

THE USES AND BENEFITS OF THE MICROCOMPUTER
IN OCCUPATIONAL THERAPY PRACTICE

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Chapter I

Introduction

Computers are presently causing a revolutionary change in the American way of life. They evolved from scientific study for the advancement of the military. Since the advent of their commercial use around the early seventies, microcomputers have infiltrated almost every aspect of life (Langford & Fidler, 1984). Within this short period of time, computers have been purchased by such institutions as medical facilities and educational institutions (Baum, 1983; McLeod, 1983). Other forms of technology such as telecommunications, speech, graphics, and video discs are predicted to become more prevalent (Langford & Fidler, 1984).

How has the advent of high technology affected the field of occupational therapy? How can the practicing occupational therapist maximize the uses and benefits of this new electronic device? This study examined these questions that appear to be of vital concern among occupational therapists.

A review of the studies concerned with application of the computer in occupational therapy practice revealed limited actual uses of this new technology. Hightower-Vandamm (1981) reported that there is "no room for stagnation" (p. 834). The health care industry as a whole, and occupational therapy specifically, are involved in this

revolutionary change. Due to increasing health care charges, external pressures to monitor cost have become even greater. The federal government has become a major payer for services in medical facilities and has recently changed the manner in which funds are paid for services rendered to Medicaid and Medicare recipients. Block funds are now dispensed at the beginning of the fiscal year based on the annual projections made by the contractors of such services. Because of this technique pressure is put on medical facilities to become more accountable for their services. Consequently, practicing clinicians are charged with meeting the challenge of marketing the services of occupational therapy to survive (Baum, 1983).

Hightower-Vandamm (1980) characterized marketing as the examination, promotion, pricing, advertising and re-evaluation of service so that it remains saleable. She also acknowledged that for occupational therapy to be able to compete with other services such as recreation therapy and activity therapy, cost containment was going to be a major factor. The profession has entered an age of accountability for the output of services. Occupational therapists are now being examined as to the effectiveness of practice. If the profession does not measure up to being a vital part of the health care industry the service will be terminated.

Scott (1984) foresaw the use of computer technology in meeting the challenge of accountability and documentation. Not only can microcomputers be used in this way, but they also offer an alternative approach to treatment (i.e. building eye-hand coordination, leisure

time pursuits, visual tracking skills) (Baum, 1983).

English (1975) reported on a general fear of the use of computers. Many consider the computer to be impersonal. There is great concern about invasion of personal privacy; but with some basic knowledge of the functional uses of the computer and its application to the profession of occupational therapy such fears could diminish (English, 1975).

Studies have found that practicing clinicians reach supervisory responsibilities within two years after graduation, and fewer than fifteen percent of current occupational therapists possess graduate degrees in any field (Fike, 1983). Fike reported on the high degree of inadequacy perceived by occupational therapy managers. A survey was conducted by Fike (1983) in the Houston, Texas, area to identify therapists' perception of their entry-level preparation for management tasks. Of seventeen respondents, only three felt prepared to coordinate the work of others; only one admitted skill in supervising the staff for better work performance; and only two indicated an ability to conduct staff development. The Ad Hoc Committee on Administrative Issues ("Final Report", 1980) also used a survey to find that occupational therapy managers are weak in personnel evaluation, development and planning, reimbursement strategy, and budget planning. Such data reflect the present state of occupational therapy administrators' feelings of incompetency.

Statement of Problem

Because of the impact the computer has made on the health care

industry and noted lack of research on this topic in the field of occupational therapy, the need to be in harmony with the changing times should be of significant importance to the practicing therapist.

Statement of Purpose

A descriptive survey was used to identify the uses and benefits of the microcomputer to the practice of occupational therapy. The specific purposes of the study were:

- 1) To determine current specific uses of the microcomputer in the areas of administration and treatment by practicing clinicians.
- 2) To identify the potential advantages of using the microcomputer in administrative and therapeutic tasks for occupational therapy practice.

Definitions

Some of the more pertinent terms are defined for the benefit of the reader. They are as follows:

- 1) Administration. The highest decision-making level of an organization. The philosophy and over-arching goals of the organization are determined at this level.
- 2) Microcomputer. A small electronic device which receives data, manipulates it, and communicates it faster and more accurately than a human being.
- 3) Occupational Therapy. "The art and science of directing man's participation in selected tasks to restore, reinforce and enhance performance, facilitate learning of those skills and functions

essential for adaptation and productivity..." (AOTA Task Force on Social Issues, 1972, p. 204).

4) Treatment. The process of planning, implementing, and evaluating efforts utilized in counteracting a medical disorder.

Assumptions

The major assumptions for this paper were as follows: 1) occupational therapists have experienced the increased uses of the computer in other fields such as the business industry (i.e. banking, utility companies, airline travel, home computing, library computer searches, telephone operator assistance, etc.); 2) benefits do exist in the use of microcomputers; and 3) the uses and benefits of such an electronic device could be identified by the use of a descriptive survey approach.

Limitations

This study was limited by the geographical area studied by the researcher (the Dallas - Ft. Worth metropolitan area).

Chapter II

Review of Literature

Introduction

The literature was examined to determine the applications of the microcomputer by occupational therapists and persons in related fields and to identify the advantages of use of such a tool by the health care community entering an age of high technology. Research exemplifying the uses of the microcomputer in the field of occupational therapy was noted to be limited. The review of literature includes areas that are related to administration, marketing, computer-assisted instructional use, and treatment. The following review of related literature includes: a) historical perspectives, b) present state of the art, c) identified uses and benefits of the microcomputer by related fields, and finally d) the uses and benefits of the device by the profession of occupational therapy.

Historical Perspectives

The past decade has had major social changes that have significantly affected occupational therapy as a profession. Practicing clinicians during the seventies were observed to be functioning primarily in health care facilities - acute and chronic settings. Therapy was provided on a direct service basis. This pattern meant that the therapist was the primary responsible person for

providing the atmosphere for change to occur. The clinician's duties entailed an evaluation of the client, program planning that allowed for little to no input from the patient; and implementation of the plan with the selection of appropriate activities that would meet the goals (Hightower-Vandamm, 1981).

Other areas of expertise that the occupational therapist demonstrated at that time included the fabrication of adaptive devices such as splints and self care aides. Wheelchair selection and home-based independent living appliance ordering were also performed by the practicing occupational therapy clinician (Hightower-Vandamm, 1981).

Administrative tasks during the seventies were limited to staff development, education, and the coordination of services with other related fields. Consultation and marketing skills were minimal; the bulk of the services provided was direct therapy (Hightower-Vandamm, 1981).

The past decade reflected two patterns of service delivery by occupational therapists. One involved the labeling by diagnostic category, such as psychiatric and physical disabilities. The other pattern appeared to be by specialization. The profession has been subdivided into specialty areas such as geriatric and pediatric care. Regardless of which pattern characterized the practicing clinician the treatment approach remained the same. There would be an assessment, a program plan, and a remediation process conducted by the therapist (Hightower-Vandamm, 1981).

The decade of the seventies was a period of high inflation for the nation as a whole and the medical industry as well. To illustrate how the state of the nation affects the state of medical care, a review of some pertinent history is needed. Prior to the seventies the Medicare program was enacted (Federal Register, 1965). Hospitals were fully reimbursed for services rendered on a reasonable cost basis. Such a method fostered a sharp increase of charges to the federal government. Hospitals were in fact encouraged by this method to provided even more services than were necessary since full payment was assured. Scott (1984) cited this increase from 6 percent of America's gross national product (\$3.6 billion) in 1965 to 10.4 percent in 1982 (\$84.2 billion). As a consequence, the federal government has become the single largest payer of health services rendered (Scott, 1984).

As a result of this excessive use the federal government has recently taken strategic action that is revolutionizing the health care industry (Federal Register, 1983).

Present State of the Art

The federal government's actions to urge cost containment by the medical industry have directly affected the profession of occupational therapy. Cost containment is the focus of the future for the stabilization of the economy (Federal Register, 1984). To meet the demands of legislators and consumers cost effective approaches are being emphasized in the medical model.

Recent legislative action has been taken to avoid insolvency associated with Medicare and Medicaid reimbursements. Because the

federal government has become a major payer for medical services rendered, such legislative action has caused a significant impact on the overall operating procedures of the various medical facilities. Such changes have been noted to influence other third party payers to follow suit (Scott, 1984).

The federal government has begun to use health maintenance organizations and other prepaid health plans in an effort to provide cost-effective health care. The use of statewide intermediaries has been studied by the federal government and found to be more effective in onsite review of health care facilities. Such a method of local review has been proven to be significant in assuring improved reimbursement determinations and curbing excessive use of services that lead to overpayments by the federal government (Federal Register, 1983).

The prospective system of payment by the federal government is causing much pressure on medical services to show accountability. Patients are now listed by a method called Diagnostic Related Groups. This method is attributed to a ten year study at Yale University's Center for Health Studies (Scott, 1984). A payment rate is given to each diagnostic group. The government pays according to the rate in full at the beginning of the contract period based on the contractor's projection of services to be rendered. Because block funds are submitted at the beginning of the fiscal year, there is a "risk basis" to the institution (Federal Register, 1983, p. 54014). There is a possibility that the contractor's actual cost of services rendered

could exceed the reimbursement that is determined at the initial contract period. Because of this risk factor, pressure is applied to medical facilities to become more accountable for their individual services. If the hospital spends less money on a particular case than the indicated rate, it is permitted to retain the difference. This encourages a more efficient operation of the hospital complex. Rehabilitation and mental health services are presently exempt but will be included under this method of payment at a later date (Federal Register, 1983).

As a consequence of this new change in payment, the medical care industry has begun to scrutinize its various service providers, including occupational therapy. The health care services that prove themselves to be most cost effective and essential to the maintenance of health to the consumer will survive this change. Those services that do not will be terminated. As a result, occupational therapy finds itself involved in a revolutionary change with a challenge to compete with other related services which are usually less expensive to the consumer (i.e. recreational therapy, activity therapy) for the survival of the profession as a whole (Hightower-Vandamm, 1980).

The consumer now is given the opportunity to provide input in determining the treatment approach. Following a surgery that usually requires hospitalization, the patient now has the option of remaining in the hospital and receiving therapy on an inpatient basis, which is the most costly method, receive therapy on an outpatient basis, which is less costly, or just follow a written home program with periodic

checkups with the attending physician, the least costly approach. As a result of this change, hospitals are noting shorter stays in both chronic and acute settings with more consumer demand for outpatient clinics and consultation services. Employment of occupational therapists by these medical facilities is predicted to be reduced (Hightower-Vandamm, 1981). Such changes in employment opportunities are a challenge to the profession in measuring its effectiveness in the treatment process.

Uses and Benefits of Microcomputers

Since the field of occupational therapy is presently experiencing increased scrutiny, accountability could be approached with the use of a microcomputer. Other related fields have already demonstrated the machine's effectiveness with their area of specialty. The hospital institution has used the computer as early as the sixties (Carpenter, 1983). In the seventies, the duties of the computer were primarily ascribed to fiscal applications that eventually expanded to materials management and personnel administration. The hospital institution is now designing medical information systems that have the capability of collecting and processing clinical data (Carpenter, 1983). Since the hospital has demonstrated an over-arching use of the computer, a review of the literature will focus on the application of the microcomputer by related fields. This focus will reveal the impact that the microcomputer has made on the health care professions as a whole. Specific uses of the microcomputer by occupational therapists will then be studied.

Medical Practice. The medical service has taken the lead in the utilization of the microcomputer. There are professional journals that have evolved solely for the purpose of research and study of the microcomputer with medical care. An example is the study done on the Lithium Index by Ackerman. This index is a computer consultation program was developed at the Lithium Information Center. Results of the study revealed that speed and flexibility were experienced with the use of the microcomputer. This new technology allowed for the physician to make well informed decisions that were based on the most current and accurate data possible. Consequently, the microcomputer has become a vital tool in the area of research for data analysis (Jensen, Slocum, Larson, James, Singer, 1983).

Many studies have also been done by physicians in the uses of the computer in the area of practice. The traditional approach to computer-assisted medical decisions is now being challenged by a new approach. The old method of having a computer to assist a physician's decision-making process by collecting data and arriving at similar conclusions as the doctor's, is now being updated by a newer approach. Miller (1984) reported on this new approach, called the Medical Plan-Analysis (MPA). Rather than duplicating the physician's decision-making process, the MPA system critiques the management plan. This approach requires a higher level of manipulation of the data by the computer, and hence gives better insight to the physician into decision-making matters. The computer, consequently, has the capability of providing for the most current and accurate data possible

to the physician.

Another illustration of the physician's use of the computer is the Data Acquisition in Neurophysiology (DAN). This is a flexible electronic device that collects data on the neurophysiological state of patients. It is a portable system which can easily be situated by a patient's bedside to monitor his health. Babies in incubators are also monitored with these machines. This DAN is reported to measure a wide range of neurophysiological concerns (McAllister, Armstrong, McClelland, Linggard, 1983). The primary advantage to the physician is its low cost, portability and flexible nature.

Psychiatry. The field of psychiatry has also taken advantage of the benefits of the uses of the computer in its area of specialization. Since psychiatric nomenclature has been noted to not be as standardized as that of the medical model, psychiatric labeling has been known to be inconsistent (Hammond and Munneck, 1984). The computer has been used to assist in treatment planning. The device retrieves, analyzes and writes psychiatric treatment plans. Such data have been found by Hammond and Munnecke (1984) to be beneficial in research, quality assurance, and management of the facility. With the advent of this new technology, these researchers foresaw a master problem list being developed from a summation of treatment outcomes and goal achievements.

Psychology. Psychotherapists have also taken steps in applying the microcomputer to treating patients. Zarr (1984) characterized the tool as being flexible, consistent, and economical. Because of these

features, the computer becomes an extension of the psychotherapist whereby the patient can continue to be involved in treatment at home in between therapy sessions. In regard to the indigent, computer-mediated psychotherapy terminals such as Eliza could be made available on disc or cassette for public terminal or home use. This method is best used on an individual treatment basis and not family or group treatment. There should also exist a potential for change (Zarr, 1984).

Nursing. Carpenter (1983) noted that at present nurses have used the computer primarily for clinical applications. There is a need for nurses to demonstrate skill in preparing and implementing automatic data processing plans (ADP) (Carpenter, 1983). England is reported by Austin (1979) to utilize an experimental hospital information system which determines personnel needs by the specific care plans entered into the computer.

Zielstorff (1984) noted two major areas of computer use for the nursing profession. Automated nursing information systems should provide support for decision-making on a day-to-day basis and then be made to manipulate such data for clinical research purposes. Secondly, nurses could individually contribute to the data bases for statistical manipulation in research designs (Zielstorff, 1984). Nurses have found the benefits of using a computer to be increased accuracy, increased time savings, and accessibility to information needed in patient care (Drazen, 1983). The computer has also been noted to be essential in the development of a quality assurance model (Edmunds, 1983).

Education. Education has benefitted from the uses of the computer in both the classroom and in research. Colleges have now developed complete programs of a specific area of study on the computer. Research and administrative tasks are documented to be more efficient with the use of the computer (Baum, 1983). Such technology has filtered down to the secondary and elementary schools. The drill-practice format of the computer-assisted instructional approach (CAI) has proven to be an effective way in building skill for both the normal and special child (Langford & Fidler, 1984).

The use of such computers has spurred a significant increase in motivation to learning as documented by the student's performance level in the classroom. The word processing program is one of many examples that has been studied and found to provide a powerful resource for the teaching of reading and writing skills (Smith & Gray, 1983).

Special Education. This specialty area of education has also embraced the uses of the microcomputer in the classroom. This device has been studied and found to provide an ideal one-to-one learning atmosphere that is so needed by children in special education (Boettcher, 1983). The microcomputer has the capability of demanding a response from the student and providing immediate feedback. The machine also helps the student with reversal problems by requiring accuracy in the responses. Multisensory learning is also an attribute of the microcomputer that taps the needs of the special child. Not only does the computer provide visual stimuli, it also has the capability of eliciting auditory cues (Boettcher, 1983). The research

studies done in education have proven the computer to be a successful supplement to teaching, with less time noted in the learning process (Broche, 1983). Since both occupational and physical therapy services have become an integral part of education for the handicapped as mandated by Public Law 94-142, such changes in the educational model will influence goals and objectives set by these professions. The law states that all handicapped children have the right to a free and public education and related health services in order to maximally benefit from that special education. Related services are indicated as follows:

Nonacademic and extra curricular services and activities may include counselling services, physical recreational athletics, transportation, health services, recreational activities... (Federal Register, 1977, p. 22683).

The therapist's treatment program must be related to the classroom teaching approach so that the child can maximally benefit from the special education.

Occupational Therapy. With the impact of federal regulations on accountability and the advent of high technology, occupational therapists are faced with the challenge to maximize the uses and benefits of the microcomputer for the profession to grow. This technology has the ability to provide easier access to information and contribute significantly to cost-effective ways in demonstrating accountability. Occupational therapists need more sophisticated means of measuring productivity. An emphasis should be made in the methods

of service delivery. The shortest treatment time identified with quality maintained should be a priority of the clinician. Greater utilization of certified occupational therapy assistants are predicted by Baum to be used in containing cost. The computer could more specifically facilitate data analysis in research, marketing, and administrative decision-making duties (Baum, 1983).

Mansfield has undertaken the use of a microcomputer in psychiatric occupational therapy. She has found computer analysis of departmental overhead costs to individual treatments to be expedient in identifying total cost for each procedure performed. This unit was able to project services for the next fiscal year which meets the demands of accountability (Mansfield, 1983). Containment of cost aids in overall budget estimates, a prime concern of legislators and the consumer. The Institute for Rehabilitation and Research in Houston has been cited by English for their use of the microcomputer with physical disabilities. The computer was used to assist in administrative and planning tasks. The device obtained objective scoring of a patient's level of functioning (English, 1975). Newson (1975) researched and reported on the effective use of the microcomputer in assisting occupational therapy clinical interns in relating classroom knowledge to actual practice of evaluating and treating spinal cord injured patients at the same center (The Institute for Rehabilitation and Research in Houston). Newson also reported that the center had thirty computer programs in operation at that time.

Hawkins and Hawkins (1978) have reported on computer-assisted

placement of occupational therapy students into clinical settings as a requirement for completion of studies in the field of occupational therapy. The Hawkins' study found the microcomputer to be beneficial in the accurate placement of students. Time efficiency was also noted with some allowances made for individual preferences of students. Youens (1980) conducted a similar study with physical therapy students. She field tested a student evaluation form of those students involved in clinical internship. The evaluation form was analyzed with the use of a computer. She found the computer to be most effective in gathering and utilizing data in her efforts to rate clinical education experiences (Youens, 1980). The Physical Therapy Journal of the American Physical Therapy Association now has a regular feature entitled 'Computer Communication' which relates computer news to physical therapists as it pertains to their profession (Krebs, 1984).

In the area of treatment, there have been fewer documented studies on the uses of the computer by occupational therapists. Most studies on the uses of this tool have concentrated on administrative, research, or educational concerns. Smith (1973) has taken a lead in the study of the computer with the handicapped. She used various microfilm equipment operations, remote computer programming, and some data entry operations (keypunch, add-punch and optical character recognition typing) with certain handicaps identified as unadaptable for conventional vocational rehabilitation programs (Smith, 1973). With the use of these forms of technology, Smith enabled the handicapped to become more productive citizens. According to Smith, more research is

needed in this area of computer use in treatment.

In the area of prevocational assessment, occupational therapists could investigate employment of the handicapped with skills in computer science. The computer is also noted to be an excellent source of leisure time activity with the elderly and the severely handicapped individual. The average life span of the general public is increasing. Consequently, the aged will be a source of increased services needed from occupational therapists. Computer use in the area of leisure time activity and self care skills will be of great benefit to occupational therapists (Baum, 1983).

Changes are rapidly occurring in computer technology. Occupational therapy management, research, evaluation, and treatment will all be affected by this new technology. It is imperative that occupational therapists meet that challenge by becoming educated in the various uses of the computer (Baum, 1983).

Summary

Observations from the review of literature reveal the following factors. Historically, occupational therapy was embedded in the medical model with services provided directly to the consumer with little to no input made possible by the consumer in regard to his therapy program. The recent legislative action taken by the federal government to curb the sharp increases in health care costs has required accountability from the health care industry. Other related professions have already taken the lead in using the microcomputer for the benefit of their areas of expertise. Few research studies in the

area of occupational therapy presently exist which indicate a need for more interest in this revolutionary device. The profession of occupational therapy could capitalize on the noted advantages of using the microcomputer in research, administration and treatment in meeting accountability requirements which appear to be the major issue at this time in occupational therapy practice.

Chapter III

Methodology

Subjects

The subjects in the present study were fifty-nine occupational therapists employed at seven occupational therapy departments in the Dallas - Ft. Worth metropolitan area. The subjects represented the total population of all occupational therapists using the microcomputer in the researcher's designated area. Four of the clinics were situated in hospital-rehabilitation complexes, one in a rehabilitation center, one in a school district, and one in private practice. Six of the facilities were located in the Dallas area and one in Ft. Worth.

The nine respondents who represented the fifty-nine in the interviews conducted reflected a diverse background. All respondents were females with ages ranging from 20 to 55 years (mean = 37.5). Fifty-five percent of the participants possessed master's degrees, thirty-three percent bachelor's degrees, and eleven percent certificates. Years of computer use by the respondents were noted to be as follows: forty-three percent reported seven to twelve months use; twenty-nine percent indicated thirteen months to two years use; fourteen percent revealed one to six months use; and fourteen percent reflected a three-year use of the microcomputer.

The computers used by the respondents were noted to be similar.

They varied from a System's 80, an Apple, an Apple II, an Atari 100 to a big board system with a dot matrix printer. Seventy-one percent of these devices were acquired by an occupational therapy proposal to the facility. Fourteen percent were initiated by the head of the rehabilitation department and fourteen percent by husbands' interest. The computers were situated in small rooms designated as computer rooms in seventy-one percent of the centers visited. Twenty-nine percent had placed their computers in clinics, on wards, or in teachers' classrooms.

The remaining fifty subjects were evaluated by the observations conducted. Individuals operating the microcomputer included the occupational therapy staff, the patient, and other professionals (i.e. speech therapy, regular/special education teachers and aides, social work service, recreation therapy, and psychology). The type of software primarily used by these facilities was noted to be the word-processor, commercially purchased in basic computer language.

Instrument

The researcher used an onsite observation and personal interview survey form (see Appendix A). This survey identified the applications and benefits of the microcomputer with practicing therapists as they performed their administrative and therapeutic tasks. The form was developed with the standards of practice adopted by the American Occupational Therapy Association (1979) used as references for tasks and terminology. Austin's text entitled Information Systems for Hospital Administration (1979) was also used as a source for

computer science terminology and the hospital's application of such a device.

This survey consisted of three parts. First, administrative tasks were addressed with specific application of the microcomputer to management, marketing, and research purposes. Second, a concentration of therapeutic uses of the computer was studied. Specific areas of concern were recordkeeping, information systems approach, and adaptation of the microcomputer as a treatment modality. Third, the advantages of using a computer were examined in relation to the previously identified areas of application.

One hundred and fourteen true-false-type questions were developed with appropriate scoring indicated for statistical analysis. The 114 questions were first completed by an observation made of the site by the researcher. The same questions were repeated in a personal interview session with a therapist on staff. The observation and interview took place within one hour of each other on the same day.

Content validity of the instrument was determined by a panel of three judges. These participants were individuals educated in computer science and working in the field as either professors or technicians. The third judges were occupational therapists who have demonstrated an interest and some skill in computer science and how it applies to the field of occupational therapy. Reliability of the instrument was determined by the test-retest method. The Pearson product moment correlation was used in comparing the initial and follow-up test scores for reliability of the instrument.

Procedure

The researcher used the 1983 Directory Trinity North District affiliate of the Texas Occupational Therapy Association, Inc. and an updated list from the author (Polliard, 1983) to identify all centers presently utilizing the microcomputer in their clinics. An appointment was then made to visit these centers. An observation of the clinic's use of the computer was made immediately before the interview took place. The therapist would demonstrate some of the clinic's use of the computer to the researcher, or the researcher would then observe the normal use of the device as therapy was in progress. The observation took place prior to the interview in an effort to control biased interview responses.

The interviewee was advised by the researcher to sign the personal interview form indicating her consent to act as a subject in the research study. The participant was made aware that her responses would be grouped with responses of other participants and that her name would remain anonymous. The examiner completed the survey form by allocating one point to the positive responses and zero to the negative responses of each item in question, whether it be from the clinical observations or reported in the interview session. A follow-up visit was then made the following week with a repeat of the survey conducted to check for reliability of the questions asked and observed uses of the microcomputer in the clinics.

Data Analysis

The purpose of the observation and interview survey form was to

obtain information about the actual uses and benefits of the microcomputer by practicing clinicians. The chi-square test was used to relate item to item and area to area as categorized in the instrument. The Kendall rank-order correlation procedure was also used to identify the relationship among 'area totals' of the various areas indicated in the survey form. The test-retest method of reliability did occur within a one-week interval of the visits.

Chapter IV

Results

One advantage presented by the research design was the use of the total population in the study. Since the total population was known (the 1983 Directory Trinity North District affiliate of the Texas Occupational Therapy Association, Inc. and an updated list from the author), the researcher did not encounter the disadvantages of using a sample.

The statistical procedure used to analyze the data was as follows. The Kendall rank-order correlation procedure was used to determine any significant relationship at the .05 level among the six category totals (administrative tasks, marketing, research purposes, recordkeeping, therapeutic data, and treatment modalities). Administrative and therapeutic uses were ranked by a vote count (the highest score being ranked number one), resulting in $\tau = -.824$. The critical value for seven participants was noted to be .750 (see Table 1). The negative relationship between administrative and therapeutic uses did reach a significant statistical level and indicated a tendency of the centers to use the microcomputer for either therapeutic or administrative purposes but not for both.

The chi-square test was used to determine the "fit" between actual frequency counts and expected frequency counts of both the

Table 1
Correlation Between Administrative and Therapeutic
Microcomputer Uses by Facility Type

Subjects	Administrative Rank	Therapeutic Rank
Hospital/Rehabilitation Complex	6	3
Rehabilitation Center	3.5	.5
Hospital/Rehabilitation Complex	6	3
Hospital/Rehabilitation Complex	3.5	5
Hospital/Rehabilitation Complex	2	6.5
School System	6	1
Private Practice	1	6.5

The above data were a case of tied ranks, so a Kendall τ was computed on the ranks.

$$\tau = \frac{S}{\sqrt{\frac{N^2 - N - T_x}{2}} \sqrt{\frac{N^2 - N - T_y}{2}}} = \frac{-14}{\sqrt{\frac{49 - 7 - 8}{2}} \sqrt{\frac{49 - 7 - 8}{2}}} = -.824$$

Critical value @ .05 level = .75, p .05

observed and interviewed vote counts. The variation in scores by category revealed a significant departure from the expected frequency counts in all categories at the .05 level except for the section that covers treatment. The data suggest the centers' actual use of the microcomputer to be minimal when compared to the potential uses of the device. Review Tables 2 and 3 for a summary of the chi-square test scores.

Table 2
Chi-square Observation Test Scores

Category	Observed Frequency	Expected Frequency	X ²	Significance
Administrative Tasks	2,61	31.50	31.50	yes
Marketing Tasks	0,21	10.50	21.00	yes
Research	1,41	21.00	38.10	yes
Recordkeeping Tasks	3,53	26.50	47.34	yes
Therapeutic Data	0,35	17.50	35.00	yes
Treatment	14,28	21.00	4.67	no

p < .05 in all categories except Treatment

*Observed Frequency: The first number represents the actual number of events noted in the observation survey. The second number represents the events not observed in the observation survey.

*Expected Frequency: This figure represents the anticipated number of events for each of the two number cells indicated in the Observed Frequency category.

Table 3
Chi-square Interview Test Scores

Category	Observed Frequency	Expected Frequency	X ²	Significance
Administrative Tasks	5,58	31.50	44.59	yes
Marketing Tasks	2,19	10.50	13.76	yes
Research	2,40	21.00	34.38	yes
Recordkeeping Tasks	7,49	28.00	31.50	yes
Therapeutic Data	0,35	17.50	35.00	yes
Treatment	25,17	21.00	1.52	no

p < .05 in all categories except Treatment

*Observed Frequency: The first number represents the actual number of events noted in the interview survey. The second number represents the events given a negative response in the interview.

*Expected Frequency: This figure represents the anticipated number of events for each of the two number cells indicated in the Observed Frequency category.

The following is a summation of the actual tasks of each category noted to yield the largest vote count of the respondents in their use of the microcomputer.

Administrative Tasks:

- scheduling of patients for therapy

Marketing:

- mass letter printouts

Research Purposes:

- assistance in test administration
- interface with main frames/data bases of remote computers

Recordkeeping:

- evaluations

Therapeutic Data:

- none

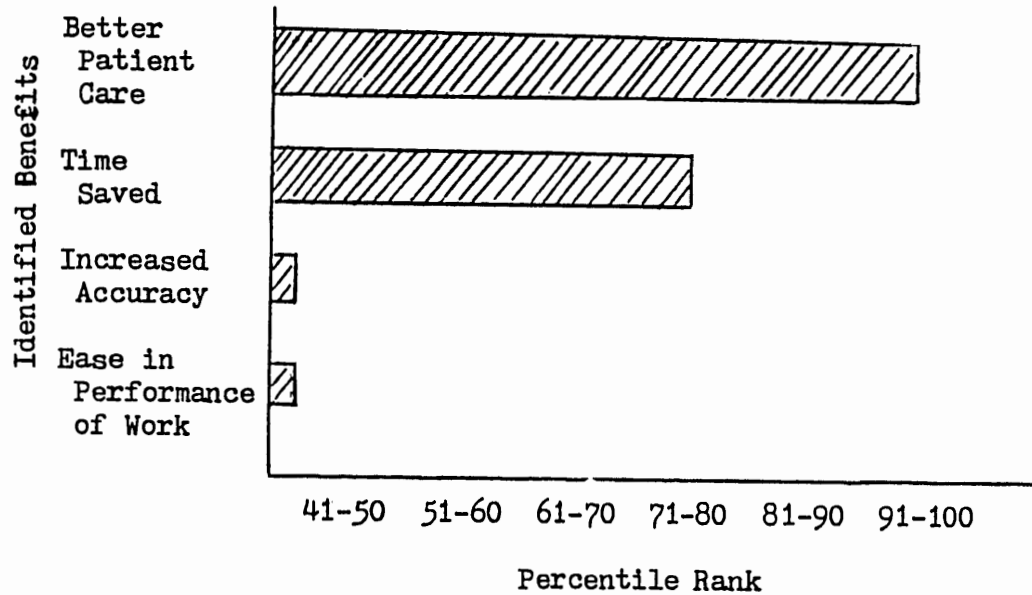
Treatment Modality:

- promotion of eye-hand coordination
- enhancement of visual tracking skill
- alternative to handwriting skill

Perceived benefits of the microcomputer were grouped under four main areas. These areas included: 1) better patient care; 2) time saved; 3) increased accuracy noted; and 4) ease in performance of duties noted. Review Table 4 for a breakdown of the vote count. Note the concurrence of all participants in the study that the microcomputer provided better quality patient care.

Future uses of the microcomputer by these centers was noted to be

Table 4
 Perceived Benefits of the Microcomputer
 By the Participants



varied. The largest category of "other" consisted of thirty-four percent of the grouped responses reflecting a large listing of individual needs. These needs included: 1) increased in-house programming; 2) greater utilization of eye-hand coordination software; 3) initiation of data collection and storage; 4) more testing done by the device; 5) greater variety of commercial software made available; 6) need for more computers in the therapy clinics; and 7) improved computer knowledge on the part of practicing therapists.

Nineteen percent of the answers indicated research as a major area of future use. Nine percent of the future tasks was greater use of the work processor in report writing. Six percent of the identified future uses was noted to be: 1) mass letter printouts;

activators, Morse Code techniques; and 3) increased vocational training used (see Table 5). The same data were illustrated by number count (see Table 6).

Table 5

Future Uses of the Microcomputer by the Participants

As Identified by Tasks

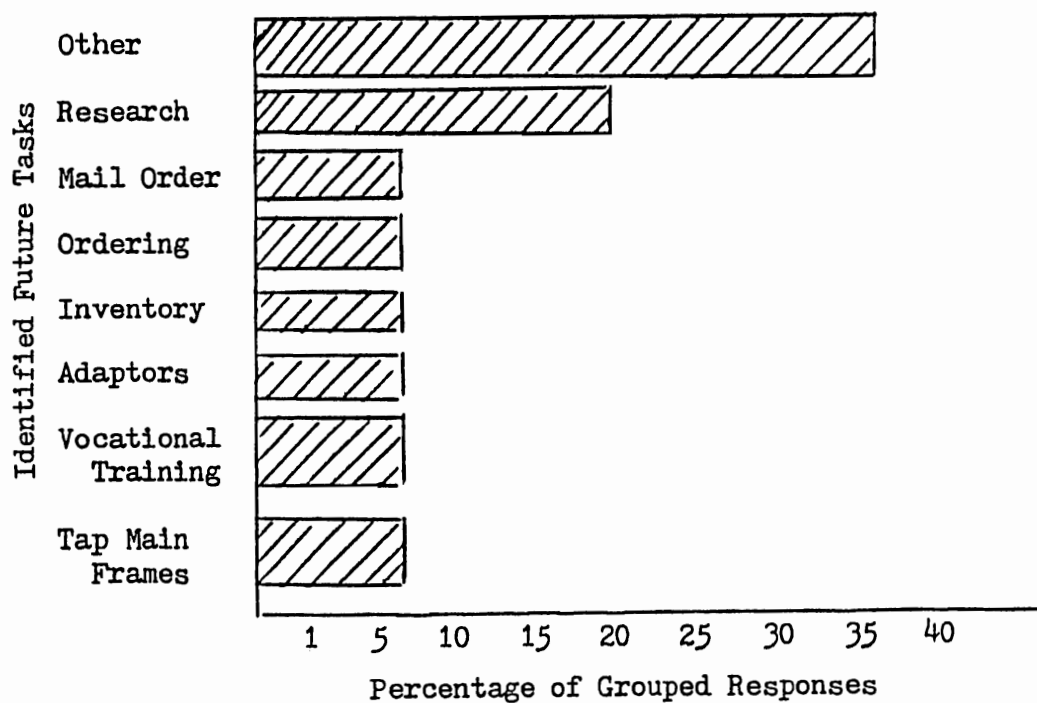
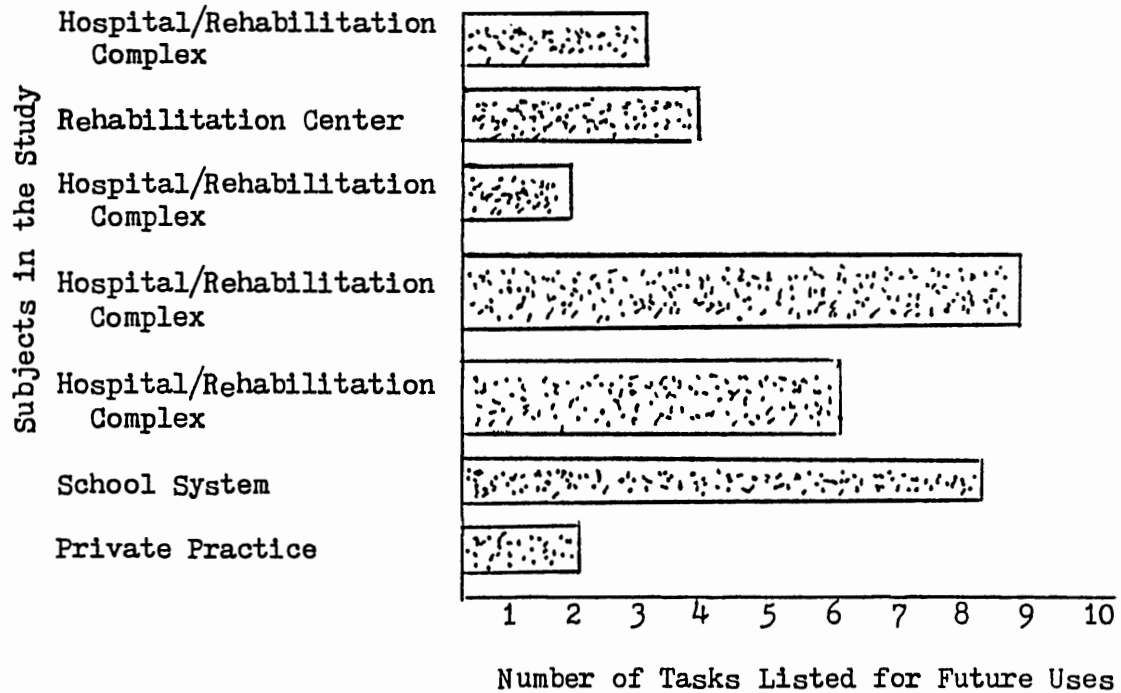


Table 6
 Future Uses of the Microcomputer By Number Count
 As Identified by Participants



The test-retest method was used to identify reliability of the questionnaire. The researcher compared the two sets of scores from the two visits. The initial and follow-up observation scores revealed no significant relationship ($r = -.03$). This lack of relationship was due to the fact that upon the first visit, an effort was made by the respondents to demonstrate how they used their microcomputers. In the latter visit, no such attempt was made. Test-retest correlation coefficient for the interviewed scores was $r = .998$ (denoting a strong relationship between the answers of the initial and follow-up interview scores).

Chapter V

Summary, Discussion and Recommendations

Summary

Seven occupational therapy clinics in the Dallas - Ft. Worth metropolitan area were surveyed by using an observation and personal interview approach in identifying the uses and perceived benefits of microcomputers. The Kendall correlation was used to determine any significant relationship between the two categories under study — administrative and therapeutic uses. Since the critical value of significance was obtained ($\tau = -.824, p < .05$), the data reflected a tendency of occupational therapy clinicians to use microcomputers for only one of the two major potential uses (administrative and therapeutic) and not both - a negative correlation. The chi-square test determined how good the "fit" was between actual frequency counts and the expected frequency counts of the observed and interviewed scores in each category of use. A significant departure from the expected frequency was noted in all but one category: treatment. The tests revealed the therapists' actual uses of the computer to be minimal as compared to the potential capabilities of the device. Perceived benefits of the microcomputer fell into four major areas:

- 1) time saving;
- 2) increased accuracy;
- 3) ease in performance; and
- 4) better quality patient care.

Discussion

Exposure to microcomputer use did apparently influence the practice of occupational therapy in the centers studied as evidenced by their perceived benefits of its use. This seems to be consistent with other studies such as Mansfield (1983), Newsom (1975), and Smith (1973) in showing the uses and benefits of microcomputers in occupational therapy practice. Even though they reported use of the microcomputer for only one of the two areas noted (administrative and therapeutic) their perceptions indicated that it was beneficial.

Mansfield (1983) found computer analysis of her psychiatric department's costs to be expedient in relation to individual treatment. She could identify total costs for each procedure performed and consequently project services for the next fiscal year. This met the demands of accountability for her service.

Newsom (1975) applied the microcomputer to an administrative task computer-assisted staff development. She engaged occupational therapy interns in the use of the device in relating classroom knowledge to actual practice. She found the computer to be effective in inservice training of occupational therapy students. Smith (1973) used the microcomputer in treatment. She was a pioneer in using the device in vocational training of the handicapped. She found the computer to be of significant benefit in her work program.

The present design has incorporated both administrative and therapeutic tasks while previous studies have only addressed one of the two. Because of this unique feature, the results of the study

should be of significant value to the practicing clinician in the decision to acquire a microcomputer for use in his/her clinic. Microcomputer skills could be strengthened by way of on-the-job training, adult education night classes, inservice workshops, and correspondence courses. Therapists could benefit from home computing in that it allows for greater practice in developing good computer skill. Also, computer retailers provide evening classes of basic computer programming skills that therapists could use. Subscription to the Journal of the Occupational Therapy Computer Club would also promote sharing of computer knowledge among therapists and the maintenance of a resource file.

These findings should also be pertinent to the faculty of occupational therapy schools for a better understanding of how computer technology has affected the practice of occupational therapy. An occupational therapy curriculum could incorporate the uses and benefits of microcomputer in such classes as organization and administration and tests and measurements. Practical experience on the computer could be an undergraduate requirement.

Recommendations

The following recommendations would serve to enhance knowledge and beneficial use of the microcomputer in the practice of occupational therapy. A research design could be developed to:

- 1) Determine whether there is a significant difference between occupational therapy centers using microcomputers and those following traditional practices.

- 2) Replicate the present study with a larger population.
- 3) Determine if the microcomputer actually improves visual perceptual and eye-hand coordination skills.
- 4) Identify the success rate of the handicapped adult population re-entering the work force as a result of computer training in occupational therapy.
- 5) Determine the success rate of the handicapped child in meeting academic demands with the use of the microcomputer by occupational therapy consultation in the school system.
- 6) Identify the advantages of using the computer in meeting cost accountability demands.
- 7) Determine the various adaptations associated with microcomputers that could be used by the handicapped.
- 8) Identify the commercial software available for use by occupational therapists. A critique of the procedural manuals could also be included in the study.
- 9) Identify the facilities using computer consultants for in-house programming and the benefits thereof.
- 10) Determine the attitudes of practicing clinicians as to the potential use of microcomputers in their clinics.
- 11) Investigate the patients' attitudes toward using microcomputers as therapeutic tools.

Appendix A

Observation and Interview Form

On the Microcomputer and Occupational Therapy

I UNDERSTAND THAT MY RESPONSE ON THIS QUESTIONNAIRE CONSTITUTES MY INFORMED CONSENT TO ACT AS A SUBJECT IN THIS RESEARCH. NO MEDICAL SERVICE OR COMPENSATION IS PROVIDED TO SUBJECTS BY THE UNIVERSITY AS A RESULT OF INJURY FROM PARTICIPATION IN THE RESEARCH.

Signature

Date

Sex: Male___ Female___

Age: 20-30___

 30-40___

 40-50___

 50 and above___

Type of Degrees:

 Bachelors___

 Masters___

 Doctoral___

 Certification___

Years of Work Experience:

 Below 2___

 2-5___

 5-10___

 10 and above___

Observation and Interview FormOn the Microcomputer and Occupational Therapy

<u>Obser.</u>	<u>Inter.</u>	<u>General</u>
		<p>Type of facility:</p> <ol style="list-style-type: none"> 1) home health 2) acute inpatient 3) chronic inpatient 4) school based 5) outpatient 6) nursing home care 7) other <p>History of Acquisition:</p> <ol style="list-style-type: none"> 1) grant 2) research study 3) inservice training 4) home computing initiated interest in purchasing one for the clinic 5) other <p>Departments using the computer:</p> <ol style="list-style-type: none"> 1) hospital administration 2) school administration 3) medical staff 4) teaching staff 5) nursing 6) laboratory 7) pharmacy 8) respiratory therapy 9) physical therapy 10) speech therapy 11) psychology 12) special education 13) other <p>In the O.T. Clinic, who operates the computer:</p> <ol style="list-style-type: none"> 1) O.T. Department Head 2) O.T. Staff 3) patient 4) other <p>Location of the computer:</p> <ol style="list-style-type: none"> 1) in the O.T. Clinic 2) on the ward

<u>Obser.</u>	<u>Inter.</u>	<u>General (cont.)</u>
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- 3) in the teacher's classroom
- 4) in the school' library
- 5) in another hospital department
- 6) other

What type of software does the O.T. Clinic use:

- 1) word-processing
- 2) data-management
- 3) spread sheet

Who developed the software:

- 1) purchased commercially
- 2) in-house programming
- 3) other

If programs are developed on-site, what language is used:

- 1) AIGOL
- 2) BASIC
- 3) COBOL
- 4) FORTRAN
- 5) PASCAL

Administrative Tasks

Is the computer being used for:

- 1) staffing patterns
- 2) vacation accrual
- 3) vacation scheduling
- 4) scheduling of patients for therapy
- 5) annual supply costs
- 6) cost analysis of each service provided
- 7) staff development with the use of computer-assisted instruction
- 8) storage of data on the department's overall quality assurance
- 9) other

Marketing

Is the following being performed on the computer:

- 1) mass letter print out for survey purposes
- 2) statistical analysis of data obtained from the survey
- 3) other

Obser. Inter.

Research Purposes

Do you use the computer to:

- 1) store large number of data
- 2) assist in test administration
- 3) perform statistical analysis
- 4) perform data base searches
- 5) access to main frames/ data bases on remote computers
- 6) other

Recordkeeping

Are computer files maintained on:

- 1) evaluations
- 2) progress reports
- 3) discharge summaries

Is the computer used to:

- 4) prorate data daily
- 5) produce revenue reports
- 6) produce a summary bill with diagnosis categories defined by the hospital
- 7) facilitate daily reports that sum up all of the financial activities of the previous day
- 8) produce a full financial statement of the department

Therapeutic Data

Is the computer used to:

- 1) house information on up to date tests that are categorized by diagnosis
- 2) provide treatment choices based on scientific studies that have been stored in the computer
- 3) maintain a data bank on treatment results that are categorized according to treatment technique
- 4) maintain an updated list of the most effective equipment identified for use in the various treatment approaches.
- 5) maintain an activity of daily living rating chart for day-to-day use

Obser. | Inter.Treatment Modality

Do you use the computer to:

- 1) engage in computer-assisted instruction in treatment
- 2) operate as a form of leisure time activity in therapy
- 3) promote eye-hand coordination
- 4) enhance visual tracking skill
- 5) operate as a pre-vocational tool for the physically handicapped (i.e. voice recognition)
- 6) operate as an alternative to handwriting skill

Perceived Benefits of the Computer as Indicated by the Therapist

Do you find that you save significantly more time with the use of the computer in:

- 1) management of the clinic
- 2) marketing your service
- 3) research studies
- 4) recordkeeping
- 5) therapeutic data bank usage
- 6) goal meeting in treatment

Have you found increased accuracy in your performance of:

- 1) management
- 2) marketing
- 3) research
- 4) recordkeeping
- 5) therapeutic data bank manipulation
- 6) goal meeting in treatment

Does the computer allow you more ease in performing:

- 1) management
- 2) marketing
- 3) research
- 4) recordkeeping
- 5) therapeutic data bank manipulation
- 6) goal meeting in treatment

Is better quality care noted from the use of this device?

What other tasks would you like the computer to perform in the future?

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