Overview

Twenty years ago it was rare to find social workers using computers to help them implement clinical tasks. Social workers’ attitudes toward computers were generally unfavorable. Some scholars described their views as being cautious, suspicious, and even pre-technological (Tanyon, 1971 & Hedlund, 1974). Perhaps, there were legitimate reasons for social workers to be concerned about the permeation of computer-based information technology in the profession. They had limited documentation and knowledge with which to appropriately determine how this technology would affect the interpersonal interaction between themselves and clients.

As social workers enter the 1990s, their attitudes toward computers are changing. Since the mid-1980s, several studies have found that social workers are demonstrating slightly favorable to favorable attitudes toward the idea of using computer-based information systems in direct-care practice (Zysman, 1989; Perry 1986, & Lynch, 1985). This attitudinal shift is consistent with prevailing social attitudes of a modern-day technologically-oriented culture which depends on computers to gain rapid access to data and information to arrive at rationally-based decisions. This requires the decision-maker to become “aware of a problem, posit a goal, carefully weigh alternative means, and choose among them according to his estimates of their respective merit with reference to the state of affairs that he prefers” (Etzioni, 1967, p. 385). Computer technology, applied to the field of information management, has the capability of hastening the process of inputting, accessing, processing and displaying information rapidly so that decision-makers can have it available to them for decisions in a timely manner. This type of system is referred to as a computer-based information system.

Social workers’ changing attitudes toward computers are also consistent with the modernization of health care. Over the past twenty years, the health care delivery system has been increasingly computer-oriented, especially since the advent of expert systems. An expert system is a “computer program that has built into it the knowledge and capability that will allow it to operate at the expert’s level” (Felgenbaum and McCorduck, 1983, p. 64).

In medicine, expert systems are used for consultations about patient symptoms and diseases. Specifically, they assist physicians in arriving at diagnoses and formulating effective treatment strategies. One of the earliest computer generated consultation programs was developed by Bleich (1974). The program asked the treating physician about the patient’s symptoms, behavioral signs, values of laboratory tests, present medications taken and other clinically significant information.
Once this information was entered, the computer analyzed it and produced a differential diagnosis, recommendations for initial treatment and recommended strategies for future interventions, including suggestions for continued care and literature references. Mycin, Internist/Caduceus, CASNET, Puff and others are some of the expert systems used in medicine (Feigenbaum & McCorduck, 1982). The influx of these systems helped to expand the use of information technology into clinical tasks, whereas onetime they were primarily employed for administrative-type functions.

**Expert Systems Applied to Psychiatry/Psychology**

The fields of psychiatry and psychology have moved in a similar direction as medicine in adopting expert systems. The objectives of these systems were to offer practitioners' adjunctive devices to perform a host of clinical functions: diagnostic impressions, suggestions for intervention, matching patients with appropriate levels of care, discharge planning, information and referral services. Some of the expert systems that have been used in mental hygiene services have included: the Automated Minnesota Multiphasic Personality Inventory -MMPI; Computer Interaction of Schizophrenic Speech Patterns - SAM (Tickner & Jessee, 1980); the Psychiatric Assessment Unit - PAU (Johnson & Williams, 1980); and the Interactive Computer Programs with Agoraphobics (Carr & Ghosh, 1983). Studies have demonstrated that clients generally enjoy using these computers, and they provide practitioners with more clinically relevant information than what is generated in a face-to-face interview.

**Alcoholism/Substance Abuse Treatment:**

**Computer-Based Technology in Promoting the Disease Concept**

In recent years, there have been great efforts to refine alcoholism/substance abuse treatment. Part of this effort arose out of a growing awareness among medical and mental health practitioners that their professional training was inadequate in preparing them to treat alcoholics and substance abusers. Many experts in the alcoholism/substance abuse field generally agree that specific skills and knowledge are required to treat this population which is independent of social work, medicine, psychology and nursing (New York State Division of Alcohol and Alcohol Abuse Services, 1987). Recognizing this, professional organizations, such as the American Medical Association (AMA) and the Council for Social Work Education (CSWE), revised their academic curriculums to include courses that specifically trained practitioners to view alcoholism and substance abuse as a biopsychosocial disease and devise treatment strategies that were specifically suited for this condition. Furthermore, national public policies, such as the Hughes Act of 1971, supported the idea that alcoholism/substance abuse was a treatable disease. This implied that alcoholics and substance abusers needed to be seen in hospitals, outpatient clinics and rehabilitation facilities rather than be punished within the criminal justice system. Consequently, the act encouraged the development of new treatment programs and inspired researchers to experiment with innovative techniques, including information technology, to ultimately enhance the recovery process.

The emphasis on treatment by professional organizations, coupled with the support of public policies, were congruent with a cultural reconceptualization of the alcohol and substance abuser. Throughout most of American history, alcoholics were viewed as moral degenerates who were principally engaged in
illegal and antisocial acts (prostitution, juvenile delinquency, child abuse, violent crimes, etc.). This belief was inspired by the works of Dr. Benjamin Rush, a physician and pioneer of the Prohibitionist Movement. Rush defined alcoholism as a disease, but not in its current biopsychosocial terms. Instead, he conceptualized it as a disease of the will which was brought on by a "gradual breaking down of moral willpower" (Ames, 1985, p. 30). Dr. Rush and his supporters advocated the formation of public policies that imposed strict criminal penalties upon alcohol producers, distributors and consumers.

This view of alcoholics remained relatively unchallenged until the early 1940s when the Yale University Center for Alcoholism Studies (later moved to Rutgers University in the 1960s) was inaugurated. The center's first director, E.M. Jellinek, a noted alcoholism scholar, supported the concept that alcoholism was a progressive biopsychosocial disease which had distinct medical, psychological and social symptoms. This disease advanced in three stages: early, middle and late. Each stage represented an escalation in the individual's inability to control his/her ingestion of alcohol which, in turn, led to several physical, psychological and social impairments (Ames, 1985). The AMA adopted this disease concept of alcoholism in 1958 and the College of Physicians and Surgeons embraced it in 1969. The support of these and other organizations clearly established a change in the American cultural conception of alcoholism, favoring health care assistance rather than imprisonment for alcoholics. This suggested that alcoholics ought to be reengaged and not isolated from the mainstream of American society.

The recognition of alcohol, and later substance abuse, as a biopsychosocial disease prompted many professionals to enter this field of practice. As a result, they modified conventional diagnostic and treatment approaches. Traditionally, alcohol treatment adhered to a self-help model, recovering alcoholics helping newly recovering alcoholics maintain sobriety, such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA). But as physicians, social workers, psychologists and others began treating alcoholics, new techniques were introduced to complement the self-help approach. For instance, they introduced individual, group and family therapy, along with a host of medical and nutritional interventions (Ewing & Rouse, 1977; Pattison, 1979; Davidson & Bremser, 1981). The alcoholic and substance abuser were now treated within a biopsychosocial framework which meant that in addition to the individual’s goal to maintain abstinence from alcohol/drugs, his/her work behaviors, social relationships, medical condition and other characteristics were also evaluated. If dysfunctions were discovered, they became incorporated into the overall treatment plan. This multifaceted treatment program evidently compelled practitioners to be highly concerned about coordinating information among themselves to ensure that clients were receiving appropriate care.

Role of Information Technology

The application of computer-based information systems were commensurate with new developments occurring within the alcohol/substance abuse field. In fact, these systems were seen as instruments that could potentially mitigate some of the problems faced by practitioners in delivering multidisciplinary-oriented treatment. However, few studies were available which sufficiently demonstrated the benefits and liabilities of bridging the fields of information technology and
alcohol/substance abuse care. But those that were available revealed some interesting findings.

For instance, Altman et al. (1978) devised the Missouri Actuarial Report Systems (MARS). Mars is a diagnostic system which produced clinical prediction scores specifically for alcohol and substance abuse patients entering hospital emergency rooms. They found that psychiatrists were able to evaluate the need for hospitalization more effectively with the computer generated information than through direct face-to-face interviews. The implication of this finding is significant when considering the importance of matching clients with appropriate levels of care and reduce health care costs by eliminating unjustified admissions into hospitals.

Lucas, Luna & McInroey (1977) used a computer assisted interview that was designed to elicit data and information about a patient’s alcohol consumption and behavior. They found that clients reported significantly greater amounts of information to the computer-administered questionnaire than to psychiatrists who interviewed them directly. Automated interviewing techniques may be especially helpful when clients are sensitive and anxious in revealing information about themselves in the early phases of treatment.

Other applications of computer-based technology in diagnosing and treating patients include the Automated McAndrew’s Sub-scale of the MMPI; Tovem & Zohn’s (1982) Computerized Treatment Planning System; Alfonso’s et al. (1984) Automatic Referral System; Berson and Bellack’s (1976) Aftercare Planning System and the New York State Changing Treatment Center Project (1987). In all, these systems were designed to help practitioners gain access to clinically relevant information to enhance clinical judgements and decisions.

Recently, computer programs have been designed for clients to be used at home. Scott (1988) reports that alcoholics/substance abusers and their families are accessing their personal computers into nationally-based electronic mail and computer bulletin board communication systems. They are transmitting information with a modem from their personal computers through standard telephone lines which is then received by a computer in a different area and displayed to another individual. This process enables clients to obtain information about alcohol and drugs, a listing of AA and NA meetings in their local areas or in areas where they are planning to travel, maintain communication with AA and NA sponsors at times when they are unable to attend meetings due to illness, work and family commitments. The growth of this and similar types of technology is encouraging for the future, particularly since health care policies are promoting the concept of home-care. Computer-based information and communication systems technology, aptly applied, can offer extraordinary opportunities in accessing professional services to home-bound clients.

Professional Dilemma

Although computer-based information and communication systems can benefit practice, social workers have generally been prudent in utilizing these systems in their work with clients. Information and communications technology will continue to permeate into the health care delivery system in ensuing years. Some scholars are urging social workers to seize this opportunity and to borrow from the technology those attributes that can enhance the profession, as well as upgrade the quality of services delivered to clients. In doing so, they
can exert influence upon the future development of this technology to ensure that it is responsive to the needs of the practice community (Geiss & Viswanathan, 1986). Others argue that social workers must move gradually on this issue because the overall effects of computers in respect to practice is relatively unknown.

The dilemma for social workers center around two key issues: 1) they must determine whether computerization will in fact enhance the quality of services offered to clients; 2) whether the profession can continue to delay decisions relating to computers before they find themselves falling too far behind the advances of the contemporary technological culture and consequently lose touch with prevailing social issues.

Most educators and practitioners agree that the use of computer technology for practice must be examined seriously by social workers in the near future. But the process has to be pursued carefully and thoughtfully to prevent from endangering the basic values and mission of the profession, the human therapeutic relationship between the practitioner and client (Palombo, 1986).

Christensen (1986), a philosopher in the human services, suggests that social workers' dilemma with computers could be resolved through a deontological approach (weighing the positive and negative aspects of a decision). Specifically, she recommends asking and responding to five basic philosophical questions:

1) What make acts right?
2) To whom is moral duty owed?
3) What kinds of acts are right?
4) How do rules apply to specific situations?
5) What ought to be done in specific situations?
(p. 77).

Christensen favors the idea that information and communications technology can be beneficial to social workers in direct care practice. She warns, however, that this technology should not be used at the expense of compromising or violating the basic duties and moral obligations that social workers have to themselves and their clients.

Highlights of a Study

Zysman's (1989) descriptive study examined alcohol/substance abuse practitioners' attitudes toward utilizing computer-based information and communication systems in practice. This study investigated whether individual characteristics, such as education, professional training, treatment philosophy and other variables, were associated to attitudes. It also investigated the notion of whether social workers and other mental hygiene practitioners are indeed against the idea of using computers to assist them in their work with clients. As discussed earlier, the issue of employing computers in practice is sensitive since it raises many concerns in respect to professional values and ethics. Thus, it requires the profession to examine it closely before definitive decisions are made in respect to adopting this technology in clinical contexts.

Alcohol and substance abuse practitioners were selected for three reasons. First, the issue of alcoholism/substance abuse is considered one of the major public health problems in the eighties. Second, the field is highly interdisciplinary
given the influx of professionals from the fields of social work, psychiatry, psychology, nursing etc. This requires practitioners to coordinate information effectively in order to deliver quality services. Third, the issue is historically relevant, particularly since computer systems (including expert systems) are being introduced specifically for alcohol/substance abuse treatment and for health care in general.

Conceptual Framework

Rogers & Shoemaker’s (1971) diffusion of innovation theory was used in this study. This theory is concerned with the formation of new ideas and how they permeate from creators to adopters. It is appropriate for this study because its central focus was on innovation, i.e. the prospective employment of computers by practitioners in treating alcohol/substance abusers. Furthermore, the theory is concerned with what variables are associated with the successful introduction of a new technology (Schoech, 1982, p. 128).

Rogers and Shoemaker devised a 4 stage model which depicts the process of innovation from the perspective of how an individual accepts or rejects a new idea, approach or object. The model is described as follows:

1) Knowledge Function Stage: The individual initially becomes aware of the innovation and obtains some information and understanding of its functions.

2) The Persuasion/Attitudes Formation Stage: The individual adopts a favorable or unfavorable attitude toward the innovation which can lead him/her to eventually adopt or reject it.

3) Decision-Making Stage: The individual either adopts or rejects the innovation.

4) Evaluation Stage: The individual assesses his/her decision regarding the adoption or rejection of the innovation (Roger & Shoemaker, 1971, p. 2).

Rogers and Shoemaker’s model clearly demonstrates that the adoption of innovation occurs in stages and its development is incremental. The first two steps of the model reflect a pre-decision phase, while the latter steps reflect a decision and a post-decision phase in respect to innovation. It was assumed in this study that most alcohol/substance abuse practitioners have not made the decision to utilize computers in practice at this time, thus, it was appropriate to place them in the second stage (attitude formation stage) of Rogers and Shoemaker’s model. It was evidently important to investigate their attitudes to gain more insight into why they have not yet decided to utilize computers for practice in light of its widespread usage in contemporary society.

Key Variables

Attitude was the dependent variable. It was defined as the combination of the practitioner’s (1) affect for or against computer-based information systems, (2) an expression of favorableness or unfavorableness toward computer-based information systems and (3) indicator of potential behavior
toward adopting or rejecting computer-based information/communication systems into clinical practice.

Eight independent variables were tested:

1) The practitioners' level of academic experience (Education variable).
2) Level of professional training (Skills development variable).
3) Years of professional experience (length of time in practice variable).
4) Individual's Treatment Philosophy and Orientation.
5) Familiarity (previous exposure/experience) with computers.
6) Practitioners perception of whether currently used motivation/communication Systems were adequate or inadequate in arriving at clinical decisions (Adequacy variable).
7) The organization's climate (Characteristics atmosphere and values of the organization toward innovation).
8) The organization's philosophy of treatment (approach or orientation) to determine whether computer-based information systems are compatible to the needs of the organization.

Measurement Instrument

The Zyman Innovative Information System Practitioners Attitude Scale (ZIISPAS), a self-administered questionnaire, was constructed to measure the key variable in the study. It was necessary to devise an instrument because a review of the literature indicated that there were no preexisting scales available to measure the variables that were important to this study, as well as adequately addressed the issues that were specifically related to the work of alcohol/substance abuse practitioners.

ZIISPAS consisted of six subscales: 1) Decision/ Information Scale (DIS/INF); 2) Information System Scale (INS); 3) Information Attitude Scale (ISAS); 4) Communication Attitude Scale (CSAS); 5) The organizational Scale (OC) and 6) Descriptive Scale which gathered data and information and practitioners background, such as years of experience, age, academic degree, etc. ZIISPAS had a total of 167 items.

Validity

Five clinical experts in the alcohol/substance abuse field used the face/content approach to determine the validity of ZIISPAS. The group consisted of two psychiatrists, two social workers and one clinical psychologist. The experts all had at least eight years of professional experience in treating alcohol/substance abuse clients and held a license in their respective fields. The experts concluded that ZIISPAS was a highly valid instrument.
Reliability

ZIISPAS was distributed to a reliability group consisting of 16 practitioners: eight certified social workers, two Ph.D.-level psychologists, one psychiatrist, and five certified alcoholism counselors. The scores were then calculated by the Cronbach Alpha method. This is used to calculate the reliability Alpha Coefficient of interitem correlations. The Alpha Score obtained from the 16 subjects was .8115 (Excellent Alpha reliability Score).

Sample

Once ZIISPAS was determined to be both valid and reliable, it was distributed to 250 alcohol and substance abuse practitioners. The researcher visited 20 accredited alcohol/substance abuse agencies in the New York Metropolitan region. Practitioners completed ZIISPAS during the time usually allotted for weekly staff meetings. Most practitioners completed the questionnaire in approximately forty-five minutes. Within a ten week period, 110 questionnaires were completed out of the 250 that were distributed (44% return). Practitioners who responded represented various professional disciplines, although over half of the sample population were social workers. Specifically, they consisted of: 3 Psychiatrists, 2 Ph.D.-Level Psychologists, 1 Doctoral Level Social Worker, 58 Master Level Social Workers, 6 Master’s Level Counselors and 31 Bachelor Level Counselors.

Summary of Results

The Kruskal-Wallis and Anova tests were used to calculate the statistical significance for the hypotheses investigated. The Kruskal-Wallis was employed to calculate ordinal level data, and Anova was used to evaluate interval level data. The tests revealed that there were statistically significant differences to attitude vis à vis two independent variables at the 0.05 alpha level: years of professional experience and Practitioner’s perception of adequacy. Practitioners who had 5 or more years of professional experience were found to be more amiable to the idea of using computer-based information and communications systems in practice than those practitioners with less than five years of experience. Furthermore, practitioners who perceived their present information systems to be inadequate or uncertain as to whether those systems were serving them adequately were more amiable to the notion of using computer-based communication systems than those who found their present systems to be adequate. The remaining six independent variables were found to be statistically insignificant with regard to attitudes toward using computer-based information and communication systems.

The fact that there were only two significant findings does not necessarily indicate that the other variables were unassociated with attitude. It is important to recognize that measurement and/or sampling error may have contributed to the results revealed. Nevertheless, the two significant results that were found add interesting insights into understanding practitioners’ attitudes. It demonstrated that experienced practitioners are not conservative in their attitudes toward computers and innovation in general. This challenges the notion that experienced practitioners are resistant to change because
they are comfortable with traditional practice techniques. But as practitioners are exposed to clients over time, they become more aware of their clients' needs and are better able to evaluate how current methods are addressing those interests. This awareness can incite change and place the experienced practitioner in the forefront of the innovation process. The results moreover revealed that practitioners' perception of adequacy was associated to attitude. This conclusion is logical. Certainly, those practitioners that are satisfied with current methods will be less apt to change traditional practices than those who are unsatisfied or those who are uncertain that current techniques are meeting their needs. This is also consistent with Rogers & Shoemaker's conceptual framework which suggests that awareness of a problem is the first step of the innovation process.

Overall, a descriptive analysis of the subjects revealed that they were between a neutral and slightly positive position in respect to using computers in practice, i.e., measured on the basis of a 7 point Lickert-type scale. This indicates that they were not strongly unfavorable or favorable to the idea of utilizing these systems at the present time.

Implications for Practice

The study suggests that social work practitioners, at least those who were surveyed in the alcoholism and substance abuse field, have neutral to slightly positive attitudes toward the idea of using these systems in practice. Their reservations may be better understood from the arguments expressed by Palombo (1986) and Levitan & Willis (1985).

Palombo (1986), a social work practitioner, expressed caution in moving forward on this issue. He recognized that there are benefits that can be gained from the use of this technology. But since this technology is relatively new in respect to social work, its long-term implications upon the therapeutic relationship are uncertain. Recent media exposure of computer viruses and other forms of software tampering heighten these concerns which warrant a prudent, unzealous attitude, on the part of practitioners in response to employing these systems in clinical contexts. On the basis of these recent reports, it is realistic to consider the idea that unscrupulous individuals can enter into an agency's mainframe and personal computer systems to gain access to confidential client records. Furthermore, it reinforces the notion that software programs can be manipulated to produce erroneous information, leading to inappropriate diagnostic assessments and treatment decisions. The overall effects of computer-based technology on social work evidently requires further research.

Practitioners do not tend to perceive computer-based systems negatively. There is a basic awareness that computer-based information systems will ultimately replace existing manual systems. Practitioners are aware that manual systems are limited in their capacity to store, process, manipulate and display vast amounts of information. However, it is clear that computerized systems can perform these functions rapidly and efficiently.

Levitan & Willis (1985) found that practitioners' lack of knowledge in respect to computers, not their unwillingness to experiment with them, was one of the key factors delaying practitioners' decision to use computer technology. Once adequate training is achieved, practitioners will be able to
utilize the technology more comfortably since some anxieties and fears will be alleviated (Schneidemann, 1979). As systems are designed more specifically to the needs of practitioners, there will be a greater tendency to use them.

The critical question is how to progress? This study found that experienced professionals are leaning in a favorable direction in respect to using these systems in direct-care services. This implies that practitioners could act as catalysts in bridging the field of information technology with social work. For instance, their knowledge and experience in social work can be used in working with computer experts to devise training programs which specifically address the needs and concerns of the direct-service community. They can also be helpful in advising experts to design computer systems, with appropriate hardware and software, for practice which can:

1. Match clients with appropriate levels of treatment.
2. Formulate individualized multivariate assessments which evaluate a client's individual, social, vocational medical and family levels of functioning.
3. Recommend treatment strategies in addressing individual dysfunctions.
4. Gather information about community resources for referral.
5. Access references to new studies.
6. Establish security systems which preserve the confidentiality of client data and information.

**Summary**

Computer-based technology has become an intrinsic part of modern-day western culture. Its impact on society will not diminish, but grow to unprecedented proportions, particularly as the 21st century approaches. The diffusion of this technology is already evident in the health care delivery system, and health care practitioners are becoming more dependent upon it to make crucial decisions related to clients.

Despite the ever-growing presence of computers in present day society, alcohol/substance abuse practitioners, are not yet fully committed to using these systems in practice. Perhaps this is attributed to a lack of knowledge of how these systems can be applied to help them in their work with clients. It is, therefore, not necessarily connected to practitioners’ feelings that these systems are inherently incompatible with the nature of their work.

The findings of the study were enlightening. It demonstrated that innovation is an incremental process and it would be premature to expect practitioners to adopt computers in practice at this particular time, especially since they lack the knowledge, and studies have not definitively indicated that these systems can enhance the client-therapist relationship. From Roger’s and Shoemaker’s perspective, practitioners are in the second phase of the innovation process, the attitudinal stage.

It also found that experienced Practitioners (those with five or more years of practice) were amenable to using computer
systems than less experienced colleagues (those with less than five years of experience). This is logically sound since experienced practitioners are able to detect deficiencies in practice and this awareness can help to promote new directions for practice. In essence, they can be the catalysts in inciting change within the profession and assume leadership roles in making information technology responsive to the needs of the practitioner.

Lastly, the study revealed that those who found present information and communication systems to be adequate were less apt to utilizing computers than those who perceived their current systems to be inadequate or were uncertain about it. This is congruent with the Roger's and Shoemaker framework of innovation. They assert that innovation is initiated and supported by those who recognize that a problem exists.

Practitioners are not standing idle to the issue of computers. They realize that it can provide them extraordinary opportunities in enhancing the quality of services that can be offered to clients. But they also recognize that computers cannot be applied into practice without carefully examining the ultimate effects it would have on the profession’s values and basic mission, the therapeutic relationship between their clients and themselves.
REFERENCES


