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ABSTRACT

This study utilized the techniques of future casting to generate a series of alternative futures from which policy implications for occupational education in central New York could be derived. Using the statements of future events derived from the first phase of the study, a series of twelve alternative scenarios were developed: (1) the changing social paradigm, (2) the graying of America, (3) the automated technological future, (4) the emergence of the public service economy, (5) the future of agriculture, (6) the high cost of medical education, (7) the escalation toward corporate occupational education, (8) the occupational education alternative, (9) reestablishing economic leadership, (10) meritocracy in employment, (11) public and private reaction to work shift values, and (12) education for work. These scenarios were analyzed by the regional occupational education planning committee to determine possible implications for occupational education programs relative to seven variables: curricula, instructional strategies, administration, students, faculty, resource allocations, and facilities. (Findings are reported in a series of charts which summarize specific trends and their implications for occupational education. The trends are grouped into seven categories: labor force, attitudes/values, educational policy and practice, demographic changes, technological changes, ecology, and public and social policy.) (LRA)

FUTURE EVENTS IMPACTING OCCUPATIONAL EDUCATION: A REPORT ON THE OCTOC FUTURES STUDY

VOLUME II

PREPARED BY
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INTRODUCTION

This report describes the second phase of a study which utilized the techniques of "future casting" to generate a series of alternative futures from which policy implications for occupational education could be derived. More specifically, the study attempted to identify the alternative futures which could have an impact upon occupational education in Central New York. The results of the study are being used by the Executive Committee of the New York State's Occupational Education Planning Region #9 in revising the region's long-range plan for occupational education.

The first phase of the study utilized the Delphi technique to generate a series of statements describing probable future events which were seen as having possible impact on occupational education. These statements were first elicited from a panel of individuals who, while not part of the region's occupational education system, would have knowledge of various types of future events (i.e., technological, economic, demographic, etc.) affecting occupational education. This group of individuals were also used in subsequent rounds of the Delphi procedure to refine the likelihood of occurrences, estimated date of occurrence and probable impact of each event upon occupational education.

This second phase of the study used the statements of future events derived from the first study as the basis for developing a series of alternative scenarios. Once refined by the region's planner-facilitator team, these scenarios were then analyzed as to possible implications for occupational education. This volume of the report describes the results of these trend analysis techniques.

METHODOLOGY

The methodology used in the second phase of the study proceeded through the following four major activities:

a. Assessing the interrelationships between the future events identified through the Delphi conducted in the first phase of the study;

b. Development of a series of event constructs or networks which depicted a logical sequence of events, that described alternative futures with which occupational education might have to contend;

c. Analyze these alternative futures as to the common and/or significant future trends prevalent in them; and

d. Identify the implications of these significant future trends for occupational education policy making and planning.

ASSESSING THE INTERRELATIONSHIP OF EVENTS

The technique of Cross Impact Matrix was initially used to assess the relationship between the forecasted events. The intention was to determine the impact one event could have upon the occurrence of other events. The Cross Impact Matrix technique was seen as especially useful in estimating the importance of an event's occurrence on the probable occurrence of related events. The ability to estimate this importance becomes critical in identifying the extent to which the occurrence of a particular event, if it were to occur, could be expected to alter the future.

Initially, the assessment of the probable impact of the forecasted events was done by the persons forming each subgroup comprising the study's Delphi panel. Each individual from a subgroup was sent a questionnaire which listed, in the form of a matrix, all events forecasted by that particular subgroup and asked, using a scale of +3 to -3, to determine the impact of each row event on the probable occurrence of each column event (see Appendix A). In addition, the respondents were requested to list the major factors which the respondent believed could either inhibit or enhance the event's impact on the other events. This procedure had to be later modified as it became apparent that many respondents found the form

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[1] Delayne Hudspeth, "The Cross Impact Matrix," *Futures in Education: Methodologies*, ed. Stephen P. Hencley and James R. Yates (Berkeley: McCutchan Publishing Corporation, 1974), pp. 115-126.

too long and tedious to complete. Thus, most Delphi panel members failed to either complete a portion or all of the questionnaire. Consequently, the process was changed so that the members of the study team collectively assessed the impact of an event on other events using the Cross Impact Questionnaires.

The information which resulted from the Cross Impact Matrix for each event was a numerical estimation of the following:

a. the impact of a particular event on other events; and

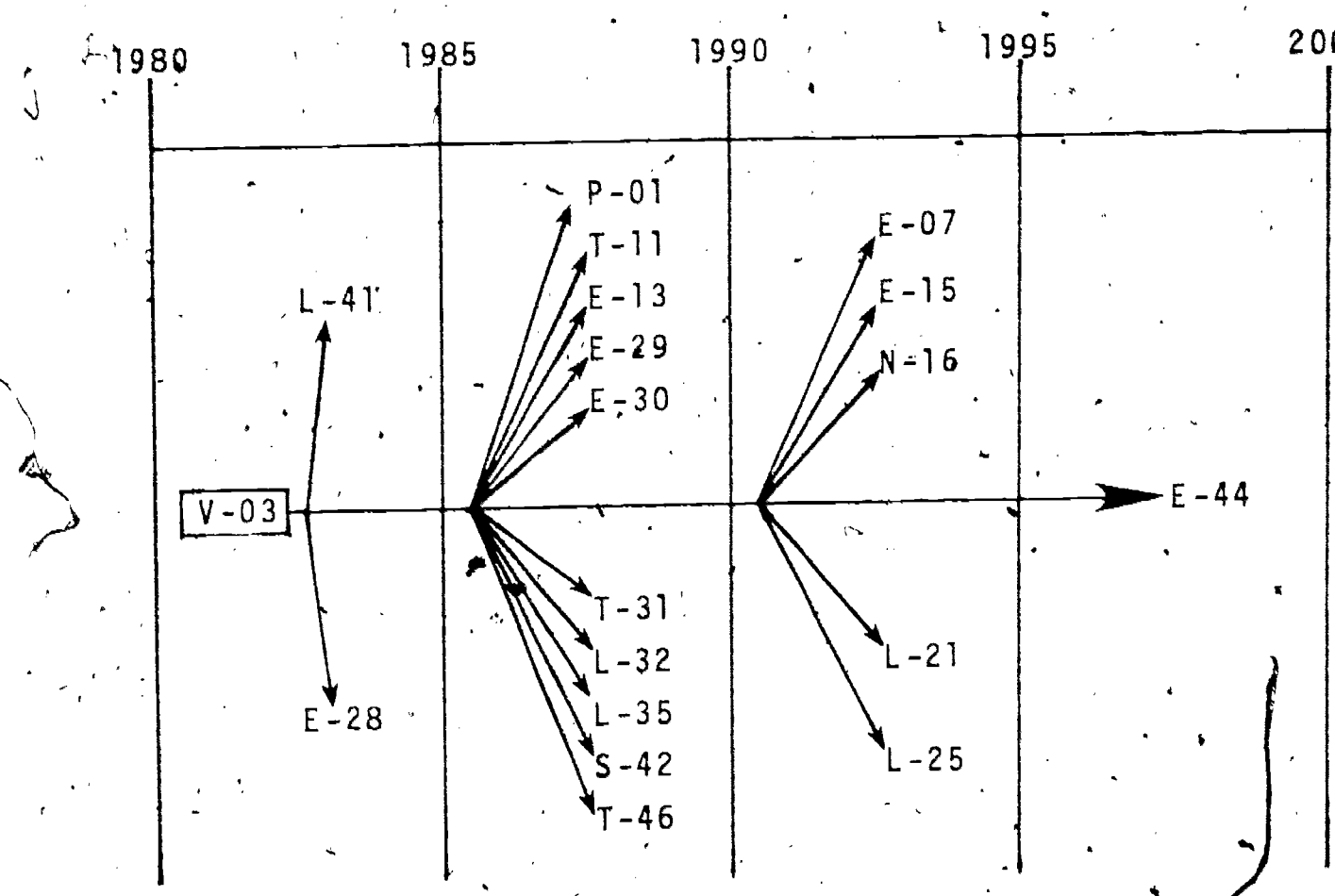
b. the sensitivity of a particular event to the occurrence of other events.

This information allowed the study team to determine the extent that each event could, on its own, "drive" a particular set of events which could materialize into an alternative future scenario. Concurrently, the event's sensitivity index provided the study team with some insight into the probability of whether a particular event would occur or not given the occurrence of other events or sets of events.

Once all events had been subjected to the analysis of a Cross Impact Matrix, the study team developed a series of "event networks", or event trees as they are sometimes labeled.

FIGURE I

SCENARIO V-3



The concepts underlying this phase of the methodological procedures followed by the study team were adapted from the Field Anomaly Relaxation (FAR) Method used by the Educational Policy Research Center at Stanford Research Institute.[2] The FAR method allowed the study team to lay out, in a plausible sequence, events of various types (i.e., technological, economic, etc.) while integrating into the process the information about each event generated from its Cross Impact Matrix.

The process followed in developing each "event network" consisting of the following steps:

1. Selection of an event (Event A) in the near future (before 1985) which met two conditions:

   a. high likelihood of occurring; and

   b. high positive impact (+2 to +3);

2. From the remaining events, selection of those which were positively impacted by the event chosen in step 1 and plotting them out in sequential order by their date of occurrence;

3. Analysis of the internal sensitivity among the events selected and the elimination of those events which were negatively impacted by a proponderence of the events selected; and

4. Diagramming the event network on a timeline (see Figure I).

The completed "event network" formed the basis for a particular scenario. In outline form, it identified those events which, if they were to occur, would either reinforce, or at the very least, not inhibit, the occurrence of other events comprising the particular event sequence. There were twelve (12) scenarios which resulted from following this process.

Once the scenarios were finished, they were distributed to members of the regional occupational education planning Executive Committee. Attached to each scenario was a reaction form (see Appendix B). Each member was asked to first read the scenario and then identify what impact the scenario might have on their agency's occupational education programs relative to the following seven (7) variables:

a. curricula;

b. instructional strategies (i.e., mode, media, etc.);

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[2] Russell R. Rhyne, *Projecting Whole-Body Future Patterns - The Field Anomaly Relaxation (FAR) Method* (Menlo Park: Stanford Research Institute, 1971).

c. administration/governance;

d. students;

e. faculty;

f. internal/external resource allocations; and

g. facilities.

Concurrently, the study team extracted, from the entire set of scenarios, those significant trends which had a high likelihood of occurrence and appeared to be common to many, if not all, of the scenarios. These trends were then grouped according to seven (7) categories:

a. labor force;

b. social and personal attitudes/values;

c. educational policy and practice;

d. demographic changes;

e. technological changes;

f. ecology; and

g. public and social policy.

Using the information obtained from the reaction forms collected from the Executive Committee members and the categories trends, a series of charts were then formulated. Each chart, which corresponded to the trend categories, summarized the specific trends associated with that category and the logically derived implications for occupational education from those trends. These charts are found in Section IV of this report.

SCENARIOS

This section of the report contains the twelve (12) scenarios formulated during that stage of the study. The titles of these scenarios are as follows:

1. The Changing Social Paradigm
2. The Graying of America
3. The Automated Technological Future
4. The Emergence of the Public Service Economy
5. The Future of Agriculture
6. The High Cost of Medical Education
7. The Escalation Towards Corporate Occupational Education
8. The Occupational Education Alternative
9. Reestablishing Economic Leadership
10. Meritocracy in Employment
11. Public and Private Reactions to Work Value Shifts
12. Education for Work

Three of the scenarios deal with possible changes in either the occupational education delivery system or attitudes toward occupational education. One scenario outlines the possible events which could result from the change occurring in America's population, which is tending toward increased numbers of older persons. Economic events and their importance are addressed in two scenarios, while changing social values, and in particular, work values, are dealt with in three scenarios. The remaining two scenarios deal with technological changes in general, as well as in the fields of automation, agriculture, and medicine.

The Changing Social Paradigm

After the pluralism of the last thirty (30) years, the values underlying American society had crystallized by the year 2000 into a single social paradigm. The roots of this paradigm are found in the 1960's

and 70's, within the ecology movements, the growing disenchantment of the American People with the responsiveness of their political, economic, and social institutions to the crisis of the period, and the disillusionment which spread throughout the society regarding the gap between the promise of the American dream and the reality of its achievements. Most importantly, the profound influence of the demographic change of American society whose vision was once dominated by the young to a society where the predominate concerns are those expressed by the mature and aged.

The economic values of America in the year 2000 are premised upon a revised notion among American's about "the good life." The belief historically held by Americans that economic growth is the basis for an improved way of life has changed. In a series of public opinion polls conducted across the United States in the late 1990's, almost half of the American public rejected the notion that economic and material growth was beneficial, good for society, and an appropriate national goal for the United States. Increasingly, there are indications that this belief is growing. Many people have rejected the use of large scale technologies to produce the things they need. They are turning to developing small scale technologies in assisting them in being self-sufficient. The prevalence of shortages of various consumer goods and services has helped fuel this trend.

The traditional work ethic of the American worker has also undergone a change in the last quarter of the twentieth century. Practically all indices of the average rate of productivity of American workers has shown a steady decline over the last forty (40) or fifty (50) years. Although American unions had received increased wages, productivity did not keep pace. Inflation also contributed to declining productivity. In addition, most observers, regardless of their economic persuasion, point to the cost of governmental programs and regulations of the 60's and 70's which were passed on to the consumer. This tended to destroy the economic incentive which existed for people to increase their productivity in their role as a worker. Even the notion of unemployment has been impacted. Most business and governmental leaders, liberal or conservative, now accept an eight (8) to ten (10) percent unemployment rate as satisfying the goal of full employment. Massive public work programs, particularly among young people, help keep this employment rate in a steady state.

The values underlying the American nuclear family have also undergone a change. Women's liberation and the women's rights movement of the 1970's and 80's was a major factor in this change. The passage of the Equal Right Amendment and affirmative action legislation also contributed to it. It is accepted by most people that women have the same right to work opportunities as men. The increased number of women acting as single heads of household helped contribute to the revised role of women. Many employers, to accomodate to increased number of women employees, have revised their employment practices to include job sharing, flexible work schedules and shorter work weeks. Increased percentages of women are occupying many roles traditionally occupied by men. While there is still a little disparity, the gap has almost closed between the rate and the number of women who advance to responsible job positions and receive compensation equal to that of their male counterparts.

There is less stereotyping of sex roles in the typical American home. Husbands and wives share equally in work, household, and childrearing roles. Although many psychologists and marriage counselors report increased strain on marital relationships, most observers agree that the more equitable sharing of roles is providing some benefits to the American families. Children, in particular, are learning to be more responsible for the work needed to be done in the household, as well as being self-sufficient. Among many couples, a formal marital relationship has not been entered into, but the living arrangement agreed to by such couples seem to have as much permanence as formal marriages.

Many persons find the same psychological security once provided by the family through their participation in "growth groups." Such involvement in person-centered growth groups allows the participants to learn techniques for self-actualization and coping with stress. There is a growing realization that persons who can satisfy their psychological needs and cope with stress live longer and more productive lives. Increasingly, employers are encouraging their employees to participate in such groups.

Leisure and recreation play a big part in the life of the average American. Typically, workers at higher income levels are more inclined to trade off increased wages for more time to spend on leisure time activities. Personnel Directors have observed increasing numbers of workers who are willing to sacrifice job advancement for more leisure time.

The federal government's Office of Social Indicators reports that the average American has increased the percentage of his/her personal and family income which is spent on entertainment and recreation. The most rapid increase in leisure time activities has been in the area of physical exercise and participative sport activities.

The Graying of America

As American society enters the twenty-first (21st) century, few of its characteristics are more dramatic than that of the growth within the population of senior citizens. If the American of the 1960's and 70's was called "the Youth Culture," the America of 2000 is being termed, "the Gray Culture." The fact that there is a larger percentage of the population over the age of 55 years old, in comparison with that which is under 25 years of age, has altered many aspects of American society. The shift in an American market, whose goods and services were historically geared to the young, has resulted in numerous dislocations in the economy. Such American industries as that of wearing apparel, recreation, entertainment, automotive, and housing, to name a few, now find themselves struggling to master a market made up of persons who are less inclined to be self-indulgent and engage in unrestricted buying of consumer goods. Economists are expressing grave concern that the continued decline in the demand for consumer goods caused by the value shift reflected in this demographic change will further limit the economic growth of the country.

The needs of this segment of the population are also having an adverse effect on relationships between young and old. The young working population, who is supporting the services required of the senior citizens through an increasingly heavy tax burden, are becoming disheartened. The increased strain placed on the social security system, health, welfare, housing and other public services by large numbers of older persons are now beginning to show in more incidents of public outrage.

There were a number of contributing factors to this change in the makeup of the country's population. One of the more important factors was the change in the rate of growth of the United States' population. Beginning in the late 1960's, demographers began to observe a growing trend towards a declining birth-

rate in the United States. This trend continued and increased in intensity during the 1970's and the 80's. Consequently, over a period of time, because of this lowering birthrate and because the members of the large baby boom of the 1940's and 1950's began to move into the age category of senior citizens, the resulting shift of the American population occurred in the late 1990's and early 2000. The advances in medical technology, change in personal habits, better methods of coping with stress and improved working and living conditions, all contributed to extending the life span. Due to a number of advances, a federal study released in 1990 also indicated that there had been a dramatic shift in the delivery of health care services over the previous thirty (30) year period. Specifically, there had been a decline in remedial health care services and a shift toward preventive health care services. This shift partially developed from the interest by the Federal government in preventive health care, and in 1992, Congress passed a law establishing a National Health Insurance system. Contrary to what some segments of Congress felt, the newly enacted federal legislation did not contribute towards the inflationary trend in the cost of health services in the United States. In point of fact, the law, once implemented, established very early, specific limits on the health care services to be provided and a maximum charge allowable for these services. The resulting increase in the number of recipients receiving those services called for under federal legislation shifted health care away from institutionalized medical care and towards that of preventive health care.

Concurrently, there was also a shift away from employing large numbers of higher level professionals engaged in delivering traditional health care services. In 1991, for example, the Syracuse area's Department of Labor reported that the number of paramedics and other physician substitutes presently employed in the area, now equal the number of doctors in the area. The professionalism of the health care para-professionals was further enhanced in the late 1990's by increased emphasis on the part of licensing boards to increase performance standards in all health care occupations for certification. In 1998, Alabama was the last state enacting legislation requiring licensing requirements for all health service workers including nurses, technicians and paramedical personnel. In most occupations within the health field, at least a two-year college degree was required. In many

of those health-related occupations which formerly required a two-year degree, a four-year degree was now the required entry-level certification into the occupation. By the end of the decade, the notion of preventive medicine was firmly established as the operating premise for most health care systems prevalent in the United States. At the present time, there are many local Environmental Health Monitoring Units (EHMU's) established which employ a large number of technically trained people in the health care area. The EHMU's not only monitor the quality of an area's environment, but more importantly through the media, public demonstrations, computer technology, and traditional medical practice place primary focus on maintaining preventive health care.

Another trend that contributed to the graying of America was the development and expansion of public and social service as a part of the American economy resulting from the rising expectations of a number of groups for such services. Not the least important in terms of its size was the elderly. This group increasingly made demands for expanded public and social services during the period of the 1980's and 1990's. The expectations grew among the elderly in the United States that the government had a responsibility to assist them in leading a meaningful and dignified life in their later years. Political activities among the elderly become more prevalent and successful in making these expectations into reality. And, as their numbers grew, so did their voting power. The results of this political activity to achieve more public and social services contributed to the growth of the public service sector of the economy, so that at the present time, public service is considered the major industry of the United States.

The rapid expansion of public services also was assisted by advanced technology during this time that computer technology made its major inroad, into public and social service agencies. Automation was used in a variety of ways within these agencies, such as determining applicant eligibility, payment and service record keeping case evaluations. Public service agencies increasingly had to make use of para-professionals and automation to meet their ever increasing responsibilities. This was caused by the fact that their budgets did not grow at the same rate as the services they provided. Consequently, in the late 1980's, the Federal government, taking notice of the situation, took a more active role in the regulation and funding of public and

social service programming. In 1998, the Department of Health, Education and Welfare made the historic announcement that it had completed the regulatory guidelines which local governments were to use in offices administering the uniform National Social Service program.

The Automated Technological Future

The rapid expansion of computer technology and allied communications capability brought about great changes in most aspects of the American way of life during the last twenty-five (25) years of the twentieth (20th) century. The increased computing capability, speed, size and price reduction, and ease of programming enabled many functions in the society to become automated. This one technological innovation spawned more change over the widest spectrum of endeavors than any other single technological development.

Expanded use of computer technology was most prevalent in commercial business and industry during the first part of the 80's, but soon spread to many other sectors, such as health and social services. Around 1985, the social service agencies in New York State began to utilize a computer network for determining applicant eligibility for services, records of services and payments, and annual case evaluations. In that same year, consumer convenience received a large boost when a nationally known mail-order retailer installed a computerized telephone order processing system in its Central New York stores which permits catalog shopping day or night, seven days a week, using the customer's own twelve-button touch dial telephone. Medicine also began widespread use of the computer in many areas other than research. Maintaining complete patient history records on computers provided a quick accessible data bank to physicians for diagnosis and patient treatment.

By 1990, the applications of automation had entered most aspects of life. In early 1990, the Governor of New York officially opened New York State's Employment Service statewide computerized job bank. Rapid matches between applicants and job openings was now possible anywhere in the state. Also that year, for the first time, the majority of all retail purchases in Central New York were credit transactions due to direct lines from merchants to area banks which allowed immediate determination of the buyer's credit rating. Also, forty-five (45) percent of all retail merchants in Central New York

were using computer time sharing systems to maintain their inventory control. Not even farming was immune to adopting automation. A continuing education study conducted in the fall of 1990 indicated that farmers had enrolled in continuing education in unprecidented numbers. Primarily, they were enrolling in business and data processing courses since they indicated their primary need was for skills as a business manager and they had to use computer to help run their business.

But like any other technological innovation, computer automation was not without negative impacts upon the society. The largest effect was on employment. At a White House Conference on Employment, in 1990, an economist from a nationally known "think tank" reported that after three (3) years of research, a study team she chaired had concluded that the rate of technological advancement, especially automation, was annually displacing an additional one (1) percent of the United States work force. At that same conference, the American Institute of Banking Director revealed that since 1975, the number of persons employed in banks declined by thirty-seven (37) percent due to the adoption by most banks of electronic funds transfers.

Increasing conversion to computer automation not only dislocated many workers, but it brought about a change in the workforce itself. In 1991, the United States Department of Labor announced that the average industrial worker in the United States had to be completely retrained every five (5) years because of the rapidity of technological change, particularly in the area of computer automation. That same year, the National Association of Manufacturers estimated that more than thirty (30) percent of the present positions in industry required some working knowledge of computers. This led to many training efforts. A number of industries with facilities in upstate New York formed several consortia to operate educational facilities devoted primarily to the retraining of their employees whose jobs had been eliminated by automation.

Fiscal pressures and pushes to greater productive efficiencies in all sectors of the economy accelerated the use of computers and automated technology. This was true in the public, as well as the private sector, of the economy. General budget appropriations for public services by state and county governments had remained at a relatively constant level in the years from 1988 to 1992. Most of the agencies turned to the use of computer technology and using para-professionals to meet the

ever increasing public demand for services within their budget constraints.

By 1995, low cost, high powered micro-computers were being used by all segments of the population. In that year, the United States Census Bureau reported that thirty-five (35) percent of American households owned a miniaturized computer which performed such routine tasks as family record keeping, running household appliances, controlling heating and air conditioning units, etc. A year later, National Homes, Inc. published promotional literature that indicated a small computer which could operate and regulate various systems (i.e., heating, electricity, water, etc.) was a standard feature on all but their most expensive homes.

By the end of the twentieth (20th) century, computer automation and communications technology provided access to a vast universe of information to the average United States citizen. Huge libraries and data banks could be accessed from one's home or many public centers through terminal type communications devices. One example is the Central New York Medical Information Center established in Cortland in 1999. Its main feature is a computer library of information tied into the National Medical Information Computer located in Washington, D. C. Although it has been an invaluable reference tool to the medical profession, its greatest use has been by the average citizen seeking information relative to his/her own health problems. One year later, the Oswego County Health Service opened the first self-diagnosis clinic in Central New York. It utilizes the most up-to-date technological equipment and advanced computer system. It can diagnose a patient's body indicators painlessly, and in a minute, give the client a diagnostic printout, much like the drive in automobile self diagnosis/tuning centers.

Although computer technology had some dislocating effects, its advantages became so widespread that no aspect of American life could function very well in the year 2000 without it.

The Emergence of the Public Service Economy

In the 1980's, the Federal government passed a number of programs designed to involve handicapped persons and youth in work related programs. In Central New York, each of the BOCES, the Syracuse City School

District and the three Community colleges announced, in the spring of 1981, that they had received special federal funds to employ year around young people and handicapped persons in public service activities.

This increased concern on the part of government and public agencies for the needs of a specific minority population reflected the fact that a multitude of groups with American society were requesting a wide variety of services previously not provided by government and public service agencies. The requests most often encountered by such agencies during this period of the 80's were mid-career/occupational counseling, child welfare assistance due to the increasing single parent homes and leisure-time counseling. Although the new and expanded public services such as youth employment and handicapped training were mandated by State and Federal laws, the responsibility for their implementation still remains the responsibility of agencies at regional and local levels - a responsibility many agencies found difficult to meet because of the tightening fiscal constraints put on them by taxpayers and local legislatures. Increased requirements for the accountability of their performance also created a problematic situation for most public and social service agencies.

However, the increased demand for the services provided by these agencies contributed toward a speed-up in the growth of this sector of the economy. By the end of the 1980's, the public service sector of the American economy had grown to the point where many observers considered it the major industry in the United States. Many of the occupations found in this public service sector also enjoyed increased visibility and prestige. Many positions in public and social service now required training and credentials at the level of either a two-year or four-year college education. New majors and curriculum designed to train the manpower needed by this sector of the economy began to emerge at this time within two-year and four-year colleges and universities.

The rapid advancement of technology, particularly in the form of computerization, also contributed to the growing professionalization of persons entering public and social service employment. The rapid advancement of computer technology beginning in the late 1970's had progressed to the point, where by the end of the 1980's, most on-going procedures as applicant eligibility determination, service and payments record keeping, case evaluations and diagnosis were all routine matters handled by various computer networks interconnecting the public and social service agencies providing a variety of services.

New types of public agencies employing large numbers of highly trained technicians also began to appear at this time. An example of such a new type of agency was the local Environmental Health Monitoring Units (EHMU's) whose purpose was to provide a wholistic approach to public health. The County Health Commissioner of Onondaga recently commented in a news interview that such units had made a great deal of progress in making people aware of the importance of ecology and preventive health measures. The number of EHMU's have increased by a factor of ten (10) over the last fifteen (15) year period and the number of persons employed in the health field have doubled.

These trends in public and social services continued well into the 1990's. However, by the mid-1990's, many municipalities and local governments found that they could not continue to financially support such activities and were facing fiscal crisises. Among the big five (5) cities within New York State, only the city of Rochester had not lost all financial borrowing power by the end of the 1990's. No one, however, at any level of government was able to formulate a solution to the dilemma of the public service economy.

The Future of Agriculture

Although the value shifts toward environmental protection began in the 1970's, and a few laws and regulations were passed (i.e., DDT ban), it was not until the early 1980's that the general concern for maintaining the quality of the environment and the production of food had a major impact on the agribusiness. By 1985, the concern about water and air pollution had increased to the point that the Federal Government enacted the Agriculture Environmental Projection Act. This law increased the mandates placed upon all agricultural operations concerning the use of fertilizers, water, pesticides, animal feed, etc.

Two major changes in farming operations occurred about the same time, partly due to the changes in environmental control mandates. The first was the increase in the number of larger, more mechanized farm businesses which increased the demand for highly skilled machine operators and farm workers. The second was the increase in the use of "off-farm" services, such as spraying, fertilizer spreading, harvesting, etc. In fact, the New York State Farm Bureau reported in April 1985 that the number of farms using "off-farm" services had increased twenty-five (25) percent since 1977.

Further adaptions in the agri-business occurred during the later half of the 80's decade. "U.S. Business News" reported in January of 1990 that a major trend was underway in the agri-business. Farmers were banding together into cooperative-like (intensified vertical integration) business operations from production to marketing. Along with increased mechanization and environmental protection mandates, large cooperative type farm businesses caused an accelerated decline in the independent family farm. The 1990 United States Census reported that the number of operating farms declined twenty-five (25) percent in the last ten (10) years although the average size of the farm had doubled. In Central New York, the number of farms has decreased by thirty-three (33) percent.

These changes in approaches to food production during the 80's necessitated a concomitant change in the knowledge and skills needed by farmers and other workers in the agri-business. A survey conducted by the New York State Continuing Education Division in the fall of 1990 reported that farmers had enrolled in unprecedented numbers in continuing education courses in the areas of business management, business law, financial planning, marketing and business applications of the computer. The survey report concluded that the farmer's priority needs were for skills as a business manager.

Farm employees, as well as farm owner-operators, also required specialized training and skills in chemistry, equipment maintenance technology, business management and ecology. This necessity for highly trained agriculture workers resulted in the state government requiring certification of certain types of farm workers in 1991. Farm workers now had to be graduates of training programs that provided the technical skills and knowledge needed to cope with the more and more complicated agri-business industry. The increase of highly technically trained workers on large farms led to rapid expansion of the Farm Workers Union, and their demands for pay scales, shorter work weeks and fringe benefits approached those offered to union members who worked in other types of jobs.

The need for greater expertise in the production of food increased the demand by those in farming for consultative assistance. In the spring of 1991, the SUNY College of Agriculture at Cornell announced that their requests from agriculturalists for research assistance had doubled since 1978. However, they were finding it extremely difficult to respond to the

requests since both state and federal aid to the University had been declining in recent years.

Thus, as the century drew to a close, the nature of the agri-business had changed substantially from the single family farm unit to a large integrated business enterprise. Farmers became skilled managers of complex food production and marketing businesses employing highly skilled agriculture specialists. Much of this change was necessitation by ecological concerns and laws, as well as cost-efficiency in the production and marketing of agricultural products.

The High Cost of Medical Education

This future set of events was triggered by the continued escalation of the cost of medical education. In early 1985, a New York Times article reported that the cost of medical education had reached an almost astronomical figure. Two major factors in the previous decade had contributed to this situation. First, the level of technical expertise required of graduates of medical programs, and second the rapid expansion and high cost of the technical equipment needed by universities in their preparation programs. Thus, long, very expensive preparation programs reduced the number of students enrolling in medical school and was a major contributor to the extremely high fees charged by MD's, Dentists, Anesthesiologists, etc.

As one response to this escalating cost for medical services, Congress passed a bill and the President signed into law the establishment of a National Health Insurance System to cover al United States citizens. The new system became operational on January 1, 1990. At the same time, a major shift toward preventative medicine became prominent. In late 1990, a study of the delivery of health care services by the National Institute for Health found that there was a significant decline in institutionalized health care from 1985 and a rapid growth in preventative medical clinics.

Major changes led to the following situation in Central New York. The Syracuse area Department of Labor office report on occupations and employment in 1991 indicated that the number of paramedics and other "physician substitutes" equaled the number of medical doctors employed in delivering primary health care.

In other service areas, the general economic press of the late 80's and early 90's caused changes in employment and work patterns. In 1991, a review of both the state and county governments' budgets for public services revealed that they had remained at the same dollar level for two (2) years. But the public demand for services had continued to rise at an ever increasing rate. The bulk of the increased demand for social services came from the greatly expanded senior citizen population. Not only was demand high from this large segment of the population, but they also held the expectation that government should assist them in leading a meaningful, dignified life. This led the service agencies to begin using para-professionals and computer technology to reduce operating expenses.

With the advent of National Health Insurance, greatly increased demand for all types of social services and public agencies facing tight fiscal constraints, legislation was passed by the federal government in 1993, that established limits on health care service and a maximum charge allowable for those services. Shortly thereafter, federal control of social welfare was also affected. The Department of Health, Education and Welfare announced, in December of 1993, that it had completed the regulatory guidelines for local government offices to administer the Uniform National Social Welfare Law.

In the early spring of 1995, Alabama became the last state in the union to enact a statue that determined entry level certification of all health service workers including nurses, technicians and paramedical personnel. In all these occupational areas, at least a two-year college degree is required, and for most, a four-year degree is mandated.

Also in 1995, local "environmental health monitoring" units were established in New York State which contributed to the increased emphasis on preventive medicine. The new health units increased the demand for technically trained people in the health field. Much of this demand was being filled by older citizens by the end of the century. Actuarial statistics published in 2000 indicated that the average life expectancy was eighty-five (85) years. The census, in that year, reported that more than fifty (50) percent of the people over age sixty (60) were working in completely different occupational areas than they did before age sixty (60). Many of the newly employed health care workers came from this population segment.

The Escalation Toward Corporate Occupational Education

The United States Senate and the House of Representatives passed a bill which authorizes over fifteen (15) percent of all federal vocational education monies to be used to fund on-the-job training programs in the private sector. Many of the governors and legislatures of states located in the northeastern part of the United States saw the new legislation as a major breakthrough in assisting them in rectifying the economic plight of this region of the country.

Following the lead of the federal government, the Governor and Legislature of New York began to formulate and discuss policies which could turn around the declining economic conditions of the state. The state's corporate tax structure was identified by all parties as a major contributor to the economic plight of New York. The Governor proposed and secured the Legislature's approval of a bill which provided that any corporation located within the State a twenty (20) percent tax allowance, if it demonstrated that it had increased the productivity of its employees by five (5) percent, or more as a result of the monies it had spent on financing employee training programs.

A number of national corporations with facilities located in upstate New York formed a consortium to regionally operate educational facilities devoted strictly to the training and retraining of their employees. As a result, the number of adults enrolling in such programs increased.

Encouraged by the business and industrial community's response to their initiative and wishing to maximize the limited state dollars available for occupational education, the State Legislature passed a law mandating that state monies could be used only to finance vocationally related programs, at either the secondary or post-secondary levels, which demonstrated that at least fifty (50) percent of the respective program's graduates had secured employment in a job directly related to their training. Many occupational education programs offered by the state's secondary schools and local community colleges had to close a substantial number of their occupational and technical programs because of their inability to meet the placement condition required in the state's recently passed Vocational Education Accountability Law.

Privately, many local school officials participating in BOCES and county legislators in counties sponsoring community colleges, felt relieved that the additional financial demand of the occupational and technical programs upon their revenue had declined. However, this was not their official public posture.

Taking advantage of the sudden void in occupational education programming and confident of their ability to demonstrate their graduate placement capability, proprietary and corporate sponsored vocational and technical schools expanded both in program offerings and in number. By 1995, they had doubled in number and enrolled over fifty (50) percent of all persons participating in occupational educational activities within New York State.

During the late 80's, the federal government continued to increase its allocation to occupational education. By 1990, the amount of money had doubled over that of fiscal 1978. Wishing to make the federal occupational education programs more efficient, the President of the United States announced at a recent news conference, that administrative responsibility for all federal programs pertaining to vocational education would be shifted from the Department of Education to the Department of Labor and subsumed under its CETA program responsibilities.

The Occupational Education Alternative

By the end of the 1970's, it was obvious to most observers that the continued trend of tuition cost for higher education was beginning to have an adverse affect on the accessibility of a college education to most of the American people. A number of trends beginning in the 1960's and 1970's were responsible for the situation.

Like most enterprises of this period, higher education was to feel the effect of the inflation experiences by the American economy. Annually, public school district and college administrators found themselves unable to cope with the dilemma of rising costs and shrinking enrollments. The expenditures of colleges and universities annually climbed, stimulated by the increased costs for capital resources and the wage and salary demands of both their professional and support staff.

Concurrently, the ending of the baby boom, and the inability of institutions of higher education to develop new student markets for their services fast

enough, caused many institutions to experience, for the first time in forty (40) years, a situation in which enrollment declined.

By the beginning of the 1980's, the situation developed to the point where many families, who had once dreamed of having a son or daughter obtain a college degree, had to accept the fact that a four-year college education was either beyond their means, or that they had to find an alternative path to achieve their objective. Hardest hit by this situation were the country's middle income families.

In a widely read article, in a 1982 issue of U.S. News and World Report, statistics showed that since 1978, there had been a ten (10) percent decrease in the number of middle income families who were able to afford to pay the yearly cost of the tuition of a four-year public or private college or university. The decrease in the number of middle-class children attending college was not completely caused by the cost of a college education. A shift in the value placed upon a college education by many parents and young people also contributed to the number of high school graduates not continuing their education at the post-secondary level. The inability of many college graduates to secure a job relevant to their education, or even secure a job at all, caused many individuals to reevaluate the values prevailing in the 1960's and 1970's, which place a high priority on a high school graduate obtaining some form of higher education.

This situation was readily apparent in New York State. Unlike some state university systems, the tuition of the colleges and university units comprising the SUNY system had been steadily increased during the 1960's and 1970's. While SUNY's tuition was still less than the private colleges and universities within the state, it had reached a level where public higher education in New York State was out of reach for the children of many New York State families, who in previous years would have probably attended a public institution. This situation was further compounded by the fact that New York State's economy was still declining in the 1980's, as it had been in the 1970's. In 1980, the number of jobs had declined by approximately ten (10) percent from the level of 1972. Many families could not afford to allocate an increasing percentage of their family's income that was required to finance the yearly costs of having a member of the family attend a four-year college.

As a result of this situation, it became increasingly popular for many parents to encourage their children to delay their plans for a college education, and become more interested in entering the job market upon high school graduation. In addition, realizing that a general high school program of study did not adequately provide the skills needed to compete in the job market, many parents and high school students began to see occupational and technical education as a viable educational alternative.

Several events occurred during this period which also contributed to this trend. The Board of Regents, in 1981, issued a position paper which lead to a renewed emphasis in the public system of the state on occupational and technical education. Joining with New York State's Department of Labor and Department of Commerce, the Regents stated that because of the poor existing economic climate within New York "...economic redevelopment was the priority objective of occupational and technical education at all levels of the state's secondary and post-secondary education system." This emphasis on occupational/technical education was reaffirmed in 1987 by the Regents announcement that along with teaching basic skills, "...the major educational goal of New York State's schools will be the development of the attitudes and values necessary for students to become productive contributors to and intelligient consumers of New York State's business and industrial system.

Both the New York State Legislature and Governor took actions during the decade of the 80's which stimulated the state's occupational and technical education capability. With the intent that the limited state monies available to finance occupational/technical education not be wasted, the Legislature in the 1982 session mandated that state monies could only be used to finance such programs, at both the secondary and post-secondary level, if the particular school or institution could demonstrate that at least fifty (50) percent of the graduates from the program could secure employment in a job directly related to their training.

While at first strongly opposed by the state's occupational education establishment, it soon became clear that agencies which eliminated programs whose graduates had poor placement records, were more likely to have increased public support and little difficulty in recruiting students for its programs. Many potential students of occupational/technical programs were less reluctant during this time than had been similar students in the 1960's and 1970's to enroll in these programs. They now had some assurance that the time they spent learning an occupational skill would not be wasted by their inability to secure a relevant job.

A bill supported by the Governor and approved by the State's Legislature, intended to stimulate the state's economy, also contributed to a renewed interest in New York in occupational/technical education. In 1982, the Governor of the State signed into law a bill which allowed any corporation, located within the State, a twenty (20) percent tax allowance, if it could demonstrate that it had increased the productivity of its employees by five (5) percent or more through monies it used to finance employee training programs. The initial impact of this bill was that many businesses and industries were encouraged to contract with local educational agencies who had the capability to provide employee training programs. This cooperative arrangement became the general norm for businesses and industries native to Central New York. However, many national and multi-national corporations chose to provide their own training programs for their employees outside of the State Education Department's occupational education system. This "self-help" approach was further stimulated by the fact that in 1980, the United States Congress had passed legislation which provided that at least fifteen (15) percent of all federal vocational education monies had to be used to fund on-the-job training programs in the private job sector. Taking advantage of this legislation, many New York State firms formed cooperative training programs among themselves. By 1987, a number of national corporations with plants located in upstate New York had formed a consortium which operated regional facilities devoted strictly to the training and retraining of their new and older skilled and technical personnel.

By the end of the 1980's, the number of persons, both young and old, who were participating in occupational and technical training, had markedly increased. A 1987 survey of high school pupils across New York State, revealed that over eighty (80) percent of them had spent from twenty (20) to twenty-five (25) percent of their school day engaged in some form of occuaptional educational activity. An analysis of that same year's enrollment in all the occupational education agencies in the Central New York region, showed that since 1976, the proportion of the adult population enrolled in such programs had doubled.

The financial support received by New York State from the Federal government's Office of Management and Budget revealed that the total amount of federal monies allocated to occupational education

under all federal programs (i.e., CETA, VEA, voucher) had doubled since fiscal 1978.

As the 1990's began, the shift to providing occupational education through programs offered by business and industry continued. In 1994, almost forty (40) percent of all persons participating in occupational education activities within New York State were doing so through programs offered by industries and manufacturers. The current 1995 Annual Educational Summary published by the New York State Education Department showed that the number of proprietary and corporate training schools in New York State had doubled over the last twenty (20) years. Thus, as the century drew to a close, education for work, both in the public education system and the private economic system, became the primary forms of schooling.

Reestablishing Economic Leadership

In the early 1980's, the economic indicators within New York State showed that the declining level of economic productivity in business and industry was rapidly approaching the crisis mark. Recognizing the urgency of the situation, the executive branch of the state's government took several steps in attempting to reverse this trend towards the decline of New York State's economic position, which began in the 1970's. Receiving prompt cooperation of the state's legislature, the Governor of New York State signed into law a bill which allowed any corporation located within the State a twenty (20) percent tax allowance if it could demonstrate that it had increased its productivity by five (5) percent or more as a result of the monies it spent to finance employee training programs.

The debate which had resulted from the Governor's strong campaign to obtain passage of the bill by the New York State Legislature focused the attention of not only the residents of the state, but of people throughout the United States, on the relationship between economic growth and education. Led by the Congressional delegations from five (5) industrial states in the East and Midwest, both the United States Senate and House of Representatives passed a bill which authorized over fifteen (15) percent of all federal vocational education monies to be used to fund on-the-job training programs in the private job sector. Simultaneously, the New York State Board of Regents issued a position paper, jointly with New York State's Department of Labor and Department of Commerce, which identified "economic

redevelopment" of New York State as the priority objective of occupational/technical education at all levels of the state's system of secondary and post-secondary education.

These policies greatly effected enrollments in occupational and technical programs at all levels of New York State's educational system. A survey taken prior to 1990 of high school pupils across New York State revealed that over eighty (80) percent of them spent from twenty (20) to twenty-five (25) percent of their school day engaged in some form of occupational education activity. Increasing numbers of adults also enrolled in occupationally related programs offered by public education agencies. In Central New York, an analysis of the enrollment in all the occupational education programs offered by educational agencies during the late 1980's, showed that since 1976, the proportion of the adult population enrolling in such programs had doubled. This trend had been partially caused by the fact that a number of industries with facilities located in upstate New York had formed several consortia to operate educational facilities devoted primarily to the retraining of their employees whose jobs had been eliminated by automation or to the training of unemployed members of minority groups.

Throughout the period of the late 1980's, the Board of Regents continued to emphasize publicly, the educational priority of occupational education within New York State's schools. Through their Commissioner of Education, they announced that along with teaching the basic educational skills, the major educational goal of New York State's schools was to be the development of "...the necessary attitudes and values in their pupils to be productive contributors to the State's business, industrial, and economic climate...."

The enrollment in post-secondary institutions within the state also increased during this period of the late 1980's. These increases were caused equally by occupational education policy at both the state and federal level of government, the changing nature of the occupational skills required of workers, and various occupational shifts within the economy. An issue of CETA News during this period carried an article explaining that over one-third (1/3) of the occupations, which in the 1970's required a high school diploma for entry, now have an associate degree as an entry level requirement for employment.

No where was this more apparent than in the field of data automation. The National Association of Manufacturers estimated that more than thirty (30) percent of the existing positions in industry and business required some working knowledge of computers. Almost forty-five (45) percent of all retail merchants in the Central New York area use computer time sharing systems to maintain their inventory control. The United States Department of Labor announced that the average industrial worker in the United States must be completely retrained every five (5) years because of the rapidity of technological changes, particularly in the area of automation and computerization.

Shifts within the economy, both state-wide and nationally, also contribute to the continuing focus on occupational and technical education as one means to assist in maintaining economic viability. A study committee of economists found that since 1978, heavy manufacturing has declined in five (5) northeastern states (i.e., New York, New Jersey, Pennsylvania, Delaware, Massachusetts), while light manufacturing, commerical, service industries, and research/development activities have increased in economic importance within the region. The nature of these industries were such that their work forces were typically very susceptible to the rapid technological characteristics of this innovation. At a White House Conference on employment, an economist from a nationally known "think tank" reported that after three (3) years of research, a study team she heads had concluded that the present rate of technological advancement was annually displacing an additional one (1) percent of the United States work force. Wishing to lessen the impact on employment of such trends, Congress and the President continued to annually increase federal monies earmarked for occupational and technical education. A study by the federal government's Office of Management and Budget revealed that the total amount of federal monies allocated to occupational education under all federal programs (i.e., CETA, VEA, voucher) had doubled since fiscal 1978 during this period.

Several trends and events contributed to the economic re-emergence of New York State, as well as the mid-Atlantic region, prior to the early 1990's. The income of most members of the New York State labor force annually increased. Although effected by inflation, a recent report by the New York State Employment Service indicated that the average hourly wage of residents of New York State was $15.00 per hour (in 1977 dollars).

The continued cooperation between state economic development efforts, whose beginning was symbolized by the work of such programs as that of the Appalachian Regional Commission, also assisted in improving the economic climate of New York State. In the mid-1980's, representatives from six (6) northeastern states (i.e., New York, New Jersey, Pennsylvania, Connecticut, Massachusetts, and Rhode Island) jointly established an agency called NEEDS (Northeastern Economic Development Secretariat) to better coordinate the economic development activities within the region formed by these states. The activities of this agency has contributed to the improved economic conditions of these states.

These trends continued to grow in the mid-1990's. Encouraged by the existence of increased monies for occupational education, educational programs to train technical manpower outside the formal educational system increased, as did the enrollment in occupational education programs of all types. The 1995 Annual Educational Summary, published by the New York State Education Department, showed that the number of proprietary and corporate training schools in New York State had doubled since 1975. Recent statistics collected by the New York State Education Department show that almost forty (40) percent of all persons participating in occupational education activities within New York State, are doing so through occupational education programs offered by industry and manufacturers.

Greatly contributing to maintaining the important place of occupational education in overall education priorities, is the ever changing nature of the economy's manpower needs. The preface to the current Dictionary of Occupational Titles contains the statement that almost thirty (30) percent of all job titles currently listed in the publication are new and/or emerging occupations since the last date of publication.

Few public officials questioned the desirability of public policy or financial support for occupational education. In fact, there had been growing sentiment for streamlining the administration of occupational education programming to maximize its effectiveness. The President of the United States, at a recent news conference, announced that the administrative responsibility for all federal programs pertaining to vocational education would be shifted from the Department of Education to the Department of Labor and subsumed under the Department of Labor's CETA program responsibilities. Thus, through direct

governmental intervention, the role of occupational education in economic planning gained equal priority with taxation and governmental regulations in combating the nation's economic problems and greatly assisted New York State"s economy.

Meritocracy In Employment

A major United States Supreme Court decision, in the early 1980's, was a significant event and enhanced the occurrence of a number of events that followed. Although not a prime causal factor, the court decision reinforced trends in the economy, technology, politics, and even occupational education that occurred between 1978 and the year 2000. The Supreme Court decision was a seven (7) to two (2) vote that affirmed the principle that an employer had to hire a person applying for a job primarily on his or her individual merit in fulfilling that job, rather than on consideration of the individual's membership in an economically discriminated against minority group.

Partially to counteract the court decision by providing greater skill training to recently hired minorities, the United States Congress passed a bill which authorized over fifteen (15) percent of all Federal vocational education monies for use to fund on-the-job training programs in the private sector. This bill is also backed strongly by organized labor in order to insure that their members would receive the necessary skill training for job advancement. Shortly thereafter, the effects of rapid technological advancement became evident in the employment picture. Around the year 1990, a number of major announcements at the Federal level occurred. At a White House conference on employment, an economist from a nationally known "think tank" reported that after three (3) years of research, a study team she heads concluded that the present rate of technological advancement is annually displacing an additional one (1) percent of the United States work force. Shortly thereafter, the United States Department of Labor announced that the average industrial worker in the United States must be completely retrained every five (5) years because of the rapidity of technological change, particularly in the area of automation and computerization. Also during that year, the National Association of Manufacturers estimated that more than thirty (30) percent of the present positions in industry and business required some working knowledge of computers.

This rapid technological advancement has required employees of business and industry with greater degrees of knowledge and skills than was previously true of the work force prior to 1980. Thus, both the meritocracy decision of the United States Supreme Court and the change in the knowledge and skills required for employees has led to the enhanced requirement for employee certification. In late 1990, an issue of the CETA News carried an article explaining that over one-third (1/3) of the occupations, which in the 1970's required a high school diploma for entry, now have an associate degree as a requirement for employment.

These changes were reflected in the skills required of the work force in the early 1990's. For example, almost forty-five (45) percent of all retail merchants in the Central New York area use computer time sharing systems to maintain their inventory control. Another interesting statistic in the early 1990's is found in the New York State Department of Labor's employment statistics which show that females constitute twenty-five (25) percent or more of all persons employed in technical occupations. The shift to a more highly educated, technically oriented work force has caused a mixed employment picture in both New York State and the nation. The need for matching people with jobs has become even more pressing. Thus, the New York State Employment Service officially announced the opening of a statewide computerized job bank to match employees with experience and training with available technical jobs in both the private and public sector.

This search for highly trained, skilled employees pushed wages to an all time high. A New York State Employment report in 1991 indicated that the average hourly wage of residents of the state is $15.00 per hour (in 1977 dollars). While well trained employees are receiving adequate wages, an increasing percentage of the population became unemployed or partially employed. Pressure was brought on the government to address unemployment as a top priority. In response, the United States Congress approved and the President signed a bill which provides every American with a guaranteed annual income at the Internal Revenue Service's determined level of sustenance, based upon the number of dependents in the family units, etc.

Another outgrowth of this need for skilled employees, in addition to increased wages and provisions for the unemployed, is an emphasis on vocational or technical training. In 1992, a study published by the Federal Government's Office of Management and Budget revealed that the total amount of Federal monies allocated to occupational education under Federal programs (i.e.,

CETA, VEA, voucher) has doubled since 1978. Also, in that same year, the New York Legislature passed a law which mandates that State monies can only be used to finance vocationally related programs, at both the secondary and post-secondary levels, which can demonstrate that at least fifty (50) percent of the respective program graduates secure employment in a job directly related to their training. An analysis of the same year's enrollment in all the occupational education programs offered by educational agencies in the Central New York region show that since 1976, the proportion of the adult population enrolled in such programs has doubled.

This great interest on the part of the adult population in occupational education has led many private agencies into the training market. In the early 1990's, a number of national corporations with facilities located in Upstate New York, formed a consortium to regionally operate educational facilities devoted strictly to training and retraining their employees. This concern and need for technical occupational skills in the work force brought about some changes in public educational systems in New York State, as well. At the same time private schools were developing and expanding occupational training programs, the Board of Regents in New York State announced that, along with teaching basic educational skills, the major educational goal of New York State schools would be the development of the attitudes and values necessary for students to become productive contributors of New York State's business, industrial and economical climate. That same year, a survey of high school pupils across New York State revealed that over eighty (80) percent of them spent from twenty (20) to twenty-five (25) percent of their school day engaged in some form of occupational education activity.

Economic development became not only a concern of the educational establishment, but the real lead from the private industrial community. In 1993, representatives from six (6) northeastern states (i.e., New York, New Jersey, Pennsylvania, Connecticut, Massachusetts, Rhode Island) jointly established an agency called the Northeastern Economic Development Secretariat (NEEDS) to better coordinate the economic development activities within the region.

The trends of the early 1990's continued on into 1995 through 1998. Rapid technicalization of the occupational fields continued. In fact, the preface to the 1997 issue of the Dictionary of Occupational Titles states that almost thirty (30) percent of the job titles listed are new and/or emerging occupations,

since the 1990 issue. The continued expansion of occupational education into the private sector occurred. The 1997 issue of the Annual Education Summary, published by the New York State Education Department, showed that the number of proprietary and corporate training schools in New York State has doubled since 1977. State Department statistics collected in that same year also showed that almost forty (40) percent of all persons participating in occupational education activities within the state are doing so through occupational education programs offered by industries and manufacturers.

The aforementioned changed occurring in the last two (2) decades of this century brought much pressure for public officials to change the focus of governance of vocational education. Thus, in 1998, the President of the United States announced that the administrative responsibility for all Federal programs pertaining to vocational education would be shifted from the Department of Education to the Department of Labor and subsumed under the Department of Labor's CETA program responsibilities. This was viewed by both labor organizations and the private business management as a victory.

By the close of the century, there was an upsurge in the economy with much of the means of production highly automated. A smaller work force was needed, however, with protection for the unemployed provided by the guaranteed annual income. Also, early retirements became the norm, rather than the exception, and in 1999, the United States Census Bureau announced that the over sixty (60) year old segment made up one-quarter (1/4) of the total population, with almost ninety (90) percent of them receiving Social Security benefits.

Public and Private Reaction To Work Value Shifts

In the early 1980's, the social values in the United States had shifted so far from the traditional Protestant Ethic of hard work and frugality, that a national survey conducted by Psychology Today estimated that over sixty (60) percent of those employed derived their main satisfaction from leisure, rather than from their work activities. Work, though important for income purposes, had become something to be engaged in only when one had to secure resources to follow one's leisure pursuits.

This value shift had a negative effect upon economic productivity and led to both public and private efforts to re-establish economic development and a productive work attitude. In New York State, the Governor signed a bill into law in 1985, which allowed any corporation located within the State a twenty (20) percent tax allowance if it could demonstrate that it had increased its production by five (5) percent or more, as a result of the monies it spent to finance employee training programs. At the same time, the New York State Board of Regents issued a position paper jointly with the New York State Department of Labor and Department of Commerce which stated that "economic re-development" of the state was the priority objective of occupational/technical education at all levels of the state's system of secondary and post-secondary education.

The shift in traditional values, the establishment of tax incentives to industry for worker retraining and the attempt to place greater stress on occupational education by public officials all occurred when fewer middle income families were sending their children to college. A U.S. News and World Report article contained statistics that showed a ten (10) percent decrease between 1978 and 1985 in the number of middle class families who could afford the yearly tuition.

In this period, the general economic troubles led to the United States Congress passing a bill, signed by the President in 1990, that guaranteed an annual income to every American at the Internal Revenue Service's determined level of sustenance based upon the number of dependents in the family units. Another factor contributing to economic difficulties in the late 1980's was the increased scarcity of cheap energy supplies. The New York State Institute of Economics and Industrial Development released figures which showed that the cost to the average New York State manufacturer for the energy necessary to maintain a minimal level of production had increased in 1990 by three hundred (300) percent from the cost in 1972.

Technology had continued to advance from the 1970's to the 1990's and could only be objectively appraised as a mixed blessing. While freeing more and more workers from monotonous routine tasks, it also freed many from jobs entirely. At a 1990 White House conference on employment, an economist from a nationally known "think tank" reported that after three (3) years of research, a study team she headed had concluded that the present rate of technological advancement was annually displacing an additional one (1)

percent of the United States work force. Although many were losing their jobs, those who were working in New York State were averaging $15.00 per hour since their jobs were more technical in nature. An example of the increased technological nature of work was a report in the Syracuse "Herald Journal" in January 1991 that stated that forty-five (45) percent of all retail merchants in the Central New York area used computer time sharing systems to maintain their inventory control. At the national level, the United States Department of Labor announced that same month, that the average industrial worker in the United States must be retrained every five (5) years because of the rapidity of technological change, particularly in the area of automation and computerization.

The economy in the Northeast, in general, and New York State, in particular, had shifted by 1990 from its former preeminence of manufacturing to other economic bases. A study committee of economists found that since 1978, heavy manufacturing had declined in five (5) northeastern states (i.e., New York, New Jersey, Pennsylvania, Delaware, Massachusetts), while light manufacturing, commercial, service industries and research/development activities had increased in economic importance within the region. Even though a technological advancement was occurring, causing a shift in the economic base, representatives from six (6) states (i.e., New York, New Jersey, Pennsylvania, Connecticut, Massachusetts, Rhode Island) jointly established an agency called the Northeastern Economic Development Secretariat (NEEDS) to better coordinate the economic development activities in the region to counteract the increase in unemployment. To also counteract unemployment, the New York State Employment Service opened a statewide computerized job-bank at a public ceremony officiated by the Governor. This occurred in 1991.

The advancement of technology, decline in traditional economic base, high unemployment and the shift in public attitudes and values about work led to a great emphasis at both the state and national level on occupational education in the early 1990's. First, the Board of Regents of New York State announced that along with teaching basic educational skills, the major educational goal of New York State schools would be the development of the attitudes and values necessary for students to become productive contributors to the state's business, industrial and economic climate. During that same year, the New York State Legislature passed a law which mandated that state monies could be used only to finance vocationally related programs at both the secondary and post-secon-

dary level which could demonstrate that at least fifty (50) percent of the respective program's graduates secured employment in a job directly related to their training.

At the Federal level, a study in 1992 by the government's Office of Management and Budget revealed that the total amount of money allocated to occupational education under all Federal programs (i.e., CETA, VEA, voucher, etc.) had doubled since fiscal 1978. The results were increases in occupational education enrollments at all levels. The December 1992 issue of CETA News carried an article explaining that over one-third (1/3) of the occupations, which in the 1970's required a high school diploma for entry, in the 1990's, required an Associate Degree for employment. This led to the doubling of the adult population enrolled in all continuing occupational education programs and an even higher proportion in post-secondary institutions. At the high school level, the Occupational Education Reporting System statistical summary in 1993 indicated that over eighty (80) percent of the ten (10) through twelve (12) population of students spent from twenty (20) to twenty-five (25) percent of their school day engaged in some form of occupational education activity.

As the century drew to a close, the aforementioned trends continued and led to a reduced work week to help mitigate against unemployment. In 1995, a New York State Department of Labor study found that over fifty (50) percent of all employed persons residing in the state worked approximately thirty (30) hours per week. This rapid change in occupational obsolescence was noted in the preface to the 1997 issue of the Dictionary of Occupational Titles which stated that almost thirty (30) percent of the job titles listed were new and/or emerging occupations since the 1990 issue.

The increased emphasis on and monies allocated to occupational education led to increased proprietary schools and business involvement in occupational education. The 1995 Annual Educational Summary, published by the New York State Education Department, indicated that the number of proprietary and corporate training schools in New York State had doubled since 1978. The report also showed that almost forty (40) percent of all persons participating in occupational education activities in the state were enrolled in programs offered by private business and industry. Thus, education had made a great transformation from the classical academic

orientation to the more pragmatic focus upon preparation for the world of work in the work place. This refocusing of public education along with other economic development activities and government intervention had some success in rehabilitating the economy of New York by the end of the century.

Education For Work

In the early 1980's, a shift in the public's beliefs about the purpose and value of formal education occurred. A Gallup Poll conducted in 1985 noted that there was increased support for occupational education and a concurrent decline in support for general/liberal education. The report concluded that parents seemed to want schooling to prepare their youngsters for securing worthwhile employment.

This general shift in beliefs about education was occurring at the same time that the nature of jobs available in the market place was changing. In the agricultural area, for example, the United States Agriculture Department, in early 1985, announced that the increase in the number of larger, more mechanized farm businesses had increased the demand for highly skilled machine operators and farm workers. A Labor Department announcement in that same year stated that thirty (30) percent of all the job titles listed in the latest Dictionary of Occupational Titles were new and/or emerging occupations since the 1977 publication.

Women had greatly increased their numbers in occupations that were at one time traditionally occupied by males. The New York State Department of Labor's employment statistics in 1990 reported that females constituted twenty-five (25) percent or more of all persons employed in technical occupations. The increase of female workers brought about equality in income. By 1995, New York State Department of Labor statistics showed that, unlike the situation of the 1970's, there was no pay differential between a male or female employee holding a comparable job.

The need for occupational education and worker retraining continued to increase during the decade of the 80's. In 1990, the United States Department of Labor announced that the average industrial worker in the United States must be completely retrained every five (5) years because of the rapidity of technological change, particularly in the area of automation and computerization.

Two other factors occurred in conjunction with the increasing technological nature of work. Certificates for many occupations became mandated. For example, the increased technical skills required of agricultural employees resulted in the state government, in 1991, requiring certification of certain types of farm workers. Shortly thereafter, with Alabama enacting licensing requirements, all fifty (50) states had statutes determining entry level certification of all health service workers, including nurses, technicians, and paramedical personnel. In all health occupational areas, at least a two-year college degree was required and for most occupations, a four-year degree.

The second concurrent event was increased unionization of workers, especially in areas traditionally non-union. The United States Labor Department, in its 1991 annual report, indicated that most farm employees had become union members. The following year, the Agricultural Workers Union, in their contract negotiations, demanded pay scales, shorter work weeks and fringe benefits equal to that of the United Auto Workers.

By the end of the century, most sectors of the economy required highly, technical trained workers. These skilled workers were also required to periodically attend training programs for continued skill updating. Education for work had become the primary focus of the educational institutions reflecting the values of the majority of the taxpayers.

FUTURE TRENDS AND THEIR IMPLICATIONS

FOR

OCCUPATIONAL EDUCATION

The charts which follow contain the trends which were identified as being prevalent in many of the scenarios developed during this study. Also listed on each chart are the implications for occupational education, in general, and the Occupational Education Planning Region #9, in particular, forecast from the future trends.

The process of identifying significant future trends impacting occupational education, such as those described in this report, is an on-going one. The existing scenarios, as well as those which may be developed at a later time, are rich enough in their policy implications to warrant continued analysis of probable future trends on occupational education. As factors are identified in the current environment which relate to the events which have been forecast on the probable trends, these will be used to update the trend analysis and revisions in policy implications and will be presented to the Executive Planning Committee for their policy deliberations.

TREND CHART I

LABOR FORCE

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Change in occupational structure of economy; declining number of jobs in agriculture, construction, industrial operatives; increases in public service, para-professional	1. Decrease in the number of programs needed to train students in traditional trade and technical occupational areas (i.e., construction, machine operative, agriculture)
2. Rapid increase in the emergence of new occupations; (i.e., telecommunications operator, genetic counselor, recreation therapist, etc.)	2. Increase in the number of programs training people as para-professionals in variety of occupational areas (i.e., health, social service, public service, etc.)
3. Greater percentage of women in labor force; less gap in the pay differential with men; employed routinely in jobs previously male dominated	3. Process for curriculum and program planning and development has to be more responsive to ever changing labor market needs; restructured curriculum in modular format for ease of modification and student access
4. Increased emphasis on employment being based upon merit, not affirmative action	4. Greater emphasis on student career counseling, especially for women in non-traditional occupation areas; increasing emphasis on lifelong learning
5. Increased rate of technology advancement displacing greater numbers of employed persons in a wider variety of occupational fields; continued expansion of the demand for job retraining of adults	5. Less need for special affirmative action type occupational preparation programs; more emphasis on job competencies, regardless of age, race, sex, etc.
	6. Expansion of adult continuing occupational education programs in conjunction with employers; more on-site training programs both with and without academic credit

TREND CHART II

SOCIAL AND PERSONAL ATTITUDES AND VALUES

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Increasing number of people rejecting economic growth and material acquisition as a primary goal of society	1. More interest on the part of adult students on continuing education for hobby or self-fulfillment purposes
2. People deriving greater satisfaction from leisure pursuits than from work, and the young, especially, are less motivated to seek material rewards for achievements.	2. Greater difficulty in finding sufficient number of job openings for new entrants into the labor market
3. Increasing desire and ability of people to control one's own well-being (i.e., preventative health measures, growing own food, use of professionals for advice, rather than decision making); less reliance on institutions for all services	3. Greater accountability by public institutions including schools and colleges in demonstrating the value of educational services provided to their clients
4. Increasing push for job security and/or longevity by workers; much greater number of partial, or semi-retirement	4. Countervailing pressures from workers and unions to reduce occupational preparation programs for youth
5. Increasing concern for consumer/client protection from mal or poor service of professionals and institutions	

TREND CHART III

EDUCATIONAL POLICY AND PRACTICE

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Increasing pressure for consolidation of occupational education at secondary and post-secondary levels into a unified service delivery system	1. Expansion of occupational education program enrollments in general, but less in public education and more in private sector
2. Increasing categorical funding of occupational education by Federal government; likelihood that administration of programs and funds will be shifted to the Department of Labor	2. Governance of occupational education shift to the Department of Labor from United States Department of Education
3. Increased percentage of LEA revenues come from state aid	3. Greater control over occupational education by the Federal government
4. Increasing support for "on the job" training approach in the private employment sector supported by tax incentives and federal funding	4. Smaller percentage of total Federal dollars for occupational education will be directed to public educational agencies.
5. Increasing number of private/proprietary schools providing occupational education in New York State and increasing enrollment of adults in these programs	5. More consortium and cooperative training arrangements between public occupational education agencies and the private sector (i.e., extension of community college type programs into private industry)

TREND CHART IV

DEMOGRAPHIC CHANGES

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Growth in the number and percentage of older persons composing the population; increased life expectancy of the average United States citizen 2. Decline and/or stabilization of the birth rate 3. Revitalization of urban areas 4. Continued net out migration of people from New York State	1. More competition by educational agencies for public monies due to increasing demand for services to the elderly (i.e., health, transportation, etc.) 2. More conservative attitude towards the purposes and goals of education and the importance of certain educational services resulting in less public support for education 3. Declining enrollments in secondary and post-secondary occupational education programs by adolescents and young adults 4. Stabilized or retarded rate of enrollment decline in occupational education programs offered by city school districts 5. Increasing job openings in construction industry

TREND CHART V

TECHNOLOGICAL CHANGES

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Wide-spread use of computers and automated devices for a variety of routine tasks (i.e., banking transactions, inventory control, medical records, control of home utilities); expotential, almost explosive, growth in the number of micro computer use, of which the average individual will have access to both at work and at home; massive computer networks dedicated to all types of uses (i.e., libraries - OCLC, education - EPSIS, etc.)	1. Greater use of the computer by faculty and students as a teaching/learning tool (i.e., CAI, CMI, etc.)
2. Development of new materials in a variety of fields (i.e., prosthetics, constructions, etc.)	2. Need to train faculty in the use of the computer as an instructional tool
3. Use of advanced technologies for building construction; pre-fabrication component made by synthetics	3. Need to incorporate knowledge of computers and automation into practically all occupational education and technical curriculums and programs at both the secondary and post-secondary level
4. Emergence of new technologies arising from the research, development, and adaption of new energy sources; increase use of animal and vegetable waste for fuel production	4. Increased need by OCTOC agencies to obtain computer equipment and software for instructional purposes and use
	5. Need to develop new programs to train manpower to meet the wide-spread adoption and automation; specific training needs will be in all areas, including development, manufacture, operation and service
	6. Need to develop new programs to train manpower for newly emerging technologies, particularly in the field of materials and energy development and use.
	7. Need to continually retrain existing occupational and technical education instructors in the new technology and their applications
	8. Need to expand retraining programs for the older employees of local industries in the applications of new and emerging technologies

TREND CHART VI

ECOLOGY

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Greater interest by the public on the proper use of land; increased emphasis on land use control and zoning 2. Increased trend towards a "smaller is beautiful" philosophy which retards the use of basic resources; increased scarcity of practically all basic resources (i.e., metal, fossil fuels, etc.); with resurgence in importance and use of some older resources, such as coal, wood, etc. 3. Increased environmental mandates from government at all levels; an era of ever-growing concern about the quality of the environment and ecology in general; growing trend toward smaller, less powerful fuel efficient automobiles; less willingness of government at all levels to sanction technologies and technological devices which potentially are environmental pollutors; establishment of environmental health monitoring units 4. Continued growth in food, productivity per acre using new insecticides and fertilizers, which are ecologically "safe"	1. Expanded number of technical curricula and programs in environmental/ecological occupational fields leading to expanded and new enrollments at the post-secondary and adult levels (i.e., waste treatment management, environmental assessment technology, etc.) 2. Curriculum modifications in programs training students for jobs in occupational fields, which are potentially pollutors of the environment (i.e., automotive, construction, etc.); more ecology education infused into all occupational and technical education programs 3. Greater emphasis on parsimonious use of materials incorporated into occupational and technical education programs 4. Greater emphasis on educating students in the use of appropriate (smaller scale) technologies 5. Increased emphasis in health service occupation curricula on the relationship between the environmental ecology and the individual's health

TREND CHART VII

PUBLIC AND SOCIAL POLICY

TREND	IMPLICATION FOR OCCUPATIONAL EDUCATION IN OCTOC REGION
1. Increased percentage of public funds allocated to support existing, rather than new, social welfare type programs (i.e., social security)	1. More competition for public monies among all types of public agencies including education
2. More emphasis on social and public service which benefit the older rather than young segments of the population	2. Increased mandated reporting requirements which all educational agencies will have to meet; need at local level for even better data and information bases; expanded bureaucracy at State and Federal level; more use of the results of program evaluation for decision-making with agencies held more accountable for achieving identifiable objectives/results
3. Leveling off, if not in-fact a decrease, in the amount of public funds allocated per capital — for all public services in the state	3. More emphasis on allocating a large portion of available educational dollars to basic skills and occupational/technical education
4. Creation of new national social service programs (i.e., National Health Insurance, National Social Welfare, etc.); increased control and regulation of social services at the federal level	4. Increase need to train para-professional in all public service sectors; expansion of programs whose objectives are so designed
5. Passage by the Federal government of a guaranteed annual income	5. Great emphasis, if not requirements, that public educational agencies work cooperatively with private business/industry and governmental agencies, in planning and implementing economic redevelopment projects
6. Increased accountability demanded of all public agencies, including public schools and colleges, for the results they achieve; more mandated reporting to public policy making bodies	
7. Increased emphasis by all types of New York State policy making bodies (i.e., Executive Legislative, Board of Regents, etc.) on economic redevelopment of the state as a primary goal	

APPENDIX A

CROSS IMPACT MATRIX

RESPONSE FORM

CROSS IMPACT MATRIX

RESPONSE FORM

Compare the event listed in the row below to each of the events listed in the columns. Determine the magnitude, in your considered judgement, of the impact of the row event on the occurence of the column event. Using the scale +3, +2, +1, 0, -1, -2, -3 place the value in the blank cell.

	1. guaranteed annual income	2. Psychology Today, 60% derived more satisfaction from leisure	3. 35% of American households own a minaturized computer	4. number of jobs has declined	5. capital investment has dropped by 40%	6. corporation 20% tax allowance	7. technological advancement displacing 1% of the U.S. work force	8. opened New York State's Employment Service	9. Dictionary of Occupational Titles 30% of all job titles are new	10. Will not grant a patent to contribute to environmental pollution	11. over 60 year old segment is almost 1/4 total population	12. The President has just signed the bill passed by Congress to establish WHTS	13. federal legislation has established limits maximum charge	14. major decline in institutionalized health	15. number of para-medics and other "physician substitutes" equals medical doctors	16. cost of medical education has become extremely expensive	17. 50 states now have statutes determining entry level certification	18. preventive medicine has made a great step forward	Page One Total
1. The United States Congress approved and the President signed a bill which provides every American with a guaranteed annual income at the IRS determined level of sustenance, based upon the number of dependents in the family units, etc.																			
2. Psychology Today, a prominent magazine, reports in a lead article on changing work values that an estimated 60% of the persons employed derived more satisfaction from leisure rather than work activities.																			
3. The United States Bureau of the Census reports that almost 35% of American households own a minaturized computer which performs such routine tasks as family record keeping, running household appliance, controling heating sources, etc.																			
4. The number of jobs in New York State has declined by approximately 15% from the level of 1972.																			
5. The New York State Commissioner of Commerce announced that the capital investment by business and industries located in New York State has dropped by 40% from the level of 1970.																			
6. The Governor of New York State has signed into law a bill which allows any corporation located within the state a 20% tax allowance if it can demonstrate that it has increased its production by 5% or more as a result of the monies it spent to finance employee training programs.																			
7. At a White House Conference on Employment, an economist from a nationally known "think tank" reports that after three years of research, a study team she heads has concluded that the present rate of technological advancement is annually displacing an additional 1% of the U.S. work force.																			
8. At a recent public ceremony in Albany, the Governor of New York State officially opened New York State's Employment Service state-wide computerized job-bank.																			
9. The preface to the current Dictionary of Occupational Titles contains the statement that almost 30% of all job titles currently listed in the publication are new and/or emerging occupations (since the last publication in 1978).																			
Page One Total																			

CROSS IMPACT MATRIX

RESPONSE FORM

Compare the event listed in the row below to each of the events listed in the columns. Determine the magnitude, in your considered judgement, of the impact of the row event on the occurrence of the column event. Using the scale +3, +2, N, 0, -1, -2, -3 place the value in the blank cell.

	1. guaranteed annual income	2. Psychology Today, 68% derived more satisfaction from leisure	3. 15% of American households own a minicomputer	4. number of jobs has declined	5. capital investment has dropped by 40%	6. corporation 20% tax allowance	7. technological advancement displacing 1% of the U.S. work force	8. opened New York State's Employment Service	9. Dictionary of Occupational Titles 30% of all job titles are new	10. Will not grant a patent to contributors to environmental pollution	11. over 60 year old segment is almost 1/4 total population	12. The President has just signed the bill passed by Congress to establish HMIS	13. federal legislation has established limits medicare charge	14. major decline in institutionalized health	15. number of para-medics and other "physician substitutes" equals medical doctors	16. cost of medical education has become extremely expensive	17. 50 states now have statutes determining entry level certification	18. preventive medicine has made a great step forward	Page Two Total	Grand Total
10. The Federal government of the U.S. will not grant a patent on any invention or device which is deemed to contribute to environmental pollution through either its production or use according to criteria established by the Environmental Standards Commission.																				
11. The United States Census Bureau announces that the over 60 year old segment is almost 1/4 of the total U.S. population with almost 90% of them receiving Social Security benefits.																				
12. The President has just signed the bill recently passed by Congress into law that establishes the National Health Insurance System to cover all U.S. citizens to establish HMIS.																				
13. Newly enacted federal legislation has established limits on health care services and a maximum charge allowable for these services.																				
14. A recent study of the delivery of health care services has reported a major decline in institutionalized health care and a shift toward preventative medicine.																				
15. The Syracuse area Department of Labor report on occupations and employment indicates that the number of para-medics and other "physician substitutes" equals the number of medical doctors employed in delivering primary health care.																				
16. A recent New York Times article reported that the cost of medical education has become extremely expensive due to the technical level required of graduates and the continued expansion of the technical equipment needed in the preparation programs.																				
17. With Alabama enacting licensing requirements yesterday, all 50 states now have statutes determing entry level certification of all health service workers including nurses, technicians and para-medical personnel. In all occupational areas at least a two year college degree is required.																				
18. With the establishment of local "environmental health monitoring" units, preventive medicine has made a great step forward, the county Health Commissioner commented yesterday. These new units will employ a large number of technically trained people in the health field.																				
Page Two Total																				
Grand Total																				

APPENDIX B

SCENARIO REACTION FORM

SCENARIO REACTION FORM

DIRECTIONS:

The scenario describes a number of events that have a bearing on public education agencies that provide occupational education services. Please indicate the significant impacts the events described in the scenario would have, if they occurred as described, on your agency's occupational education program. Seven (7) categories have been listed as possible aspects of educational programs that could be affected by the events in the scenario. Record your assessments related to each category.

CURRICULA:

INSTRUCTIONAL STRATEGIES (mode, media, etc.):

ADMINISTRATION/GOVERNANCE:

STUDENTS:

FACULTY:

INTERNAL/EXTERNAL RESOURCE ALLOCATIONS:

FACILITIES: