: Geiss and Viswanathan. (1986). The Human Edge: Information Technology and Helping People, p.272.

# APPENDIX B

## CONSENT FORM

The following information is to be read to or by each of the study participants.

1. The researcher is an M.S.W. student studying at The University of Calgary, and this research is being undertaken as partial fulfillment toward that degree.

2. The purpose of this research is to establish opinions and attitudes of full-time Faculty of Social Welfare instructors at Calgary, Lethbridge, and Edmonton toward computer technology.

3. Participation in the research is voluntary, and no record is to be kept as to who participated and who did not, and participation requires approximately twenty minutes. Respondents are free to withdraw from the study at any time, even after agreeing to participate.

4. Anonymnity of respondents will be assured by data being used only in aggregate form, with original questionnaires being destroyed by the researcher upon study's completion. Data will not be broken down by program location.

5. Participants in the study are free to ask any questions they may wish regarding the study and expect that all such questions will be answered.

6. A summary of survey results may be obtained from the researcher upon request by participants.

7. The researcher is unaware of any risk involved to any who choose to respond to the instrument used in this study.

Thank you for your assistance.

# APPENDIX C

## COMPUTER ATTITUDE AND SOCIAL ISSUE QUESTIONNAIRE

The following survey is presented in sections of Demographics, Computers and Computer Users, Value and Impact of Computers in Canadian Society, Concerns Regarding Computerization, and Computers in Social Work. Please respond to the questions with your opinion, as best you can.

SECTION ONE: DEMOGRAPHICS

1. Sex: M _____ F _____

2. Age range: 20-25; 26-30; 31-35; 36-40; 41-45; 46-50; 51-55; 56-60; 60+

3. Education: _____

4. Years teaching: _____

5. Have you ever used a computer?

( ) not at all ( ) a little ( ) sometimes ( ) often

6. Do you consider yourself to be computer literate? Y _____ N _____

7. Do you use a computer in your home?

( ) not at all ( ) a little ( ) sometimes ( ) often

8. Do you use a computer for work-related tasks?

( ) not at all ( ) a little ( ) sometimes ( ) often

Questions 9 to 28 from "Opinions About Computers", Gripton, 1984.

Questions 29 to 88 from "Computers and Canadian Youth Project Student Questionnaire," Kass and Kieran et al., 1986.

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SECTION TWO: COMPUTERS AND COMPUTER USERS

The following statements give opinions that some people have about computers and computer users. Please indicate your opinion on these statements by marking on your answer sheet.

1 - strongly agree
2 - slightly agree
3 - no opinion
4 - slightly disagree
5 - strongly disagree

| | | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|---|
| 9. | A well organized computer system improves the overall efficiency of an organization. | 1 | 2 | 3 | 4 | 5 |
| 10. | The computer, because it can process and create so much data, has in fact complicated the world situation rather than simplified it. | 1 | 2 | 3 | 4 | 5 |
| 11. | The use of computers frees management from petty issues and thus enables them to concentrate more on real issues. | 1 | 2 | 3 | 4 | 5 |
| 12. | With a computer, the correction of errors is made more difficult. | 1 | 2 | 3 | 4 | 5 |
| 13. | A drawback of computer systems is that they depersonalize or dehumanize the work setting. | 1 | 2 | 3 | 4 | 5 |
| 14. | People who use computers become so carried away with what a computer can do that they lose sight of real problems. | 1 | 2 | 3 | 4 | 5 |
| 15. | Because the computer cannot easily discriminate between small and large problems, it spends time, and hence money, wastefully. | 1 | 2 | 3 | 4 | 5 |
| 16. | One of the major values of the computer is that it increases human efficiency. | 1 | 2 | 3 | 4 | 5 |
| 17. | Computers dehumanize society by treating everyone as a number. | 1 | 2 | 3 | 4 | 5 |
| 18. | Computers are a tool, just like a hammer or a lathe. | 1 | 2 | 3 | 4 | 5 |
| 19. | Computers will improve education. | 1 | 2 | 3 | 4 | 5 |
| 20. | Computers slow down and complicate simple business operations. | 1 | 2 | 3 | 4 | 5 |
| 21. | Computers will improve law enforcement. | 1 | 2 | 3 | 4 | 5 |
| 22. | Computers make mistakes at least 5 percent of the time. | 1 | 2 | 3 | 4 | 5 |

| | | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|---|
| 23. | Computers isolate people by preventing normal social interactions among people who use them. | 1 | 2 | 3 | 4 | 5 |
| 24. | Credit rating data stored on computers have prevented billions of dollars of fraud. This is a worthwhile use of computers. | 1 | 2 | 3 | 4 | 5 |
| 25. | Programmers and operators make mistakes, but computers, for the most part, are error free. | 1 | 2 | 3 | 4 | 5 |
| 26. | Overall, computers improve the quality of life in Canada. | 1 | 2 | 3 | 4 | 5 |
| 27. | Computers cause the general public more grief than benefit. | 1 | 2 | 3 | 4 | 5 |
| 28. | We have barely scratched the surface of the computer's potential. | 1 | 2 | 3 | 4 | 5 |
| 29. | People who are interested in arts are not the type of people who like computers. | 1 | 2 | 3 | 4 | 5 |
| 30. | Boys have more talent for computer games than girls have. | 1 | 2 | 3 | 4 | 5 |
| 31. | Women have just as much ability as men to become computer experts. | 1 | 2 | 3 | 4 | 5 |
| 32. | Extensive computer users are social misfits. | 1 | 2 | 3 | 4 | 5 |
| 33. | Computers are mainly for people who are good at math and science. | 1 | 2 | 3 | 4 | 5 |
| 34. | It is more appropriate for boys to play computer games than it is for girls. | 1 | 2 | 3 | 4 | 5 |
| 35. | You have to be very intelligent to be good at computers. | 1 | 2 | 3 | 4 | 5 |
| 36. | People who use computers are not very sensitive people. | 1 | 2 | 3 | 4 | 5 |
| 37. | It is more appropriate for girls to use a computer for word processing than it is for boys. | 1 | 2 | 3 | 4 | 5 |
| 38. | Girls have more talent for word processing than do boys. | 1 | 2 | 3 | 4 | 5 |
| 39. | Boys have more talent for programming than do girls. | 1 | 2 | 3 | 4 | 5 |
| 40. | Computer users have an unemotional view of life. | 1 | 2 | 3 | 4 | 5 |

SECTION THREE: VALUE AND IMPACT OF COMPUTERS IN CANADIAN SOCIETY

| | | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|---|
| 41. | Computer use can bring out human creativity and self-expression. | 1 | 2 | 3 | 4 | 5 |
| 42. | Because of communication by computers French-English relations in Canada will improve. | 1 | 2 | 3 | 4 | 5 |
| 43. | Personal choice and freedom in many areas of life are restricted by computers. | 1 | 2 | 3 | 4 | 5 |
| 44. | I will feel comfortable if I ever have to use a computer in my work or career. | 1 | 2 | 3 | 4 | 5 |
| 45. | Most jobs involving computers are dull and repetitious. | 1 | 2 | 3 | 4 | 5 |
| 46. | Computers will not be very important to me in my future life. | 1 | 2 | 3 | 4 | 5 |
| 47. | Computer art and music is of poorer quality than that produced by humans directly without computers. | 1 | 2 | 3 | 4 | 5 |
| 48. | Unauthorized copying of computer software should be illegal. | 1 | 2 | 3 | 4 | 5 |
| 49. | Computers will be important for Canadians in their future work and jobs. | 1 | 2 | 3 | 4 | 5 |
| 50. | Jobs that use computers have a higher status than jobs that don't use computers. | 1 | 2 | 3 | 4 | 5 |
| 51. | In general, if computers and computer output are used to help make decisions, human judgment will be improved. | 1 | 2 | 3 | 4 | 5 |
| 52. | Computers have raised the quality of life in my province. | 1 | 2 | 3 | 4 | 5 |
| 53. | Computers will make the overall economic situation for women worse. | 1 | 2 | 3 | 4 | 5 |
| 54. | In things I do at present computers are not important to me. | 1 | 2 | 3 | 4 | 5 |
| 55. | Computers have a negative effect on family life. | 1 | 2 | 3 | 4 | 5 |
| 56. | A national network of computers will strengthen Canadian unity. | 1 | 2 | 3 | 4 | 5 |
| 57. | In the future computers will give people in my province a better chance for a good life. | 1 | 2 | 3 | 4 | 5 |
| 58. | Computers will not be very important to me in my future work or job. | 1 | 2 | 3 | 4 | 5 |
| 59. | To make life better in my province in the future, more computers are needed. | 1 | 2 | 3 | 4 | 5 |

| | | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|---|
| 60. | Computers will make work easier for people in my province. | 1 | 2 | 3 | 4 | 5 |
| 61. | By the time school children finish training for a job, computers will probably make a lot of their training out-of-date. | 1 | 2 | 3 | 4 | 5 |
| 62. | In the future, people will be in control of computers, and not vice-versa. | 1 | 2 | 3 | 4 | 5 |
| 63. | The introduction of computers will mean fewer chances for promotion in the work force. | 1 | 2 | 3 | 4 | 5 |
| 64. | Computer technology will widen the gap between the wealthy and the poor in Canada. | 1 | 2 | 3 | 4 | 5 |

SECTION FOUR: CONCERNS REGARDING COMPUTERIZATION

Having and using a large number of computers in a community or country can raise many concerns; twelve are listed below. For each concern indicate if you ever talk about such matters with other people, and then indicate if it is of concern to you personally.

| | I talk about this with other people. | | This is a real concern for me. | |
|---|---|---|---|---|
| A. Computers will eventually replace people in many areas of work. | 65. | A. Yes<br>B. No | 66. | A. Yes<br>B. No |
| B. Some people can steal money and information from computer systems. | 67. | A. Yes<br>B. No | 68. | A. Yes<br>B. No |
| C. Computers will make it harder for ordinary people to find jobs. | 69. | A. Yes<br>B. No | 70. | A. Yes<br>B. No |
| D. Computers concentrate too much power in the hands of experts. | 71. | A. Yes<br>B. No | 72. | A. Yes<br>B. No |
| E. Because English is so widely used in computing, French will become a less important language in Canada. | 73. | A. Yes<br>B. No | 74. | A. Yes<br>B. No |
| F. Computers make it easy for people to spy or check up on other people. | 75. | A. Yes<br>B. No | 76. | A. Yes<br>B. No |
| G. Prolonged work on computers could be bad for a person's health. | 77. | A. Yes<br>B. No | 78. | A. Yes<br>B. No |
| H. Computers will widen the gap between groups that have wealth in Canada and those who do not. | 79. | A. Yes<br>B. No | 80. | A. Yes<br>B. No |
| I. Information about me can be circulated through computer systems without my knowing about it. | 81. | A. Yes<br>B. No | 82. | A. Yes<br>B. No |
| J. Ordinary people are helpless when computer systems break down. | 83. | A. Yes<br>B. No | 84. | A. Yes<br>B. No |
| K. Computers will force humans into lower-paying jobs. | 85. | A. Yes<br>B. No | 86. | A. Yes<br>B. No |
| L. Incorrect information stored in a computer could cause a lot of trouble for me. | 87. | A. Yes<br>B. No | 88. | A. Yes<br>B. No |

SECTION FIVE: COMPUTERS AND SOCIAL WORK

Please answer the following with either computer-assisted assessments or computer decision support systems for social workers in mind.

| | | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|---|
| 89. | Computers help people to understand themselves. | 1 | 2 | 3 | 4 | 5 |
| 90. | Computers do not help people to understand their problems. | 1 | 2 | 3 | 4 | 5 |
| 91. | Computers help counsellors to understand their clients. | 1 | 2 | 3 | 4 | 5 |
| 92. | Computers do not help counsellors to understand their client's problems. | 1 | 2 | 3 | 4 | 5 |
| 93. | Computers help to establish a plan of action to deal with human problems. | 1 | 2 | 3 | 4 | 5 |
| 94. | Computers do not help to evaluate the effectiveness of counselling. | 1 | 2 | 3 | 4 | 5 |
| 95. | Computers can help to make counselling more effective than non-computer assisted counselling. | 1 | 2 | 3 | 4 | 5 |
| 96. | Clients in counselling situations prefer computer assessments to human assessments. | 1 | 2 | 3 | 4 | 5 |
| 97. | Utilization of computers in human services should be taught and discussed with university B.S.W. students as part of their required course content. | 1 | 2 | 3 | 4 | 5 |

98. Please write a paragraph giving the meaning and feeling that computer technology has for you.

Title: _____

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(Use other side if necessary.)