December 1983

The Effects of an Experiential Based Instructional Program for Exploring Vocations in Emerging and New Technologies as Reflected by Student Growth in Career Maturity

Hilton A. Seay

East Tennessee State University

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THE EFFECTS OF AN EXPERIENTIAL BASED INSTRUCTIONAL PROGRAM FOR EXPLORING VOCATIONS IN EMERGING AND NEW TECHNOLOGIES AS REFLECTED BY STUDENT GROWTH IN CAREER MATURITY

East Tennessee State University

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FOR EXPLORING VOCATIONS IN EMERGING AND NEW TECHNOLOGIES
AS REFLECTED BY STUDENT GROWTH IN CAREER MATURITY

A Dissertation
Presented to
the Faculty of the Department of Supervision and Administration
East Tennessee State University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
Hilton A. Seay
December, 1983
APPROVAL

This is to certify that the Graduate Committee of

HILTON A. SEAY

met on the

21st day of November, 1983.

The committee read and examined his dissertation, supervised his defense of it in an oral examination, and decided to recommend that his study be submitted to the Graduate Council and the Dean of the School of Graduate Studies in partial fulfillment of the requirements for the degree Doctor of Education.

Signed on behalf of
the Graduate Council

Dean, School of Graduate Studies
Abstract

THE EFFECTS OF AN EXPERIENTIAL BASED INSTRUCTIONAL PROGRAM
FOR EXPLORING VOCATIONS IN EMERGING AND NEW TECHNOLOGIES
AS REFLECTED BY STUDENT GROWTH IN CAREER MATURITY

by

Hilton A. Seay

The purpose of this study was to determine if participation in an experiential based instructional program for exploring vocations in emerging and new technologies would enable academically able high school juniors and seniors to attain increased maturity of attitudes and competency in career decision-making skills as measured by the Career Maturity Inventory.

A total of 64 students participated in the study. Participants came from a pool of 132 junior and senior high school students identified as having a grade point average that placed them in the top thirty percent of their class. A pretest and posttest utilizing the Career Maturity Inventory was administered to both an experimental and control group consisting of 32 subjects each.

Statistical tests of significance for all null hypotheses involved the use of analysis of covariance. The effects of participation in the program, "Academically Able-Exploring Vocations in Emerging and New Technologies (AA-EVENT)" were determined by comparing the posttest scores of the experimental group and control group on the Attitude Test and each of five subtests of the Competence Test of the Career Maturity Inventory (CMI). In each case, the appropriate pretest scores were used as a covariate of the posttest to control for any initial inequalities. All null hypotheses were tested using a .05 level of significance.

There was a significant difference (p < .01) in the maturity of attitudes critical in making realistic career decisions between the experimental and control groups. Participants in AA-EVENT scored significantly higher than non-participants.

There was a significant difference (p < .01) in self-
appraisal in regard to career capabilities between the experimental and control groups. Participants in AA-EVENT scored significantly higher than non-participants.

Participants in AA-EVENT scored higher than non-participants on the "Occupational Information," "Goal Selection," and "Problem Solving" subtests of the CMI. Even though gain was significant at the .10 level for each subtest, it was not significant for the purpose of this study.

The least difference between the experimental and control groups was obtained on the "Planning" subtest of the CMI. Even though the experimental group had the higher mean, the difference yielded ($p < .05$) was not great enough to consider participation in AA-EVENT as having an effect.

It was concluded from this study that participation by academically able high school juniors and seniors in an experiential based program designed to explore vocations in emerging and new technologies resulted in increased maturity of attitudes and competency in career decision-making skills. Specific areas of improvement were (1) attitude toward the world of work, (2) knowledge of self, (3) knowledge of the world of work, (4) goal selection skills, and (5) solving problems in career developmental tasks. Participation in AA-EVENT was found to have little positive effect on improving skills in the career planning dimension of career maturity.
Institutional Review Board

This is to certify that the following study has been filed and approved by the Institutional Review Board of East Tennessee State University.

Title of Grant or Project THE EFFECTS OF AN EXPERIENTIAL BASED INSTRUCTIONAL PROGRAM FOR EXPLORING VOCATIONS IN EMERGING AND NEW TECHNOLOGIES AS REFLECTED BY STUDENT GROWTH IN CAREER MATURITY

Principal Investigator Hilton A. Seay

Department Supervision and Administration

Date Submitted August 24, 1982

Institutional Review Board Approval, Chairman. [Signature]
ACKNOWLEDGMENTS

As a goal is reached, one reflects upon the many circumstances and individuals that have made it possible. This project would not have been possible without the aid and support of those individuals mentioned in the following section.

A special expression of love is extended to my wife, Betty, my sons, Ronald and Bertrum, and my daughter, Kathy, for their support and sacrifices during the time of my doctoral studies.

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Special acknowledgment is made to my Doctoral Committee: Dr. Floyd Edwards, Chairman; Dr. Charles Burkett; Dr. William Evernden; Dr. Robert Shepard; and Dr. G.K. Ginnings.

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Chapter 1

INTRODUCTION

Events causing numerous technological and social changes in our society prompted Alvin Toffler (1970) to write his classic Future Shock. Future Shock has influenced the lives of millions of people in America and has permeated the educational scene. The future is always at the doorstep.

Society has been moving from old to the new. Society has in fact changed to an economy based on the creation and distribution of information. People in the United States must acknowledge that they are a part of a global economy and can no longer operate within an isolated, self-sufficient, national economic system (Naisbitt, 1982).

The social unrest of the 1960's led to an emergence of greater concern for society's problems and a major criticism that American education had been neglected in adequately preparing young people to make effective decisions regarding future educational and career plans. This concern also was accompanied by a growing consensus that the federal government should play a part in solving the problems of the unemployed, the rising cost of living, and the desperate need for skilled workers (Calhoun and Finch, 1976).
Education, as Ginzberg (1971) stated, did not acknowledge the preparation for work as one of its goals even though work, education, and training for work represented a critical area of human activity. Two forces emerged to resolve the disparity between education and the demands of the world of work: (a) career education and (b) the redirecting of vocational education as identified by educational leaders, Project Baseline (Lee, 1976), and the seventh Annual Gallup Poll (Elam, 1979).

Historically, only a small segment of the total secondary school population enrolled in some form of cooperative vocational education. Through cooperative vocational education, experiences in the world of work that help to create attitudes, values, and work habits essential to survival in the world of work are acquired. Too many were being prepared for college, while too few students were being prepared as technicians, and not all students were being prepared for the world of work.

In recent years vocational leaders promoted activities which enhanced the transition of youth from school to work. Career education sought to prepare students to be motivated to work, to add dignity to all work, and to provide students with greater opportunities for career exploration. This involved more activities which interfaced with the world of work, also referred to as experienced-based education (Williams, 1980).
Experience in the work-place setting provides developing youth an opportunity for the acquisition and refinement of practical skills which cannot be provided within the school setting. Preparation for work has been recognized as one of education's most vital goals; yet, with advanced technology, our society has responded in opposition to its promulgation (Bowles and Gintis, 1976).

According to Toffler (1975), educators must provide learning experiences to help students cope with real life situations and assist them to anticipate and adapt to change because of constant evolvement of new and emerging technologies in today's society. Toffler (1975) also suggested that learning experiences must prepare them to make realistic decisions regarding their career plans and facilitate their developmental growth in personal and career maturity.

**Statement of the Problem**

The problem of this study was to determine if participation in an experiential based instructional program for exploring vocations in emerging and new technologies would enable academically able high school juniors and seniors to attain increased maturity of attitudes and competency in career decision-making skills as measured by the **Career Maturity Inventory**.
Significance of the Study

The study was significant for the following reasons:

1. The result of this study will contribute to the validation of the State of Tennessee funded project, "Academically Able-Exploring Vocations in Emerging and New Technologies (AA-EVENT)."

2. The result of this study may give the Tennessee State Department of Education a basis for deciding if additional funds should be made available to expand the existing program to other school systems.

3. Information obtained from this study will be available for use by other school systems designing learning experiences to facilitate student developmental growth in career decision making.

4. The result of this study should provide information for other schools in considering the appropriateness of adding such a course to their curricula.

5. The result of this study may reveal information that can be used to better inform the public in an effort to improve the image of vocational education.

6. The result of this study should provide information valuable to counselors and parents in helping high school students make realistic choices and plans for future vocations and careers.

7. Information obtained from this study will be valuable for planning improvements in the program for
academically able students in the school where this study originated.

Assumptions

The following assumptions were made in this study:

1. Responses on the Career Maturity Inventory were based upon the true feelings of the participants.

2. All participants in AA-EVENT were motivated to make maximum personal use of opportunities and experiences available to them.

3. Compensation was made for pre-existing differences in participants by the statistical process utilized to analyze data.

Hypotheses

The following research hypotheses were tested for this study:

1. There will be a significant difference between the scores of the experimental group and the scores of the control group on the "Attitude" component of career maturity as measured by the Career Maturity Inventory.

2. There will be a significant difference between the scores of the experimental group and the scores of the control group on the "Self-Appraisal" component of career maturity as measured by the Career Maturity Inventory.

3. There will be a significant difference between
the scores of the experimental group and the scores of the control group on the "Occupational Information" component of career maturity as measured by the Career Maturity Inventory.

4. There will be a significant difference between the scores of the experimental group and the scores of the control group on the "Goal Selection" component of career maturity as measured by the Career Maturity Inventory.

5. There will be a significant difference between the scores of the experimental group and the scores of the control group on the "Planning" component of career maturity as measured by the Career Maturity Inventory.

6. There will be a significant difference between the scores of the experimental group and the scores of the control group on the "Problem Solving" component of career maturity as measured by the Career Maturity Inventory.

Limitations

The following limitations were imposed on this study:

1. The study was limited to students in the eleventh and twelfth grades at Greeneville High School who had a grade point average in the top thirty percent of their respective classes.

2. The study was limited to the 1982-83 school year.

3. The study was limited to results obtained from the Career Maturity Inventory.
4. The study was limited to the review of selected literature for the period 1909-1983.

5. The study was limited by having all self-selected participants as the experimental group.

Definitions of Terms

For the purpose of this study, terms were operationally defined as follows:

**AA-EVENT**

AA-EVENT is the acronym for the program entitled Academically Able-Exploring Vocations in Emerging and New Technologies.

**Academically Able Students**

Academically Able Students are those students in the junior and senior classes who have maintained an overall grade point average which would place them in the top thirty percent of their respective classes.

**Attitude Scale**

Attitude Scale is the student's score on the Career Maturity Inventory which elicits the feelings, the subjective reactions, and the dispositions that an individual has towards making a career choice and entering the world of work.

**Career Maturity Inventory (CMI)**

Career Maturity Inventory is a measure of the maturity of attitudes and competencies critical in realistic career
decision making conceived and constructed by Crites (1978). This inventory provides two types of measures, the Attitude Scale and the Competence Test.

**Competence Test**

*Competence Test* is a measure of cognitive variables involved in choosing an occupation. The five parts of the *Competence Test* are scored independently of one another and include: self-appraisal, occupational information, goal selection, planning, and problem solving.

**Goal Selection**

Goal Selection is a subtest of the CMI *Competence Test* and is assessed by having the student choose an occupation for a sampling of individuals whose personal and demographic attributes are described.

**Occupational Information**

Occupational Information is a subtest of the CMI *Competence Test* and is a measure of the student's knowledge of the world of work in relationship to the duties and tasks that workers perform.

**Planning**

Planning is a subtest of the CMI *Competence Test* and measures a student's awareness of the necessary chronological steps that must be taken in order to achieve a career goal.
Problem-Solving

Problem Solving is a subtest of the CMI Competence Test and is a measure of how well an individual can solve the problems occurring in the career developmental tasks he is expected to accomplish in preparation for entry into the world of work.

Self-Appraisal

Self-Appraisal is a subtest of the CMI Competence Test and is based on the assumption that individuals who can accurately appraise the career-relevant capabilities of others are good self-appraisers.

Procedures

Subjects for this study were students from the 1982-83 junior and senior classes of Greeneville High School who had a cumulative grade point average that placed them in the top thirty percent of their class. The nonequivalent control group and treatment group pretest/posttest design was used for this study (Campbell and Stanley, 1963). The treatment consisted of a vocational course designed to expose academically able students to emerging and new technologies in the fields of energy, ecology, and microcomputers.

Crites' (1978) Career Maturity Inventory was used to measure the dependent variable. Data collected was analyzed by using the analysis of covariance.
Procedures for this study will be presented in more detail in Chapter 3.

Organization of the Study

This study is organized into five chapters. Chapter 1 contains the introduction, statement of the problem, significance of the study, assumptions, research hypotheses, limitations, definition of terms, procedures of the study, and the organization of the study.

Chapter 2 contains the review of the literature and research related to the problem statement.

Chapter 3 contains the instrumentation and methodology used in the study.

Chapter 4 contains the data collected, analysis of the data, and the findings.

Chapter 5 includes the findings, conclusions, recommendations, and summary of the study.
Chapter 2

REVIEW OF RELATED LITERATURE

Introduction

Basic institutions such as the family, church, and school have been undergoing tremendous stress. Alvin Toffler in his *Future Shock* (1970) stated that society was being swept along by a rapidly escalating series of "future shocks." Our future had suddenly merged with our present.

The nature of education prepares each person to develop his unique strengths as fully as possible within the context of the world in which he lives. Unfortunately, many school systems are still preparing students for a 19th century industrial world. Many curricula still look to the past rather than the future. Educators tend to assume that the future will merely be an extension of the past.

Every organization becomes embedded in an environment of forces. These forces condition its form, its decision process, and its utilization of resources.

Advanced technology is suddenly everywhere - in offices, factories, universities, colleges, schools, even in private homes; the revolution has only begun. Nothing in the past can match the current flurry of activity.
With nearly universal attendance a reality, high schools are obligated to prepare young people for gainful employment, especially the great number of students who do not go to college.

General literacy skills are more likely than any other factor to yield success in the labor market. Such skills facilitate further education. They qualify young people for training in the technical fields that pay well but do not require a college degree.

Because of today's crisis in the workplace, changes are called for in education as dramatic as those that Sputnik brought. The area of vocational education is very complex and has changed greatly in the past two decades.

Participation in vocational education is associated with higher levels of employment. Most vocational students obtain jobs in the area in which they were prepared.

The years in school help children to make sense out of and to take a responsible part in the bewildering business of living. Just as schools exist for people, the key to their success is the people who work in them. One of the major problems in our society is the rapid changeover to a culture based on the electronic image.

**Emerging Technologies**

Technology is presenting a major challenge to United States education. Increasingly, schools and colleges are
being called on to play a role in narrowing our technology
gap. Schools and colleges may be in the position of being
forced to take on a technological mission without adequate
funding. In 1981, 21 governors formed a special task
force on technological innovation under the banner of the
National Governors Association.

Stanley Pogrow (1982) stated that in the next few
years schools may be forced to provide extensive technolo-
gical training, regardless of the capabilities or the
desires of the educators. He contended that the failure
to provide technological education could result in the
"environmental collapse of this nation's schools."

According to Ricker (1976), there was a need for the
introduction of the future into our schools on an equal
time basis with the past and the present. He also stated
that technological and social change was outracing our
educational system, and the social reality was trans-
forming itself more rapidly than our educational images
of that reality.

A focus on the future, like education itself, is
relevant to all learners, regardless of age. A new
generation of high-school studies will descend upon us
shortly. Today's boom in high technology means that the
schools will have to assume a different role and present
a different content to keep up with the students and the
society.
In an article concerning careers for the 1980's, Burns (1982) described the situation of workers' skills, attitudes, job locations, and the job market as changing. Young persons entering the work force should be aware of and prepared for this change. About the only thing we can predict for sure about the future is that it will be different from today.

The regular introduction of new technology and changes into the needs and tastes of people continually changes the overall economy and employment in almost all occupations. The development of new technology has both created and eliminated thousands of jobs.

Burns (1982) stated that the television industry was "created" within the past 30 years; the computer has "created" a whole series of new occupations such as programmers, systems analysts, equipment operators, and equipment maintenance and repair people.

These new systems require many kinds of new skills and workers with new skills to operate, maintain, and install these systems. High technology is big, complex, centralized, and expensive and tends to replace people with machines, according to Miller (1982). On the other hand, he stated that appropriate technology is small, simple, decentralized, and inexpensive and preserves meaningful work for people.
Ecology

Our culture went through a period of discontinuity during the 1960's when civilization entered the Age of Ecology. By the end of the decade, it was obvious that the most crucial space was not outer space, but inner space, where we build our conceptions of the world and of how humanity fits into it - the space of ecological insights (Miller, 1982).

There are signs that there will be a sustainable earth society over the next few decades. There are growing signs that we can make such a transition. In 1965 only a few specialists had ever heard of the words ecology, pollution, and environment. Today in affluent nations, there is sophisticated awareness of these problems, and this knowledge is spreading to poor nations.

Even more important, this awareness has been translated into action. The amazing thing is not a lack of progress but that so much progress has been made since 1965 (Miller, 1982).

We must avoid some traps in order for people to become involved in sustaining our earth society. First, according to Miller (1982), we must avoid the "gloom and doom" trap which merely paralyzes us with fear. Second, we must avoid the technological optimism trap. Third, we must avoid the "good old days" trap. The fourth trap we must avoid is believing that we merely have to go back to nature.
By having a society of people working together, this exciting transition in history can happen so that we preserve rather than destroy the only home we and our descendents will have. The environmental crisis is concerned with the kind of creatures we are and what we must become in order to survive.

While many matter resources, such as copper, lead and silver, can be recycled, we can never recycle energy resources. Once a fossil fuel resource, such as coal, oil, or natural gas, is burned, it is gone forever as a useful energy source. Resource use is tied to economics. Something is useful as a resource only if it can be available at a reasonable cost.

Miller (1982) defined pollution as an undesirable change in the physical, chemical, or biological characteristics of the air, water, or land that can harmfully affect health, survival, or activities of humans or other living organisms.

Miller (1982) described pollutants as being of two types, degradable and nondegradable. A degradable pollutant can be decomposed, removed, or consumed and thus reduced to acceptable levels either by natural processes or by human-engineered systems as long as the systems are not overloaded.

Nondegradable pollutants are not broken down by natural processes. These nondegradable pollutants must
be either prevented from entering the air, water, and soil or be kept below harmful levels by removal from the environment.

Ecologists are concerned with five levels of organization of matter: organisms, populations, communities, ecosystems, and the ecosphere. The ecosphere is a remarkably effective and enduring system. It must endure, or life will become extinct. The goal of ecology is to find out just how everything in the ecosphere is related.

Energy

For the last 20 years, conventional wisdom has had it that the "new technology" was about to revolutionize the world. As we enter the 1980's, we may well be moving from the presumption to the fact. Energy education has reached new heights of visibility and effectiveness.

The economic and social well-being of this nation is now and will continue to be based on available and affordable energy. Miller (1982) defined energy as the ability or capacity to do work or produce change by pushing or pulling some form of matter, which is anything that has mass and occupies space. Energy is what all living things use to move matter around and to change it from one form to another.

In an article on energy update, Roberts (1981) stated that traditionally, our society has relied on the educational system to equip people with the knowledge,
skills, and attitudes needed to participate in society as informed, active citizens, workers, and consumers. As societal conditions, policies, and goals change, we expect commensurate changes in the educational process. If, as individuals and as a nation, we are to meet the multifaceted challenge which the energy crisis presents, it is imperative that energy be considered a basic educational theme throughout the school curriculum in all relevant disciplines and at all grade levels - from kindergarten through adulthood (Roberts, 1981).

At a consortium on energy opportunities, Lee Muntz said that "Education may, in fact, be the single most important resource available for the resolution of the critical energy issues facing the United States" (Snider, 1980). There is little doubt that our present decisions regarding energy use will affect the future of our civilization. It is vitally important, therefore, that we become better informed about our energy supplies and better motivated to solve our energy problems.

Harvey (1980) declared that the people of the United States are among the most creative and resourceful in all the world who are, also, among the most extravagant people of all times. Waste disposal systems are filled with enough food to feed millions of people. Highways are filled with speeding vehicles. Airports have rows of idling airplanes waiting turns to depart. In each
case, energy is needlessly consumed. The most favorable recourse is conservation.

The boom in solar energy is outrunning the supply of solar mechanics. The robot population - expected to reach 30,000 by 1990 - is growing faster than the number of qualified mechanics (Houston, 1981).

In a release by Houston (1981) in *U.S. News and World Report*, it was reported that tens of thousands of people are caught up in America's lucrative search for energy - not only oil, but also solar, synfuel, biomass, and nuclear. The frantic quest has been tempered only by the tight supply of qualified personnel. In this same release, it was also reported that the number of oil-field workers has multiplied six times in the last 10 years.

The energy push has put companies in a frenzy in their search for qualified people. The concern of energy industry planners is the future.

In the future, as new technology reshapes the region's economy and redefines the way many people earn a living, adequate supplies of electricity still will be needed to drive the computers and operate the robots, just as it has been needed to turn the machines and lift the loads in past economic growth.

**Microcomputers**

With the advent of each new technological innovation (radio, film, television), teachers have been challenged
to compete with the innovation for students' learning time and energy. The technological innovation has been turned into a beneficial educational tool. Haag (1983) acknowledges that the microcomputer with its software offers us another means to maintain vitality and enthusiasm in learning.

Mastery of this new technology is intellectually stimulating. The potential for creativity in the classroom and within the student is unlimited. This new technology exposes us to new ideas and patterns; it allows us to struggle with difficult new concepts and to apply learned concepts to both work and daily lives.

As awareness of the emergence of the microcomputers into our everyday lives develops, various states are including plans for funding computer instruction. Governor Lamar Alexander of Tennessee has incorporated computer instruction as one of the ten points in his Better Schools Program for Tennessee.

The students enrolled in AA-EVENT are not only capable of understanding the logic and concepts necessary for the operation of the microcomputer, but they also have the potential for developing programs for this new technology as well as the ability to expand those technologies already in existence.
Academically Able Students

Because of the emerging, advanced technologies in society today, prospective job seekers during the 1980's should be aware that entry requirements for many jobs will rise, according to a report in Today's Education (Pilot, 1982). For one thing, jobs will become more complex. Pilot (1982) states that persons contemplating enrolling in college should know that there has been and, in all likelihood, will continue to be an overall surplus of college graduates. Therefore, the need for academically able students to have training other than college is a necessity.

Amara and Leona (1983), in an article concerning a vocational school for academically talented students, present the idea that secondary guidance counselors are often hesitant to advise academically talented students to enter vocational/technical secondary schools. The counselors fear that vocational programs will not prepare talented students for college. Parents, according to Amara and Leona (1983), tend to share these reservations.

Many secondary vocational/technical programs are not equipped to handle academically talented students, because they restrict their programs to traditional vocational training. Yet job opportunities in these traditional areas are dwindling. Meanwhile, opportunities
are expanding in such areas as computer science, energy, ecology, engineering, and medicine.

In 1979 a secondary vocational/technical school in Massachusetts began focusing on attracting academically talented students - a population that did not traditionally apply to the school. A four-year program incorporating academic courses for college preparation and technical courses were initiated.

Amara and Leona (1983) reported that during their senior year of study, students were given the option of studying with a person in a particular technical field by being involved in a cooperative placement in a local firm. Working with practicing engineers or scientists helps the students better understand the application of the technical skills they have acquired.

This four-year school demonstrates that vocational schools can attract and serve the needs of academically talented students. Many jobs today demand highly trained graduates of technical colleges, yet many high school graduates enter these colleges with little preparation for rigorous curricula.

The AA-EVENT Program at Greeneville High School was designed for academically able students in order for these students to acquire a better awareness of jobs now available and to have some familiarity with the skills necessary for these jobs. Through the development and
extension of this program, other school systems will have access to the same program for their academically able students.

Reis and Renzulli (1982) conducted a study on new approaches for serving gifted students. They concluded that programs for serving gifted students should be encouraged, but research must validate the programs. Without such validation, the support that educational programs for the gifted have gained during the past decade could easily fade away.

The AA-EVENT Program at Greeneville High School is in progress for the third school year. This study is a major contribution to the validation for the effectiveness of the program. The results obtained could mean a much broader available avenue of study for academically able students throughout the state of Tennessee.

**Experiential Learning**

Persons about to enter the job market should accept the fact that change will continue to occur. By being aware of what is happening in various businesses, industries, and occupations, it is possible to project future worker requirements and to be more realistic when preparing for a career.

The entire American labor force is reaching a higher educational level. In an article reviewing the book, The
Betrayal of Youth: Secondary Education Must Be Changed, Haase and Young (1981) stated that the author's major themes are that the curriculum has been dehumanized and that school perpetuates a deviance from - not an encounter with - life. The author of the book sees the academic tradition of the secondary school as limited and limiting, a world of acquiring, memorizing, and manipulating facts to solve problems. There is a need for education to contain flexibility, personal competence, and lifelong learning as survival skills, not frills.

Like other social institutions, educators will have the chance to put technology to work in its service. Roller (1978) maintained that what is needed is the re-establishment of a learning community beyond formal school, which as now constituted, is far too isolating, so much so that young people do not know the roles available in the society and the variety of styles in which they are played. There needs to be a means of connecting the diversity of the society in order to prevent schools from becoming so isolated and the society from being so suspicious.

Work Experience

A major criticism of American education has been its neglect in adequately preparing students for eventual work. Career and vocational education have responded to this omission by stressing preparation for work as one of their
major goals. However, vocational education has been slow in responding to the significance of work experience as a vital part of its mission. Career education has not been widely accepted at the secondary level. Even where it has been accepted, the concern for work preparation through actual work experience has been minimal. Owens and Owens (1979) indicated that where career education has been adopted at the secondary level, only about 10% of the students participating are involved in experience-based programs.

Work experience is fundamental to experience-based education. Literature indicates that the experiences gained through work are extremely beneficial to the process of development. A serious problem has evolved because so few opportunities exist for youth to gain work experience. Both career and vocational education have recognized this problem and have as a major goal the preparation of adolescents for work and eventual employment. It is believed that career and vocational education experiences enhance and promote vocational maturity when there is an association with the world of work.

Proponents of career and vocational education programs believe that the experience-based aspect of their programs prepare youth to make a smoother transition into the world of work than those students who do not participate in
such programs. Work experience is considered to be the matrix for this phenomenon. Yet, supportive research regarding the benefits of experience-based career education and vocational education is lacking (Hedin and Conrad, 1979). Owens and Owens (1979) indicated that experience-based programs have been difficult to evaluate since so little is known about the characteristics which make them successful learning experiences.

A study was conducted involving 2,000 high school graduates at three, six, and nine year intervals to determine the quality and availability of course offerings on later academic and occupational proficiency. Respondents indicated that more courses related to entering the world of work should be provided to promote greater occupational diversity (Salas and Palleria, 1977).

Marks and Wohlford (1971) in a study of 225 college students, half of whom were involved in a cooperative program, indicated that the cooperative education group excelled in academic performance. They believed the results were intriguing since both experimental and control groups were matched in academic potential. They attributed the results to the fact that the cooperative program students had stronger educational and vocational goals.

The fact that students with work experience illustrate greater vocational maturity than those without
work experience is supported by Reubens (1977). He indicated that in comparisons of young people who enter work with similar youth who remain at school, the young workers are more socially mature, satisfied, and successful and make an easier transition to work.

**Occupational Information**

According to Moor (1976) the need for occupational information by secondary students is well justified. When secondary students were asked about the type of information they would find most helpful, they requested individual advice on employment opportunities, general job information, and talks by individuals with first-hand knowledge of particular occupations.

Students need to be aware of the status of job opportunities. Pilot (1982) reported that two out of every three new workers in this decade will probably be women. Also, he reported that the Black labor force is expected to grow faster than the average, because the Black population has been growing faster than the White population.

Pilot (1982) also reported that among the top ten occupations, the only one requiring post-secondary education is professional nursing. On the entire list, only seven occupations - roughly one-fifth - require a four-year college degree.

*U.S. News and World Report* (Houston, 1981) contended
that colleges are not turning out enough engineers with
the training that businesses need. This is just one of
the problems created by the explosion of new technology,
which experts predict will account for most of the
15,000,000 new jobs expected to be created in the United
States by 1990.

Industry's challenge will be to transform this tech-
nology into new products and services. To do that,
people will be needed to perform tasks that were scarcely
imagined only a few years ago.

Pilot (1982) related that manufacturing among goods-
producing industries, which has been relatively stagnant,
is expected to increase during the 1980's. This is pri-
marily because of the anticipated strong demand for
durable goods such as computers and other high-technology
items.

Pilot (1982) also predicted that jobs for secondary
teachers and college professors are expected to decline.
Additional adult education teachers will be needed.

Information of this type related to future occupa-
tions is needed by students of today who will be the
workers of tomorrow. The AA-EVENT program has included
in its curriculum such up-to-date information to the
students through required readings as well as by guest
speakers who would be knowledgeable of such facts.
Adult Association

Hoyt (1975) reiterates the importance of adult association for the purpose of enhancing vocational maturity through occupational information. While association with adults occurs through the world of work and while that association may be a source of occupational information, it is not an index of vocational maturity as recognized by Super (1974).

A study conducted by DeFleur (1963), in which he attempted to learn how students acquired occupational information, disclosed that the most effective source of occupational information was through contact. Coleman (1974) stated that one way to provide youth with opportunities for acquiring occupational knowledge and work experience was to facilitate their contact with adults. This adult association should be arranged before the students' termination of school, further enhancing their transition from school to work.

Career Development

People must decide reasonably what they need in light of what is available. The division between education and the real world must be made. Education must cease to be seen as a period of preparation for life completed by a specific time. Johnson (1981) stated that less weight needs to be placed on the process of credentializing and
far more attention needs to be given to enabling an individual to be aware of his limitations and potential. It must not be assumed that this transformation is required.

The transition from school to work is difficult at best; however, the number of pitfalls that individuals are likely to encounter depends on how well they are able to assess their interests and abilities and match them with work traits and characteristics in specific occupations. How well the individual plans and prepares for the jobs that tomorrow's economy will produce will help determine his success in career maturity (Pilot, 1982).

According to Jordaan and Heyde (1979), the two components of career maturity, work experience and occupational information, impart a great impact on an individual's success in the world of work.

Work Experience: The individual who becomes involved in work should have more career maturity. The student has an opportunity to try himself out in an adult role, to become more familiar with the world of work, and to explore interests and abilities with teachers, employers, and co-workers.

Occupational Information: That individual who makes the most extensive use of reliable occupational information will be better pre-
pared to make appropriate educational preferences (p. 176).

The concept of career development, or vocational choice, as it was first called, originated with Parsons (1909) when the characteristics of individuals were matched with the human requirements of the occupation. Parsons (1909) wrote that a person's vocational choice is his greatest decision and that it occurs at a time in his life when he is about to enter the world of work. This was substantiated by the theories of Dvorak (1935) and Paterson and Darley (1936). Dvorak's (1935) work included identifying differential aptitude patterns for occupations, and Paterson and Darley (1936) conceptualized choice as a decision which the person makes at a given moment in time. According to these initial theories, a person gave little or no thought to a vocational choice until he reached the end of his educational goals and was confronted with the problem of entering an occupation.

Within the past 25 years, theorists of career development have stated that choice behaviors are a process and develop as the individual grows older (Dysinger, 1940; Beilin, 1955) and that an individual makes a series of related decisions that finally end in a chosen occupation (Ginzberg, Ginzberg, Axelrad, and Herma, 1951; Super, 1953; Tiedman, 1961; and Crites, 1961).

According to Tolbert (1974), career development refers
to the lifelong process of developing work values, crystallizing a vocational identity, learning about opportunities, and trying out plans in part time, recreational, and full time work situations. The terminology of "career development" is of recent origin; however, the term is important because it implies that a person is involved in a long-term process of arriving at a career decision and has made previous choices, each affected by various persons, conditions, and needs.

Pietrofesa and Splete (1975) mention that:

Choices or decisions may be made to satisfy needs or to implement a self-concept. It is reasonable to suggest that an individual needs to be involved in true decision making, needs to know a choice is to be made, and that the choice is based on knowledge of self and available alternatives.

(p. 159)

This theory relates to this study in that a student in the AA-EVENT program not only has the opportunity to learn about career choices but also has the chance to develop self-awareness and to participate in careers of his choosing.

Crites (1965) linked decision making and vocational maturity together. He stated that vocational maturity implied that as a person matured, he would be able to
make better decisions concerning his career and that this encompassed more than vocational choice. Crites (1965) included, as part of vocational maturity, attitudes toward decision making, comprehension, and understanding of job requirements, planning activities and abilities, and development of vocational capabilities.

These attitudes with which vocational maturity is concerned are likely to change during an adolescent's high school experience, and this change is undoubtedly due to a combination of time and also of experience (Super and Crites, 1962).

Herr and Enderlein (1976) did a study which indicated that the effects of curriculum can also enhance vocational maturity and that educational planners involved in career education should be encouraged since vocational maturity is a central criterion for career education.

**Career Maturity Inventory**

Vocational maturity and/or career maturity has been considered of great importance to many investigators concerned with vocational development (Super and Overstreet, 1960; Crites, 1965, 1969). In a theory of occupational choice as proposed in Super's (1957) first monograph of the Career Pattern Study, the process of choosing an occupation was described as developmental and is modified with time.
An early model of vocational maturity was included in Super and his associates' work (1955; 1957) in the Career Pattern Study which analyzed the career development of ninth grade boys. It was in this study that the concept of career or "vocational" maturity, as it was first called, was introduced to designate "the place reached (by an individual) on the continuum of vocational development from exploration to decline" (Super, 1955, p. 153). Crites (1965) was one of the original staff members of the Career Pattern Study. He developed the Career Maturity Inventory against the background or theory which emanated from the Career Pattern Study.

The Career Maturity Inventory (CMI) was selected as the measure of career maturity for this study. The instrument includes an Attitude Scale and a Competence Test designed by Crites (1965). The CMI was intended to define operationally the various elements of career maturity, and in this way, follow Super's (1955) construct of career maturity which consists of five dimensions: (1) Orientations to Vocational Choice; (2) Information and Planning; (3) Consistency of Vocational Choice; (4) Crystallization of Traits; and (5) Wisdom of Vocational Preferences. Crites (1965) elaborated upon Super's Orientation, Information, and Crystallization dimensions and suggested that they be analyzed further into what Crites later called Career Choice Attitudes.
Crites originally called his instrument the Vocational Development Inventory (VDI). In 1973 he changed the VDI to CMI - Career Maturity Inventory - and he explained the rationale for this on the first page of the Theory and Research Handbook (1973):

First, it reflects the current emphasis on career education that is a parallel process to career development. The interface between the two is a common focus upon youth's emerging readiness and competence to enter and compete in a world of work. Second, 'career' does not have some of the specialized meanings that are associated with 'vocational'; it symbolizes a new point of departure and value system in preparing everyone to play a meaningful and productive role in the marketplace. And third, 'maturity' captures and conveys the concept or progressive change which underlies emerging career awareness exploration and decision making - the variables which the Career Maturity Inventory has been constructed to measure. (Crites, 1973, p. 1)

Research has consistently shown that vocational maturity is positively related to intelligence (Crites,
1971). The intent of this study is to determine the effectiveness of a planned approach for academically able students to explore vocations in new and emerging technologies.

Summary

A problem for the leadership of today is to have the skill and resources to bring about timely renewal to meet the challenge of the future. In trying to find words for the changes that now take place within a single lifetime, we speak of the great "speed" of history. Every now and then human affairs undergo a shocking transformation, at which time the tone of the world shifts radically almost overnight.

The key assumption is that we are in the middle of a transformation from the industrial era to a communication era. Failure to achieve the necessary transformation will lead to a disastrous collapse that could destroy our planet.

Americans must recognize the transformational nature of today and tomorrow. We are going to be forced to deal with high levels of change, uncertainty, and stress. Children must learn as they grow that they will always be structuring the world for themselves and that there are not reliable slick sets of answers.

School officials and curriculum designers are constantly involved in future-thinking, because they must
determine what children should study and because they must adapt to changing social and economic trends, such as enrollment declines and shifts in the composition of the student population. Such planning might be called everyday-future-thinking, and it is a basic administrative tool of school officials.

There is a need for better secondary programs, but these programs will be successful only to the extent that students feel the school has something to offer - to both now and the future. The results of decisions made today about curriculum policies and classroom practices will be with us throughout the future.

Both work experience and occupational information were seen as a key to this study. The intent of vocational education is to introduce and expose students to available choices for a career. The extension of this goal to the academically able students only extends this career awareness to more students. Through an experiential based instructional program, the students will be actively engaged in various fields, if they so choose. As early as 1957, Super stated that:

The individual who becomes involved in work experience will have an opportunity to try out an adult role, will become more familiar with the world of work, and will be able to explore his interests and abilities. That
individual will gain more specific occupational information and will have an opportunity to interact with adults in the world of work. (p. 28)

We need to teach people to cope with the realities of a finite universe. Futuristics can give people a useful set of perceptions that can help them cope with our rapidly changing world.

The future is not fixed but consists of a variety of alternatives among which we can choose those we want to realize. People are responsible for their future; the future does not just happen to them.
Chapter 3

INSTRUMENTATION AND METHODOLOGY

Introduction

Nowhere is the impact of our rapidly changing times felt more than in our schools. The advent of the microchip, with its potential to revolutionize data and management systems, and successful experiences with robotics, lasers, and other technologies, tell us that today's students will find careers in a world vastly different from the one in which they were born. They will live in a world dramatically different from the one in which they grew up. Because little is actually known today about future needs in terms of jobs for youngsters, educators must continuously update programs which teach occupational information and job skills.

Academically Able-Exploring Vocations in Emerging and New Technologies (AA-EVENT) was an innovative educational program designed to prepare students to meet the needs of a highly technological society. It gives students many opportunities to survey their career options.

The purpose of this study was to determine if participation in an experiential based instructional program for exploring vocations in emerging and new technologies would help academically able high school juniors and seniors
attain increased maturity of attitudes and competency in career decision-making skills as measured by the Career Maturity Inventory.

Description of the AA-EVENT Program

Academically Able-Exploring Vocations in Emerging and New Technologies (AA-EVENT) was a course offered at Greeneville High School that was designed to expose qualified students to expanding career opportunities in the field of energy, ecology, and microcomputers. It was initiated for the 1981-82 school year and continued during the 1982-83 school year.

Funding for the special program was through the Tennessee State Department of Education, Division of Vocational Education to the University of Tennessee and Greeneville City Schools. Melvin Miller and Joyce Bales were co-authors of the project.

Juniors and seniors who ranked in the top thirty percent of their respective classes according to academic achievement were eligible to participate in the full school year AA-EVENT program. Students could receive one credit for successful completion of classroom activities in energy, ecology, and microcomputers and on-site job experiences. Students were required to complete ninety hours of on-site community-based experiences and ninety hours of classroom activities.
The program was designed to create a strong linkage between the course and community resources. Throughout the course, students were involved in a variety of field trip experiences where new careers were emerging in the area of energy, ecology, and microcomputers. In addition to the field experiences, representatives of business and industry were invited into the classroom to offer challenges to the participating students.

The course outline (see Appendix A) and the modules (see Appendix B) for the AA-EVENT course were developed by six members of the staff of Greeneville High School. The members represented the areas of science, mathematics and computers, industrial arts, business, English, and guidance. The modules were developed to enable academically able students to explore emerging vocations in the fields of energy, ecology, and microcomputers.

Four types of activities were incorporated in the modules. One type of module was classified as reading. The twenty-six reading modules required the student to read selected materials, listen to available tapes, and answer questions designed to reflect the student's understanding of what he had read or heard.

The second type of activity consisted of twenty-two modules identified as investigative, requiring the student to inquire by mail, telephone, or in person about businesses and industries, processes, materials, etc. The
findings of these investigative activities were reported in a written paper or oral report.

The third type of module was labeled as experimental or constructional. Students were involved in conducting experiments or constructing predesigned projects.

The fourth type of module was listed as creative. The student completed an open-ended assignment, putting to use his own creativity. Nine creative modules were included in the program.

Of the total number of modules, the students were required to complete twenty specific modules. The student then chose twelve more modules, selecting from all three areas and all four types, making a total of thirty-two modules required for the course (see Appendix A).

The Population

The total population in this study consisted of 132 students. Of the 34 students enrolled in the AA-EVENT course, only 32 completed the course and served as the experimental group. An equal number matched by sex and grade level served as the control group. A total of 72 juniors and 60 seniors was identified during the summer of 1982 as having a grade point average that placed them in the top thirty percent of their class, thus making them eligible to participate in the AA-EVENT class. A letter was sent to each eligible student and his parent explaining the AA-EVENT class and an invitation to make application for participation. Enrolled in the course
for the 1982-83 school year were 15 juniors and 19 seniors. The 32 students who completed the course served as the experimental group for this research. From the group of eligible students that did not enroll in the course, a stratified random sample was taken to obtain an equal number of participants matched by sex and grade level to serve as the control group.

Instrumentation

The Career Maturity Inventory (CMI), formerly entitled the Vocational Development Inventory, was used as the measure of the dependent variable in the study. Data relating to the CMI were first collected in the fall of 1961. The CMI was developed to measure the maturity level of attitudes and competencies that were critical in realistic career decision making.

The CMI consisted of an Attitude Scale and five Competence Tests that included: (1) Knowing Yourself (Self-Appraisal), (2) Knowing About Jobs (Occupational Information), (3) Choosing a Job (Goal Selection), (4) Looking Ahead (Planning), and (5) What Should They Do? (Problem Solving). Each subtest consisted of 20 questions with an answer format of five multiple-choice responses, the last choice being "don't know." The "don't know" selection was presented as an alternative because
"analysis of the open-ended responses indicated a monotonous (decreasing) trend in 'don't know' responses from the lower to the upper grades" (Crites, 1978). The Competence Test was designed to assess the subject's knowledge about occupations and the decisions involved in choosing a career. The Competence Test measured the cognitive variables involved in choosing an occupation.

The Attitude Scale of the CMI purported to assess the level of maturity of the subject's attitudes and feelings toward making a career choice and entering the world of work by focusing on five additional clusters which were as follows: (1) Involvement in the career choice process, (2) Orientation toward work, (3) Independence in decision-making, (4) Preference for career choice factors, and (5) Conceptions of the career choice process (Crites, 1978).

These clusters were incorporated into the instrument by having the person answer such true-false items as, "I seldom think about the job I want to enter," "I plan to follow the line of work my parents suggest," and "Whether you are interested in a job is not as important as whether you can do the work." Using fifty such items, Crites (1978) was able to show that the Attitude Scale discriminates between developmental factors (age-grade) and career maturity.

Reliability

For determination of the reliability of the CMI
Attitude Scale, the Kuder-Richardson-Formula 20 was used to calculate an internal consistency estimate for item data from grades six through twelve in a standardization sample. The internal consistency was found to be .74 (Crites, 1978). This was regarded as consistent with theoretical expectations in that the instrument was designed to measure related but not identical clusters of vocational attitudes. Thus, the internal consistency could be expected to be high but not total.

The stability coefficient was found to be .71 (Crites, 1978) by using a standardization sample of 1,648 students retested after one year. This was also theoretically expected in that vocational behavior was assumed to mature over time. Thus test-retest reliability would need to be low enough to allow for maturation of subjects on the variable of career maturity but high enough to systematically measure the variable.

Validity

Content validity, criterion-related validity, and construct validity were used for the determination of validity of the Career Maturity Inventory. Sources of content validity were both rational and empirical. Items for the Attitude Scale were gathered from a pool of about 1,000 items whose content had been deduced from central concepts in career development theory. Fifty of these items were eventually retained using Flanagan's procedure
for initial standardization. These items were presumed to have a content that was theoretically relevant and representative (Crites, 1978).

An empirical measure was made in a study (Crites, 1978) in which ten expert judges rated the empirical scoring key and a "rationally" derived one according to which item responses seemed indicative of a more mature level of career attitudes. Results showed a 74 percent level of agreement between judges' choices and responses of the standardization sample.

Criterion-related validity was determined by researchers who compared the Attitude Scale to similar measures on particular variables. The Attitude Scale was compared to the Occupational Aspiration Scale, a measure of realism of career aspiration. Using ninth (N=79) and twelfth (N=58) grade students, Bathory obtained \( r \)'s of .39 \( (p < .01) \) and .31 \( (p < .05) \), respectively (Crites, 1978).

In a sample of 1,648 males and females in grades six through twelve, Hollander found significant covariation of career attitude maturity with the variable of consistency, decision, and realism in career choices (Crites, 1978). Cooter reported that an \( r \) of .38 \( (p < .01) \) was determined in comparing career attitude maturity and the Readiness for Vocational Planning scales by Gribbons and Lohnes (Crites, 1978).

Construct validity was determined by examining
(1) subject response bias, (2) correlations with other variables, and (3) experimental manipulations of counseling and didactic experiences (Crites, 1978).

In regard to response bias, Crites (1978) cited a number of studies by Carek, Sharf, Shirts, and Crites showing that response bias was not a factor in the scale and that it was construct valid in regard to this type of measurement error.

When correlating the **Attitude Scale** with other variables, it was found that the **Attitude Scale** correlated closely with similar variables such as intelligence ($r = .42$) and scholastic aptitude ($r = .45$) (Crites, 1978).

Crites (1978) reported that Cover, Harris, and Williams found the **Attitude Scale** scores positively correlated with grade point averages, persistence in college, success in vocational training, vocational success, and vocational satisfaction.

Tamminen and Miller, according to Crites (1978), found in factor analytic studies that the **Attitude Scale** had a strong correlation with indices of vocational immaturity (-.41), underachievement (.70), and unrealistic vocational choice (.41).

Studies conducted by Asbury, Bovee, Gilliland, Goodson, and Feldman and Marinelli involving experimental-interventive manipulations revealed significant growth in career maturity as measured by the **Attitude Scale** (Crites, 1978).
The Competence Test of the CMI was not as thoroughly researched as the Attitude Scale. The strategy chosen by Crites for selecting items was the same as that for the Attitude Scale.

Internal consistency coefficients were computed using the Kuder-Richardson-Formula 20 for performance across grade levels. With two exceptions, they range from .72 to .90 (Crites, 1978).

Crites (1978) held the same argument for rational-empirical validity of the Competence Test as for the Attitude Scale. He contended that the items made psychological sense and that they measured variables which changed systematically from grades six to twelve according to generally accepted patterns of developmental curves. This was also Crites' argument for criterion-related validity in that change in test performance related to the theoretical assumption of developmental change in the subjects. It was hypothesized for construct validity that the subtests of the Competence Test should be interrelated with r's ranging from .40 to .60. This was shown to be the case. Pearson r's for the intercorrelations of the subtests averaged .54 with a range from .25 to .73.

Design and Procedure

The nonequivalent control group and treatment group pretest/posttest design was used for this study (Campbell
The treatment consisted of the vocational course (AA-EVENT) designed to expose academically able students to emerging and new technologies in the fields of energy, ecology, and microcomputers. The dependent variables of career maturity were measured by Crites' Career Maturity Inventory. The administration of the CMI included both the Attitude Scale yielding a single score for maturity of career attitudes and the Competence Test yielding five scores in the areas of self-appraisal, occupational information, goal selection, planning, and problem-solving.

The treatment group consisted of 15 juniors and 19 seniors who elected to participate in the AA-EVENT course during the 1982-83 school year. From the 98 eligible students who were not enrolled in the AA-EVENT course, a stratified random sample was selected to obtain an equal number of participants matched by sex and grade level to serve as the control group.

The CMI was administered as a pretest/posttest measure to both the experimental and control groups. The pretest was administered during the second week of school to both groups. Students enrolled in the AA-EVENT course completed the pretest during their regularly scheduled class period. Students comprising the control group completed the pretest during one setting under the school's usual testing circumstances. The counselor in charge of the school's testing program administered the pretest.
The posttest was administered to both the experimental and control groups during the second week of May, 1983, following the same procedures as the pretest.

Hypotheses

The following null hypotheses were tested at the .05 level of significance:

1. There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Attitude" component of career maturity as measured by the Career Maturity Inventory.

2. There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Self-Appraisal" component of career maturity as measured by the Career Maturity Inventory.

3. There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Occupational Information" component of career maturity as measured by the Career Maturity Inventory.

4. There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Goal Selection" component of career maturity as measured by the Career Maturity Inventory.

5. There will be no significant difference between the scores of the experimental group and the scores of the
control group on the "Planning" component of career maturity as measured by the Career Maturity Inventory.

6. There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Problem Solving" component of career maturity as measured by the Career Maturity Inventory.

Statistical Analysis of Data

The nonequivalent control group design was used in this study as suggested by Tuckman (1978) for a study beginning with an intact group. Basically, this is a design in which an experimental group has received some type of treatment, and is then compared to a control group which has not received any treatment. The primary purpose of this type of design was to determine what effect the treatment would have upon the experimental group.

The raw scores from the CMI for each subject involved in this investigation were key-punched and verified on computer cards. Each subject's data-set indicated grade level, sex, and group within the research design. The Statistical Package for the Social Sciences (SPSS) computer program and the IBM 4341 computer at East Tennessee State University were used for the statistical computations in this study.

Analysis of covariance using pretest scores as a covariate of the posttest scores (Isaac and Michael, 1978)
was used to determine significance of the hypotheses concerning development of career maturity. A probability level of .05 was regarded as acceptable for determining statistical significance in order to reject or fail to reject each of the six null hypotheses.
Chapter 4

PRESENTATION OF DATA AND ANALYSIS OF FINDINGS

The primary purpose of this study was concerned with the effects upon the maturity of attitudes and competency in career decision-making skills of academically able high school juniors and seniors as a result of participation in an experiential based instructional program for exploring vocations in emerging and new technologies. Hypotheses were formulated as to possible differences between the experimental group and the control group after the experimental group experienced a full year course designed to expose qualified students to expanding career opportunities in the fields of energy, ecology, and microcomputers.

Crites' (1978) Career Maturity Inventory (CMI) was used as the instrument for evaluation.

Chapter 4 includes the restatement of the null hypotheses, the report of the results, and the analyses of the findings relative to the hypotheses.

The data gathered on the six hypotheses of interest to the study were tabulated. Results were based on the comparison of 32 treatment group students and 32 control group students. Two of the original 34 treatment group students were not included in the analyses. One student transferred to another school during the treatment program and another student did not complete the treatment program.
Treatment group students were those who participated in the AA-EVENT program during the 1982-83 school year. Control group students included those who were eligible but did not participate in AA-EVENT. They were assigned by stratified random sampling to the control group.

Test of Hypotheses

The analysis of covariance was the statistical measure utilized to test each of the six hypotheses. The pretest was used as a covariate of the posttest. The .05 level of significance was selected as the difference to be regarded as significant between the groups.

Hypothesis 1

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Attitude" component of career maturity as measured by the Career Maturity Inventory.

Results

The results relevant to Hypothesis 1 are presented in Table 1.
Table 1

Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Attitude" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>35.0313</td>
<td>8.2082</td>
<td>.0057</td>
</tr>
<tr>
<td>Experimental</td>
<td>37.3438</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis of Findings

The "Attitude Scale" consisted of 50 True-False items which surveyed the students' attitudes and feelings toward a career and toward entering the world of work. Possible scores ranged from 0-50 with a score of 0 indicating a low attitude, and a score of 50 representing a high attitude.

An F-ratio of 8.2082 was obtained for the "Attitude" posttest difference. The obtained ratio yielded a significance at the .0057 level for the "Attitude" component of career maturity.

The experimental group attained the higher mean, indicating that participants in the AA-EVENT program made significantly greater increase than non-participants in positive feelings, subjective reactions, and dispositions toward making a career choice and entering the world of work. The statistic employed with the data in Table 1
indicated a significance beyond the .01 level. Therefore, null hypothesis 1 was rejected.

Hypothesis 2

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Self-Appraisal" component of career maturity as measured by the Career Maturity Inventory.

Results

The results relevant to Hypothesis 2 are presented in Table 2.

Table 2
Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Self-Appraisal" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15.2500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>16.7813</td>
<td>7.2307</td>
<td>.0092</td>
</tr>
</tbody>
</table>

Analysis of Findings

The "Self-Appraisal" subtest was designed to measure students' self-knowledge in the process of career decision making. The students completed 20 stem-items which
described the psychosocial characteristics of a person in his late teens. The assumption in this subtest that students who can accurately appraise the career-relevant capabilities of others are good self-appraisers. In other words, the higher the student's raw score, the more knowledge the person possesses of himself.

An $F$-ratio of 7.2307 was obtained for the "Self-Appraisal" posttest difference. The obtained ratio yielded a significance at the .0092 level for the "Self-Appraisal" component of career maturity.

The experimental group attained the higher mean, indicating that participants in the AA-EVENT program made significantly greater increase than non-participants in the "Self-Appraisal" component of career maturity. The statistic employed with the data in Table 2 indicated a significance beyond the .01 level. Therefore, null hypothesis 2 was rejected.

**Hypothesis 3**

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Occupational Information" component of career maturity as measured by the *Career Maturity Inventory*.

**Results**

The results relevant to Hypothesis 3 are presented in Table 3.
Table 3
Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Occupational Information" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>17.9063</td>
<td>3.6138</td>
<td>.0620</td>
</tr>
<tr>
<td>Experimental</td>
<td>18.4063</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis of Findings

The "Occupational Information" subtest consisted of 10 vignettes of a worker on a job, and a description of what the worker does. The students' task was to answer the question, "What is the worker's occupation?", from the five possible alternatives that were given.

An F-ratio of 3.6138 was obtained for the "Occupational Information" posttest difference and 4.00 was needed for the acceptable .05 level. The obtained ratio yielded a significance at the .0620 level for the "Occupational Information" component of career maturity. The experimental group attained the higher mean, indicating that participants in the AA-EVENT program made greater increase than non-participants in knowledge of the world of work in relationship to the duties and tasks that workers perform. The gain, however, was not significant at the acceptable .05 level, and null hypothesis 3 was not rejected.
Hypothesis 4

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Goal Selection" component of career maturity as measured by the Career Maturity Inventory.

Results

The results relevant to Hypothesis 4 are presented in Table 4.

Table 4
Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Goal-Selection" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15.1250</td>
<td>3.5872</td>
<td>.0630</td>
</tr>
<tr>
<td>Experimental</td>
<td>16.3125</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis of Findings

The "Goal Selection" subtest consisted of 20 stem-items which illustrated various psychosocial characteristics of a person at work. The students had to choose an answer from five possible job alternatives, thereby matching up the job with the job description. The purpose was to be able to match the person with the job.
An F-ratio of 3.5872 was obtained for the "Goal Selection" posttest difference and 4.00 was needed for the acceptable .05 level. The obtained ratio yielded a significance at the .0630 level for the "Goal Selection" component of career maturity.

The experimental group attained the higher mean, indicating that participants in the AA-EVENT program made a greater gain than non-participants in development of their goal selection skills. The gain, however, was not significant at the acceptable .05 level, and null hypothesis 4 was not rejected.

**Hypothesis 5**

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Planning" component of career maturity as measured by the Career Maturity Inventory.

**Results**

The results relevant to Hypothesis 5 are presented in Table 5.

**Table 5**

Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Planning" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>15.0625</td>
<td>.2134</td>
<td>.6454</td>
</tr>
<tr>
<td>Experimental</td>
<td>15.2188</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Analysis of Findings

The "Planning" subtest presented 20 stem-items which illustrate the career goals of an individual. Five unordered steps to reach the goal were presented, and it was the student's task to select the correct order of the steps, thereby stressing the importance of planning in the sequence of career decision making.

An $F$-ratio of .2134 was obtained for the "Planning" posttest difference and 4.00 was needed for the acceptable .05 level. The obtained ratio yielded a significance at the .6454 level for the "Planning" component of career maturity.

Even though the experimental group attained the higher mean, the difference was not great enough to indicate that participants in the AA-EVENT program made significantly greater gain than non-participants in development of career planning skills. Therefore, hypothesis 5 was not rejected.

Hypothesis 6

There will be no significant difference between the scores of the experimental group and the scores of the control group on the "Problem Solving" component of career maturity as measured by the Career Maturity Inventory.

Results

The results relevant to Hypothesis 6 are presented in Table 6.
Table 6
Analysis of Covariance, Using the Pretest as a Covariate, of Differences in Posttest Scores on the "Problem-Solving" Component of Career Maturity

<table>
<thead>
<tr>
<th>Group</th>
<th>Posttest Mean</th>
<th>F-Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>11.4375</td>
<td>3.3124</td>
<td>.0737</td>
</tr>
<tr>
<td>Experimental</td>
<td>12.2813</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analysis of Findings

The "Problem Solving" subtest presented 20 hypothetical stems, and five alternative answers to the question, "What should he do?" The purpose of this test was to prove that the more career mature the student was, the better he would be able to solve problems relating to real life career decisions.

An F-ratio of 3.3124 was obtained from the "Problem Solving" posttest difference and 4.00 was needed for the acceptable .05 level. The obtained ratio yielded a significance at the .0737 level. Mean scores on the "Problem Solving" subtest were the lowest of all components of career maturity tested by the Career Maturity Inventory. The experimental group attained the higher mean, indicating that participants in the AA-EVENT program made greater gain than non-participants in ability to solve problems occurring in the career developmental
tasks one is expected to accomplish in preparation for entry into the world of work. The gain, however, was not significant at the acceptable .05 level and null hypothesis 6 was not rejected.
Chapter 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

Purpose

The primary purpose of the study was to determine if participation in an experiential based instructional program for exploring vocations in emerging and new technologies would enable academically able high school juniors and seniors to attain increased maturity of attitudes and competency in career decision-making skills as measured by the Career Maturity Inventory.

Treatment

The AA-EVENT program, designed and developed by six members of the staff of Greeneville High School, was used as the treatment for this research. The AA-EVENT program consisted of four types of modules incorporated into the learning modules. Through involvement in reading modules, investigative activities, experimental or constructional modules, and creative activities, the student was exposed to expanding career opportunities in the fields of energy, ecology, and microcomputers. The program was designed for the academically able student enrolled in either the junior or senior year of high school.
The AA-EVENT program was designed to stimulate and facilitate self/career exploration on the part of students. Goals of the program include helping students to expand their self awareness, develop career awareness, identify personally relevant career options, and begin exploring and evaluating career options.

**Measure**

The Career Maturity Inventory including the Attitude Scale and Competence Test was used as the dependent measure in the study. The CMI measures the maturity level of attitudes and competencies that are critical in realistic career decision making. The Attitude Scale measures the maturity of career choice attitudes. The Competence Test measures five career choice competencies to include: (1) self-appraisal, (2) occupational information, (3) goal selection, (4) planning, and (5) problem solving. The CMI provides a measure of the maturity of career choice attitudes and career choice competencies.

A basic assumption of the researchers who developed the CMI was that a person's level of career maturity develops over time. The concept of career maturity is used to denote the place reached by a person on the continuum of vocational development. It is the aim of the CMI to measure this development of career maturity in individuals and groups at different age and grade levels.
Design

The nonequivalent control group and treatment group pretest/posttest design was used in the study. The AA-EVENT program provided the treatment. The repeated measures were made using the CMI.

Procedure

The population for the study was comprised of 132 members from the 1982-83 Greeneville High School junior and senior classes who had been identified as having an overall grade point average that placed them in the top thirty percent of their respective classes. The treatment group consisted of 32 students who completed a year-long study in the AA-EVENT program. An equal number of participants was selected for the control group by taking a stratified random sample from the remaining population of eligible students.

A pretest using the Attitude Scale and Competence Test of the CMI was administered during the second week of school to both the treatment and control groups. The AA-EVENT program was administered over the next 32 weeks of school to the treatment group.

Students in the control group experienced none of the activities in which students in the experimental group were involved. The posttest was administered to both the experimental and control groups during the second week in May, two weeks before the school year ended.
Conclusions

Analysis and Results

Analysis of covariance was utilized as the statistical procedure to determine treatment effects using the pretest as a covariate of the posttest. Differences in posttest results were regarded as significant for p < .05.

The following results were obtained in this study:

(1) A significant difference (p < .01) was found between the experimental group and the control group on the Attitude Scale of the Career Maturity Inventory. It was concluded that participation in the AA-EVENT program enabled students to possess a more positive attitude toward the world of work than students in the control group.

(2) The experimental group's scores increased significantly (p < .01) compared to the control group on the "Self-Appraisal" subtest. Individual self-knowledge was extended as a result of participation in the AA-EVENT program.

(3) The experimental group had a greater increase than the control group on the "Occupational Information" subtest; however, the difference (p < .10) was not considered to be statistically significant. Knowledge of occupational information was increased for participants in the AA-EVENT program.

(4) The experimental group scored higher (p < .10)
than the control group on the "Goal Selection" subtest. Even though the difference was not significant ($p < .05$), it was concluded that participation in the AA-EVENT program enabled students to further develop their goal selection skills.

(5) The experimental and the control group had almost identical scores on the "Planning" subtest. Participation in the AA-EVENT program was shown to make little difference in development of career planning skills.

(6) Scores on the "Problem Solving" subtest were the lowest subtest scores attained by both the experimental and control groups in all of the five subtests of the Competence Test. The experimental group scored higher ($p < .10$) than the control group on the "Problem Solving" subtest. This would indicate that participation in the AA-EVENT program improved creative problem solving ability but not significantly ($p < .05$).

Recommendations

Based upon the findings of this study, some recommendations may be made for further study and research:

(1) Because the AA-EVENT program is an exemplary program in Tennessee and has not been thoroughly evaluated, further studies should be carried out to determine the program's effectiveness with other populations in other school settings.
(2) Even though career maturity covers a broad range of factors involved in growing up, entering the world of work, and becoming a productive citizen, there are many other factors that are influenced by one's learning experiences in school. Further studies should be conducted to identify other results from participation in the AA-EVENT program which make a significant contribution to the educational and career development of the academically able student.

(3) Evaluation studies need to be made on the effectiveness of other programs designed specifically to enhance the level of career/personal maturity of academically able students.

(4) The AA-EVENT program as a high school course should be considered for implementation in all high schools.

(5) The objectiveness of the AA-EVENT program should be utilized to develop a similar program to increase the career maturity of high school students not identified as academically able.

(6) A course or a unit of study on decision-making should be a part of every student's curriculum prior to the student's leaving the formal high school educational setting.

(7) Further study should be conducted in an effort to determine what factors are relevant to development
of career planning skills and how those factors can best be implemented in the instructional program.
REFERENCES
REFERENCES


Crites, J.O. Measurement of vocational maturity in adolescence: Attitude test of the vocational develop-


Ginzberg, E., Ginzberg, S.W., Axelrod, S., & Herma, J.L.


APPENDICES
APPENDIX A

AA-EVENT COURSE OUTLINE
Appendix A

AA-EVENT COURSE OUTLINE

I. ORIENTATION
   A. Mechanics
      1. Number of Modules
         a. Required
         b. Optional
      2. Evaluation Forms
         a. Teachers'
         b. Training Sponsors'
      3. Training Plan
         a. Insurance
         b. Agreement (including parental approval)
         c. Guidelines for Sponsor
      4. On-Site Opportunities
         a. 90 hours
         b. Locations
         c. Placement
         d. Responsible Behavior
   B. Exposure to Areas -- Microcomputers, Ecology, Energy
      1. Assessment of Attitudes
      2. Mind Stretching Activities
      3. Readings
      4. Discussion of Needs
         a. Past
II. BODY

A. Module Types
   1. Research (a) Readings (b) Surveys (c) Experimental
   2. Constructions
   3. Hands-on Experiences
   4. Group Projects
   5. Creative
   6. Student Generated
   7. Student Presentations to Students and Community

B. Class Activities
   1. Film
   2. Guest Speakers
   3. Field Trips
   4. Demonstrations

III. ASSESSMENT

A. Student Performance
B. Vocabulary of Each Module
C. History of Each Module
D. Open Ended Modules
E. Values
F. Controversies
G. Debate on Cost of Saving Energy Versus Loss of Jobs
H. Content Areas
I. Classify Things
J. Careers or Occupations
K. Occupational Hazards
L. Creativity
M. Group Modules
N. Individual Modules
O. Surveys of Homes and Businesses, Organizations, Churches
P. Construction Project
Q. Readings
R. Compilation of Pertinent Information About Company and Product, etc.
S. Fraudulent Use of Computers
T. Dictionary of Occupational Titles
U. Occupational Outlook Handbook
APPENDIX B

MODULES - AA-EVENT
MODULES - AA-EVENT

I. REQUIRED

A. At Beginning of Course
   1. Personal Values
   2. Public Values
   3. Business and Industry Information Survey
   4. Daily Log of Ecological Concerns
   5. Ecology Vocabulary
   6. Computer Vocabulary
   7. Energy Vocabulary
   8. History of Energy
   9. History of Computers

B. At End of Course
   1. Energy: What It Is; What It Does
   2. Meter Reading
   3. Energy Saving in the Home
   4. Careers in Computers
   5. Careers in Conservation
   6. Logging On
   7. Pollution Solutions
   8. Occupational References

II. ADDITIONAL

A. Energy
   1. Paraboloid Solar Collector
2. Electric Bill Calculation
3. Heating With Wood
4. Insulation
5. Your Home Heating Requirements
6. Solar Cooker
7. Color Absorption
8. Solar Water Heater
9. Flat Plate Collector
10. Convection Collector
11. Solar Heat
12. Collector Material
13. Sunshine and Shade
14. Energy-Saving Habits
15. Sources of Energy
16. Measure the Wind
17. Building a Windmill
18. Alcohol as a Fuel
19. Debate on Nuclear Energy
20. Concerns for Conserving Energy
21. Insulation and Energy
22. Solar Energy (in general)
23. Nuclear Fusion
24. Biomass
25. Science Fiction Story

B. Microcomputers
1. Processor Unit
2. Computer Crazies
3. Electronic Tutors
4. 2081
5. Programs for Plunder
6. Computer Music
7. Computer-Designed Parabolas
8. Future Computer Programs
9. Future of Computers
10. Computers in Banking
11. Word Processing
12. Computerized Development in Printing
13. Computer Cartoon

C. Ecology
1. Poison Eaters
2. Trash Survey
3. Ditch Inventory
4. Coal for Energy
5. Internships
6. Solar Still
7. Collecting Aluminum Cans
8. Solar Home Construction
9. Earth Shelters
10. Design of Energy Efficient Dwelling
11. Alternatives to the Gas Engine
12. Ecology Demands of the Future
13. Agriculture and Ecology
14. Pesticides, Herbicides, etc.
15. Stream Pollution
16. Ecology and Household Devices
17. Investigation of Current Controversies

D. Miscellaneous
1. Group Module
2. Jobs of the Future
3. On-Site Success
4. Written Inquiry Skills
VITA

HILTON A. SEAY

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- Public Schools, Greene County, Tennessee
- East Tennessee State University, Johnson City, Tennessee; mathematics, health education, B.S., 1961.
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- Teacher, St. James High School; Greene County, Tennessee, 1961-1962.
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