A COMPARISON OF THE PERCEPTIONS THAT DIFFERENT LEVELS OF MANAGEMENT IN THE BUSINESS SERVICES AREA HAVE CONCERNING SCANS COMPETENCIES AND FOUNDATION

By

RICHARD P. HERRMANN

Bachelor of Arts
San Jose State University
San Jose, California
1970

Master of Business Administration
San Jose State University
San Jose, California
1976

Submitted to the faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
May, 1993

OKLAHOMA STATE UNIVERSITY

A COMPARISON OF THE PERCEPTIONS THAT DIFFERENT

LEVELS OF MANAGEMENT IN THE BUSINESS

SERVICES AREA HAVE CONCERNING SCANS

COMPETENCIES AND FOUNDATION

Thesis Approved:

Thesis Adviser

Dean of the Graduate College

ACKNOWLEDGEMENT

The author would like to express sincere appreciation to Dr. Melvin D. Miller, Chairman of my committee, for his encouragement, guidance and support.

Appreciation is also extended to members of the advisory committee: Dr. Adrianne Hyle, Dr. Gary D. Oakley, and Dr. Ray Sanders.

A special appreciation is extended to the many business managers who valued this project and assisted by completing one or more of the research questionnaires.

Finally, the support and encouragement of my family is deeply appreciated.

TABLE OF CONTENTS

Chapter Page

LIST OF TABLES

CHAPTER I

THE PROBLEM

Introduction

We are living in a technological age where change in the workplace takes place at an ever increasing rate. Because of this change, the skills necessary for success in the workplace are also evolving. According to McLaughlin, Bennett, and Verity (1988), future jobs will be more complex. They will demand better basic skills. Over half the jobs created over this decade will require learning beyond the secondary level. Bailey (1990, May) reported that an analysis of occupational data shows that occupations that require higher educational levels are growing faster than those which require less education.

Carnevale and Gainer (1989, February) pointed out that the workplace is changing. Changes in the workforce due to trends such as participative management, sophisticated statistical quality controls, customer service, and international competition have led to the evolution of a workplace that needs a workforce that is capable of functioning in a more sophisticated and changing environment (Rosenfeld, 1988, June 22; U.S. Department of Labor, 1991, June; and National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, 1984).

> Consequently, the nation can no longer compete on the basis of low-wage/low-skill production, but must shift to a service-and information-based economy in which highly skilled persons and large doses of technology are the critical factors of production (Carnevale and Gainer; 1989, February; p. 4).

Change in the workplace is being complicated by changing demographics in the United States. At a time when business and industry is increasingly reliant on human capital, a satisfactory quantity of human resources available for entry-level jobs is declining. Moreover, the quality of entry-level employees is declining as more young workers are drawn from populations with insufficient human capital investments prior to work.

> As a result, the United States is facing a growing human capital deficit that threatens both its competitiveness and its ability to provide work for every able-bodied American (Carnevale and Gainer; 1989, February; p. 4).

A large segment of the American workforce consists of high school graduates who have not attended college. Furthermore, the nation's economic well-being depends on this group of workers. Studies have indicated that large numbers of high school graduates lack the basic educational skills that are essential for success in the workforce (Parnell, 1991). Because the preparedness of the workforce is a national agenda item, the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) was asked to research the demands of the workplace and whether schools are preparing students who are capable of meeting those demands. They found that half the students who leave schools do so without the skills to find and hold a good job (U.S. Department of Labor, 1991, June). Other recent surveys also indicate that employers are widely

dissatisfied with the educational quality of high school graduates and are critical of American education (National Academy of Sciences, National Academy of Engineering and Institute of Medicine, 1984).

Employer dissatisfaction may be a reflection of facts reported by Zemke (1989, June). He found that half of our nation's industrial workers are individuals that read at the eighth-grade level, and that each year another 2.3 million 16 year olds or older who are functionally illiterate join the nation's employment pool.

Additionally, Zemke (1989, June) stated that the world is aware of this nation's educational problem. Perry Pascarela, editor in-chief of Industry Week, said that an official of a German industrial-equipment company told him that:

> . . . the company couldn't sell its equipment in the United States because the latest production technologies available in Europe are too sophisticated for the United States. Operator skills and maintenance capabilities just aren't good enough to deal with these technologies (p. 35).

The writing on the wall indicates that the basics taught in public schools are not the basics needed for successful entry into the workforce and/or higher education (Zemke; 1989, June). As a result "by the year 2000, there are likely to be too few well-educated and well-trained workers to satisfy the nation's economic needs" (Carnevale and Gainer, February 1989, p. 1). Vocational educators often indicate that there seems to be more effort given to preparing students for college than preparing them for their role in the workplace (Scheuber, Trout, and others, 1991) even though

"skills learned in school and skills learned on the job are complementary" (Carnevale and Gainer, February 1989, p. 2).

At the present time, America is facing an economic crisis similar to the Sputnik era. Low productivity rates in this country translate to the reality that other countries are beating America in the high-tech and automotive industries. Clearly, schools are not producing the individuals needed to ensure America's ability to compete (Norton, Harrington, King-Fitch, and Kopp, 1987, p. 9). According to the National Center for Research in Vocational Education (1991, January), "evidence to date suggests that we need to rethink how to structure education . . ." (p. 1). An analysis of occupational data shows that the occupations that require higher basic skill levels are growing faster than those which require lower levels (Bailey; 1990, May). There are many calls for instructional reform (Stasz, McArthur, Lewis, and Ramsey; 1990, December).

The business services area will be one of the fastest growing segments of the job market and will be a focus of this study. Currently the business services area accounts for 4.2 percent of employment. This will increae to 5.2 percent by 2005 (Bureau of the Census, 1992, January). The projected number of new jobs in the business services area from 1990 to 2000 is 2,741,000, a more than 49 percent increase (Bureau of the Census; 1990, January). (See table no. 651 in Appendix A).

Background of the Problem

Over the past forty years, studies have explored the relationship between job performance and cognitive skills and abilities. These studies have shown that basic cognitive skills and abilities are directly related to job performance (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, 1984; Ghiselli, 1973; Hunter, 1980; Pearlman, Schmidt, and Hunter, 1981; Schmidt and Hunter, 1981; and Hunter and Hunter, 1982, June 21). For an individual to enter and play an adequate role in the workplace, the worker must have the knowledge, skills, and attitudes required to engage successfully in the day-to-day operations of the job (i.e., workplace basics) (Schnieders; 1989, December).

At the same time one can find a dismal picture of what our schools are doing. According to Kozol (1985, p. 8) "Sixty million U.S. adults cannot read newspapers, understand the antidote instructions on a can of kitchen lye, or read the warnings of the sedative effects of non-prescription drugs." Millions of these people are unable to help their children with school. Because of illiteracy, they are unable to participate and influence schools in the educational process.

The Carnegie Council on Adolescent Development in Turning Points: Preparing American Youth for the 21st Century (1989), claimed that our nation faces a paradox of our own making. Even though our economy seeks literate, technically trained, and committed workers, our society produces many young men and women who

are semi-literate or functionally illiterate, unable to think critically and untrained in technical skills. These individuals are hampered by high-risk life-styles, and alienated from the social mainstream. The Council went on to point out that unemployment rates for high school dropouts are much higher than those for high school graduates. These individuals often do not make enough to support a family. Many of these individuals develop a feeling that they are of little value to society.

The most current literature suggests that schools can better prepare individuals for the workforce by stressing the development of generic skills. According to Stasz, McArthur, Lewis, and Ramsey (1990, December), generic skills are comprised of both basic and enabling skills and complex reasoning skills. In addition, these authors included dispositions that influence task performance as necessary for proper performance in the workplace.

Thus, generic skills include traditional basic skills; skills for defining and solving problems, thinking critically, acquiring knowledge, and evaluating problem solutions; and motivation for choosing or doing a task along with the confidence in one's ability to do it (Stasz, McArthur, Lewis, and Ramsey (1990, December). It is on these generic skills that this study will focus.

Statement of the Problem

The specific problem dealt with in this study is that new entrants into the workforce lack generic workplace basic skills.

Purpose of the Study

The primary purpose of this research was to compare the perceptions of first-level managers (FLMs), persons responsible for human resource development (PRFHRDs) and site-level chief executive officers (SLCEOs) within the Business Services Industry Area of California concerning whether or not identified competencies are necessary for employee success in their firms. A secondary purpose of this research was to review evidence concerning the validity of the SCANS Report (U.S. Department of Labor; 1991, June) foundations and competencies as applied to the business services industry area.

Importance of the Study

Our nation's schools are seriously deficient in the development of common core competencies (generic skills) (National Academy of Sciences, National Academy of Engineering and Institute of Medicine, 1984). Because of this deficiency, it is important to identify changes in basic skills which should be taught in our schools to prepare youth for a smooth transition into the workplace. Furthermore, it is the acquisition of these generic skills that is essential for America to have a quality workforce.

According to the U.S. Department of Labor, U.S. Department of Education, and U.S. Department of Commerce:

> Our nation's economic strength and vitality, our productivity and international competitiveness, depend on our capacity to build and maintain a quality workforce. The foundation of a quality workforce rests with the ability of our nation's school systems to provide the

> basic reading, writing and mathematical skills as well as an appreciation for the work ethic, which our young people must possess to perform effectively in the workplace (McLaughlin, et al., 1988, p. 1).

Research to identify essential competencies across occupations is important in order for further building and maintenance of a quality workforce. Moreover, it is important that recommendations be made as to what skills, knowledge, and attitudes need to be developed and reinforced in our schools together with identifying strategies which teachers can use to assist learners in developing needed proficiency in the basic skills (Stasz, McArthur, Lewis, and Ramsey; 1990, December).

This research sought to advance knowledge concerning common workplace basic skills across occupations in the business services area. At the same time, descriptive information will be useful in future research identifying workplace basic skills common to most occupations.

Research Questions

The research was governed by five primary questions:

1. What are the perceptions of site-level chief executive officers (SLCEOs) concerning each individual competency's importance to employee success in the Business Services Area (BSI)?

2. What are the perceptions of persons responsible for human resource development (PRFHRDs) concerning each individual competency's or competency area's importance to employee success in the BSI?

3. What are the perceptions of first-level managers (FLMs) concerning each individual competency's or competency area's importance to employee success in the BSI?

4. What SCANS (U.S. Department of Labor; 1991, June) competencies are important across occupations in the business services area as judged by SLCEOs, PRFHRDs, and FLMs in a combined rating.

5. Do SLCEOs, PRFHRDs and FLMs share different perception concerning each individual competency's or competency area's importance to employee success? This question is answered by the research hypothesis.

Definitions of Terms

Basic or Enabling Skills: Reading, doing simple mathematics, and "life skills," such as reading a schedule, writing a check, or filling out an application (Stasz, McArthur, Lewis and Kimberly, 1990, December, p. 7).

Business Services Area: According to the Standard Industrial Classification (SIC) manual (1987),

> This major group includes establishments primarily engaged in rendering services, not elsewhere classified, to business establishments on a contract basis, such as advertising, credit reporting, collection of claims, mailing, reproduction, stenographic, news syndicates, computer programming, photocopying, duplicating, data processing, services to buildings, and help supply servers.

Over 100 types of business service descriptors are listed on pages 360 to 370 of the SIC Manual.

Complex Reasoning Skills: Formal and informal reasoning (Stasz, McArthur, Lewis, and Kimberly, 1990, December, p. 8).

Dispositions: Attitudes that can play an important role in how any skills are acquired and used (Dweck, 1986) (Stasz, McArthur, Lewis, and Kimberly, 1990, December, p. 8).

Formal Reasoning: A problem to be solved which specifies all premises or given information in advance (e.g., problems in logic, geometric analogies, series completion) (Stasz, McArthur, Lewis, and Kimberly, 1990, December, p. 8).

Generic Skills: Basic or enabling skills, complex reasoning skills, and dispositions that can be affected by training (Stasz, McArthur, Lewis, and Kimberly, 1990, December, p. 7).

Informal Reasoning: Premises which are not completely supplied for the problem, and which involve everyday thinking activities must be invoked (e.g., planning, making commitments, evaluating arguments, choosing options; see Galotti (1989) for a detailed discussion (Stasz, McArthur, Lewis, and Kimberly, 1990, December, p. 8).

Workplace Basics: Knowledge, skills, and attitudes required of an occupation in order for an employee to engage successfully in the day-to-day operations of the job (Schnieders, 1989).

Limitation of the Study

The research was limited to the business services area in California. One in 20 Americans work in the business services area (Bureau of the Census). According to the Occupational Outlook Quarterly (1987, Fall), this area will have one of the largest

employment growths of any area. Furthermore, statistics have shown that from 1970 to 1988, 3,648,000 additional new jobs were created in California in the business services area. This was more than a 360 percent increase over the period. This compared to only a 150 percent increase in jobs in the fast growing wholesale and retail trade. Moreover, approximately 13 percent of all business services firms are located in the State of California (Bureau of the Census, 1990).

The business services area in California has a slightly higher than average percentage of females, blacks, and Hispanics in its workforce. This slightly higher than average level (female, +1.7%; black, +1.6%; and Hispanic, -.1%) is not statistically significant, thus, the population of workers is representative of the state labor force (Bureau of the Census, 1992). (See Table No. 632 in Appendix A). The projected number of new jobs in the business services area from 1990 to 2005 is 2,374,000, a more than 45 percent increase (Bureau of the Census, 1992). (See table no. 633 in Appendix A).

The robust economy of California is forecast to continue to grow well into the next century. California is expected to continue to be number one in population growth, economic growth, job growth, and personal income growth for the next two decades. Nearly one in five new jobs created in the United States will be in California over the same time period.

> . . . 6.7 million new jobs are projected for the state between now and 2010. Already more people reside in the Golden State than in any other, but by 2010 13% of the U.S. population is expected to reside in California (up from 10% in 1970). Approximately 13% of total GNP

is produced in California . . . (Woods & Poole Economics, Inc., 1990, p. A11).

The State of California will be strongly impacted by the emerging needs of the workplace in relation to demographics. One source pointed out that current projections for California's K-12 student population growth run at about 160,000 students per year. The same author pointed out that: A large majority of these new students (80 percent in the 1989-90 school year) are ethnic minority pupils who are limited-English-proficient (Woods & Poole Economics, Inc., 1990, May).

Other limitations of this study include the facts that California was entering a recession when the study was conducted, the demographics of California are quite different than those of the majority of the United States, and the researcher lacks the financial resources to conduct an in-depth study.

Organization of the Study

The study is organized in five chapters. Chapter I is the Problem and includes the Introduction, Illiteracy in the Workplace, Background of the Problem, Statement of the Problem, Purpose of the Study, Research Questions, Definitions of Terms, Limitations of the Study, Organization of the Study, and Summary. Chapter II is the Review of Literature and includes the Introduction, The Forgotten Half, Basic Skills, Generic Skills, The Cost of Worker Deficiency in Basics Skills, The Challenge to Education, Education's Response, Implications for Curriculum and Methodologies, Learning, Integration of Academic and Vocational Education, Business/Industry and

Education Partnerships, and Summary. Chapter III covers Methodology and includes the Design of the Study, Hypothesis, Population and Sample Selection, The Research Instrument, Content Validity, Data Collection, Follow-up of Non-respondents, Single-Factor ANOVA Research Design, and Analysis of Data. Chapter IV covers the Presentation of the Findings and includes The Collection Procedure, Analysis of Data, Test of Hypothesis, and Demographic Data. Finally, Chapter V consists of Conclusions and Recommendations and includes the Summary, Conclusions, and Recommendations.

Summary

According to Stasz, McArthur, Lewis, and Ramsey (1990, December), the current support for school reform arises out of the urgency to prepare students for the workplace by emphasizing the development of generic skills. Because the term *generic skills* is not clearly defined, research that identifies generic skills is important to curriculum development.

This research attempted to identify more clearly generic skills within the business services area of California. It did so by both providing some validation for SCANS standards and competencies, and by comparing the perceptions that three levels of management have concerning the importance of identified generic skills. Data gathered in this research should be valuable for validating generic skills if there is parallel data gathered for other industries.

Emphasis in this study was on a comparison of the perceptions of different levels of management concerning generic workplace basic

skills. This study attempted to compare the perceptions of different levels of management in order to determine whether management level must be considered when conducting studies which identify generic workplace basic skill competencies.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The review of available literature provided the practical and theoretical reasoning underlying the problem as described in this research. It consisted of a review of appropriate literature in the form of books, journals, videos, government publications, newspaper articles, curriculum materials, and previous research. An ERIC search was completed as well as a bibliography of sources from U.S. government publications and Dissertation Abstracts on the topic. In addition, Bibliographical Sources, Card Catalog, National Union Catalog, Monthly Catalog of Government Publications, Education Index, Readers Guide, New York Times Index, Review of Educational Research, Education Abstracts, Journal of Educational Research, NEA Research Bulletin, Journal of Experimental Education, Research Quarterly, American Educational Research Journal, Dissertation Abstracts, Masters' Abstracts, Resources in Vocational Education, CIJE, and other related data bases were considered or reviewed.

Direct research on business and industry expectations of public schooling in teaching basic skills seems to be primarily limited to government contracted studies. The predominant government research methodology found in the review of literature was personal

interviews of chief executive officers, special business contacts and educators.

The United States Department of Labor (1991, June) in What Work Requires of Schools: A SCANS Report for America 2000 represents the beginning of a national effort to identify generic skills across occupations. A series of documents prepared by the Secretary's Commission on Achieving Necessary Skills, U.S. Department of Labor --What Work Requires of Schools (1991, June); SCANS Blueprint for Action: Building Community Coalitions (undated); and Skills and Tasks for Jobs: A SCANS Report for America 2000 (1992)--have been designed to assist in preparing workers for the new and emerging needs of an ever-changing workplace. Contained in Skills and Tasks for Jobs: A SCANS Report for America 2000 are the results of surveys covering several occupations and are similar to the survey in this study. Since Skills and Tasks for Jobs: A SCANS Report for America 2000 was reviewed after the questionnaire research activities of this study had been completed, there are some differences in the content of the surveys. In addition, SCANS interviews seemed to be limited to only a few per job title. It is interesting to note that there are many similarities which can be seen by comparing the SCANS rankings with the rankings as a result of this study. The review of literature includes the following sections: Introduction, Illiteracy in the Workplace, The Forgotten Half, Basic Skills, Generic Skills, The Cost of Worker Deficiency in Basics Skills, The Challenge to Education, Additional Discussion About the Challenge to Education, Education's Response, Implications

for Curriculum and Methodologies, Learning, Integration of Academic and Vocational Education, Business/Industry and Education Partnerships, and Summary.

Bailey (1990, May) emphasized reasons for significant changes occurring in the workplace. These changes are a result of the evolution of society, the economic position of the United States, technology, and the size and demographics of the workforce.

What can education do to prepare individuals for the changing demands of the workplace? Futurists have called for active learning, higher cognitive skills, service learning, lifelong learning, coping with diversity, general education, trans-disciplinary education, personalized learning, process approach (learn how to learn), education for communication, early childhood education, and whole person education (Benjamin, 1989). These solutions and others are reviewed later in this chapter.

Illiteracy in the Workplace

For years there has been concern about illiteracy in the workplace. Kozol (1985) pointed to the fact that one-third of the United States population is functionally illiterate and unable to read and carry on other basic survival functions. This is a staggering deficiency in light of the increased need for workers with good basic skills in the workplace (Carnegie Council on Adolescent Development Task Force, 1989).

The condition of being illiterate has a tendency to perpetuate itself. As Kozol (1985) pointed out, sixty million U.S. adults lack

the skills to function well in their environment. Illiterate parents are unable to read to their children and assist them in school work. Additionally, "They have no means by which to denounce the manifest deficiencies of the curriculum, administrator, or teaching staff to which their children are entrusted" (p. 8).

The issue of literacy was dealt with by the Carnegie Council on Adolescent Development in Turning Point: Preparing American Youth for the 21st Century (1989). This group pointed out the paradox of having an economy that seeks literate, technically trained, and committed workers, while having an educational and social system that produces many men and women who are semi-literate or even functionally illiterate. The group went on to point out that "unemployment rates for high school dropouts are more than twice those for high school graduates" (p. 26). The group further pointed out that the American dream is spoiled for many individuals by the fact that the jobs the illiterate of America are finding pay too little for them to raise a family. It is evident that educating the illiterate of this nation is a problem. Authorities are concerned about the direction public education is taking in preparing students for the workforce of today and tomorrow.

Woodring (1983) explained that the problem with illiteracy is not the result of a greater percentage of individuals being illiterate. It is, rather, that the demands of the workplace have changed. "The evidence is that illiteracy has declined steadily for the past two centuries" (p. 106). The need in the workplace for higher levels of literacy is greater. The biggest concern is for

those among us who are handicapped by illiteracy (Norton, Harrington, King-Fitch, and Kopp, 1987).

The Forgotten Half

As identified in the introduction, there is a workforce problem in the United States. The basic skills possessed by many entry-level workers do not meet the needs of the new and emerging workplace. As technology and demographics change, so should schooling in preparing citizens for society and the workplace (Carnevale and Gainer; 1989, February). Unfortunately, according to many educational theorists, schools usually teach to the best or the disadvantaged, and the remaining students are forgotten (Parnell, 1991). The U.S. News & World Report (1989, June 26) reported that nearly 80% of those forgotten half (students who are in the mid range of ability or performance) are White with the remainder being Black and Hispanic.

According to the article "The Forgotten Half" in U.S. News & World Report (1989, June 26), President George Bush when speaking to East Los Angeles Barrio pointed out that "the nation will need millions of workers without baccalaureate degrees in the 1990's" (p. 45). The article went on to point out that there will be a shortfall of over twenty million workers in this country during the early 1990's. It stated that the skills hurdle is pronounced in the services sector and that overall, the need for higher qualifications is rising more rapidly than ever in middle and low-wage jobs. The article stressed that few categorized in the forgotten half either

possess or are receiving the training necessary for the more complicated jobs of the future.

Basics Skills

Bailey (1990, Spring), supports the importance of basic skills. The age of technology along with changes in the economy and our changing demographics has created a situation where attention to basic skills is essential.

Basic skills are not always defined the same way. Most authors agree that the basics include reading, writing, and mathematics. At the same time, others either limit or expand the definition of basic skills. For example, According to Teachers Teaching Thinking, a video produced by the Illinois Renewal Institute, Inc. (undated), one basic skill is critical thinking and includes brainstorming, classifying, and evaluating.

This definition extends the concept of basic skills to include the traditional 3 R's and critical thinking/problem solving.

The Center for Public Resources, defined basic academic skills broadly:

> . . . in addition to the three R's, sciences at the high school level were considered essential as well as the skills of speaking, listening and reasoning or critical thinking.
>
> To ask a question clearly and coherently, to follow instructions, to draw a reasonable conclusion from information given--all were cited as examples of basic abilities needed (Eurich, 1985, p. 10).

The National Center for Research in Vocational Education (1987b) presented an adaptation from the National Council of

Supervisors of Mathematics (1979) that gave a definition of basic skills in the mathematics area. They did this by listing the following ten basic skills:

1. Problem solving. Problem solving is the process of applying acquired knowledge to new and unfamiliar situations.

2. Applying mathematics to everyday situations.

3. Alertness to the reasonableness of results.

4. Estimation and approximation.

5. Appropriate computational skills. This includes facility with addition, subtraction, multiplication, and division with whole numbers and decimals.

6. Geometry. This includes point, line, plane parallel, and perpendicular three dimensional concepts.

7. Measurement. This includes measurement of distance, weight, time, capacity, temperature, angles, areas, and volumes.

8. Reading, interpreting, and constructing tables, charts, and graphs. This includes the ability to set up simple tables, charts, and graphs.

9. Using mathematics to predict. This includes probability.

10. Computer literacy. At least at the awareness level (p. 106-107).

Rosenfeld (1988, June 22), implied that educators review the basic skills as they prepare individuals for the workforce. Basic skills were related to the importance of a workforce prepared in much more than the traditional basics. He maintained that firms using new technologies want a different type of worker with an education appropriate for an automated system. He stated that firms want workers with broader skills and knowledge. He further maintained that just-in-time inventory, methods for reducing the

need to maintain stock, statistical process control for sampling products and understanding variations in quality, participatory management, and customized production all have made it important to have employees with strong basic skills. He further maintained that most workers lack the mathematical and scientific skills for the companies listed statistics and process control, and manufacturing concepts, including micro-economics, basic electronic theory and communications, as desirable skills for employees. He also emphasized employers' desire for employees with the willingness to accept responsibility, ability to solve problems, and readiness to take initiative.

Job specific skills are not the issue when determining basic skills. In an effort to give evidence that job specific skills are not the issue, Rosenfeld (1988) pointed out that with the new technology nearly 95% of the job-specific skills must be learned on the job.

Attitudes may also be closely related to success in the workplace. According to the Northwest Regional Educational Laboratory (1982, November):

> Employers often claim that one of the chief causes of high job turnover among youth is their lack of a sense of responsibility. This perception can lead to youth not being hired or to their being fired after only a few months on the job (p. 1).

The Northwest Regional Educational Laboratory (1982, November) also pointed out that parents, educators and employers all need to develop new strategies for helping young people develop responsibility. Specifically, we should ask: What role can the

need to maintain stock, statistical process control for sampling products and understanding variations in quality, participatory management, and customized production all have made it important to have employees with strong basic skills. He further maintained that most workers lack the mathematical and scientific skills for the companies listed statistics and process control, and manufacturing concepts, including micro-economics, basic electronic theory and communications, as desirable skills for employees. He also emphasized employers' desire for employees with the willingness to accept responsibility, ability to solve problems, and readiness to take initiative.

Job specific skills are not the issue when determining basic skills. In an effort to give evidence that job specific skills are not the issue, Rosenfeld (1988) pointed out that with the new technology nearly 95% of the job-specific skills must be learned on the job.

Attitudes may also be closely related to success in the workplace. According to the Northwest Regional Educational Laboratory (1982, November):

> Employers often claim that one of the chief causes of high job turnover among youth is their lack of a sense of responsibility. This perception can lead to youth not being hired or to their being fired after only a few months on the job (p. 1).

The Northwest Regional Educational Laboratory (1982, November) also pointed out that parents, educators and employers all need to develop new strategies for helping young people develop responsibility. Specifically, we should ask: What role can the

home, school and workplace play in providing opportunities for the development of responsible behavior in youth?

Generic Skills

Generic skills are needed by a great majority of individuals in order to function in the workplace. Generic skills are those workplace basic skills that are valid across occupations within the workplace. Much current research is being done in the area of generic skills. Stasz, McArthur, Lewis, and Ramsey (1990, December) maintained that instruction should emphasize generic skills as much as or more than it does skills that are specific to an occupation. These authors take the position that generic skills will enable people to be more effective group problem-solvers; identify and define problems more effectively; seek, acquire and synthesize new information; and adapt to changes or lack of information in the problem-solving environment.

Stasz, McArthur, Lewis, and Ramsey (1990, December) reported that there are two categories of generic skills: (1) basic or enabling skills (abilities ranging from reading and simple mathematics to life skills, and (2) complex reasoning skills. In addition to these skills, the same authors reported that dispositions that influence task performance (i.e., motives and confidence) could affect one's ability to learn and complete tasks.

Stasz, McArthur, Lewis, and Ramsey (1990, December) stated that employers are concerned most with complex reasoning. They identified these complex reasoning skills as:

1. Recognition of the problem
2. Analysis of the problem
3. Generation of solution paths
4. Evaluation of (partial) solutions paths or monitoring as one goes.
5. Repair
6. Reflection (after a solution is achieved) (p. VI).

SCANS research has made an attempt to identify generic workplace basic skills. This research supports the concept that job performance involves two elements: competencies and a foundation. The competencies include areas such as resources, interpersonal skills, information, systems, and technology. The three elements of the foundation include basic skills, higher order thinking skills, and diligent application of personal qualities (U.S. Department of Labor; 1991, June). (See Appendix B for an example of definitions of SCANS competencies and foundation.)

The Cost of Worker Deficiency in the Basic Skills

The cost of worker deficiency in basic skills is great. As Zemke (1989, June), pointed out, "adult illiteracy cost the United States $225 billion annually" (p. 35). The Carnegie Council on Adolescent Development (1989) in Turning Point: Preparing Youth for the 21st Century maintained that each year's class of dropouts will cost the nation about $260 billion in lost earnings and forgone taxes. A male high school dropout will earn $260,000 less than a high school graduate, and contribute $78,000 less in taxes. A

female who does not finish high school will earn $200,000 less, and contribute $60,000 less in taxes. The unemployment rates for high school dropouts are more than twice those of graduates. Between 1973 and 1986, young people who did not finish high school suffered a 42 percent drop in annual earnings in constant 1986 dollars. Each additional year of secondary education reduces the probability of public welfare dependency in adulthood by 35 percent.

It has also been shown that a clerical worker with a 100-point improvement in math and verbal SAT scores can be 15 percent more productive (Sechler and Crowe, 1987). As explained by Drucker (1989), United States workers need first rate basic educations.

A recent study for the U.S. Department of Labor looking at the skills required for 12,000 existing jobs indicated that skill levels on those jobs require a skill level of 3.0, which is defined as the ability to read safety instructions and maintenance manuals and write business letters. The same researchers estimate that in the year 2000, the actual skill level of workers will average 2.6 on that same six-point scale. In other words, given current trends, jobs of the future will require a greater skill level than our current educational system will produce (Zemke; 1989, June).

Furthermore, Zemke (1989, June) estimated that the skills deficit has already cost business and taxpayers $20 billion in lost wages, profits and productivity. Zemke (1989, June) cited Swenson who added the costs of the skills deficit to the costs of productivity and tax-revenue losses. Swenson arrived at an estimate that adult illiteracy costs the United States $225 Billion annually.

Zemke (1989, June) pointed out these examples of the concern by industry: Ford Motor Company offers reading courses in 25 plants; the United Auto Workers are establishing schools where union members can earn high school equivalency degrees; AT&T is spending $6 million a year on remedial courses for employees; Aetna Life and Casualty reported that in 1988 it spent $750,000 to teach 500 employees basic reading, writing and math skills; and Hewlett-Packard recently spent $22,000 at one facility to teach 30 supervisors high school math.

The Challenge to Education

We are now living in a world where human resources are of vital importance in determining our country's position in the world economy. In order to succeed in an increasingly competitive international marketplace, our firms must have the best-trained and most-skilled workers. These workers must rely on the public education system to give them the basic communications and critical thinking skills needed to keep up in a rapidly changing workplace (Smith; 1991, February/March).

In one study (Eurich, 1985), corporate responders and school system administrators showed disturbing discrepancies in their attitudes about the importance of basic abilities for getting and holding a job. It was reported that the greatest divergence was in the areas of mathematics, science, and speaking-listening skills. Corporate executives were deeply concerned about low level skills and school officials evaluating students as being adequately

prepared to meet employment requirements when they really were not. Moreover, business responders expressed serious concern about the impact of deficiencies not only on employability, but also on retention and upward mobility.

Business and industry suggest many challenges for education. First, business/industry challenges is for schools to improve the literacy of future workers in the workplace. "Employers want to hire graduates who have a strong foundation in basic skills and who can apply those skills to solve problems in an increasingly technological world that demands great flexibility of workers" (Pritz and Crowe, 1987, p. ix).

The Business Council for Effective Literacy (BCEL) in New York City says 27 million Americans are functionally illiterate. The U.S. Department of Education estimates that the functionally illiterate now account for about 30 percent of the unskilled workers, as great a percentage of the semi-skilled workers, and 11 percent of all managerial, professional and technical employees. Furthermore, the lethal combination of a shrinking labor pool and an abundance of jobs has stripped organizations of the luxury of selectivity (Zemke; 1989, June).

Second, according to Pritz (1989, August), business and industry challenge education to assist students in the development of higher order thinking skills which are necessary in most jobs of the future. In addition, all students graduating from high school should have a combination of basic skills qualifying them for socialization and the workplace. Employees are expected to reason

and develop logical steps for solving problems, no matter what their job category. The United States needs a workforce capable of critical thinking and creative problem-solving; however, we continue to educate youth for the smokestack economy of generations past (Carnegie Council on Adolescent Development (1989, June).

As publicized in U.S. News & World Report (1989, June 26) business and industry challenges public education to place an emphasis on preparing all students for their role in both society and the workplace.

> Many educators seem to measure their success by the number of higher ability students that go on to post-secondary training in elite colleges, not by what they do for the average or failing students. Surveys show that teachers and guidance counselors rank securing a job for students as their last priority (p. 48).

Even educational reform seems to very rarely help the struggling student. Schools attempt to seek excellence by raising the hurdle rather than working directly with the individual needs of the student (Scheuber, 1991).

As indicated by Carnevale and Gainer (1989, February), there is an increasing need to focus reform on special needs populations. High school graduates that do not go on to post-secondary education require special attention. It is these individuals who need the most attention to make our workforce competitive in a global economy. The 43 percent of students who are tracked into general curriculum and the 19 percent who are in vocational courses need a new curriculum that includes both academic basics and applied learning.

Furthermore, Carnevale and Gainer (1989, February) pointed out that it is the high school graduates not going on to post-secondary education who will require special attention. According to Carnevale and Gainer, the United States is competitive in the educational preparation of white-collar and technical elites, but does a poorer job at providing training in basic skills and occupational training to non-college-bound youth.

According to the National Center for Research in Vocational Education (1987b), business and industry challenges educators to make education experiential with application to the workplace. Good grades are not synonymous with being able to apply knowledge, and problem solving is integral to using basic skills effectively. It is important for students to recognize the varied roles played by basic subjects like mathematics in society. Students should understand the role of mathematics in scientific research as it is applied to the needs of society. "Students' experiences in school must bring them to believe that mathematics has value for them, so they will have the incentive to continue studying mathematics as long as they are in school" (p. 19).

Employers feel that schools should give students a workplace experience (Eurich, 1985). They should do this by exposing students to the expectations of the workplace, providing exposure to business, and working closely with employers as part of the educational process.

Carnevale and Gainer (1989, February) pointed out that employers depend on educators to provide job-ready and training-

ready employees. Carnevale and Gainer claim that educators need to change their strategy. They need to work with employers to strengthen the integration of learning in school and learning on the job. Schools need to hire better-prepared teachers, pay them what they are worth, and measure learning outcomes. Educational institutions need to link the teaching of academic subjects to real-world applications. Finally, schools need to help teach future employees how to make decisions, how to solve problems, how to learn, how to think a job through from start to finish, and how to work with people to get the job done.

There are many additional recommendations that come as a result of the business/industry challenge. The Northwest Regional Educational Laboratory (1983, November) recommended that education take note of the national best seller In Search of Excellence: Lessons From America's Best-Run Companies by Thomas J. Peters and Robert N. Waterman, Junior. The Northwest Regional Educational Laboratory maintains that the principles expressed by Peters and Waterman provide useful in-sights for improving education. These recommendations included:

1. A Bias for Action. Education seems to study things "to death." Many actions by education could be based on approximations in order to solve problems.

2. Close to the Customer. Educators need to be responsible to both students and the public (student oriented schools).

3. Autonomy and Entrepreneurship. Private schools financed through a voucher system and recognition of the individual ability of teachers may assist in improving education.

4. Productivity Through People. Quality teachers should be rewarded.

5. Hands-on, Value-driven. This could include involving teachers in the goal-setting process.

6. Stick to the Knitting. Concentration in schools should be in providing an education.

7. Simple Form, Lean Staff. Schools should keep central office staff to a minimum.

8. Simultaneous Loose-Tight Properties. Decision making at the local level should be encouraged. Involve all staff in the decision-making process.

Another organization, the California Business Roundtable, calls for,

1. making education a top policy priority.

2. a recognition by schools of business' entry-level requirements and a commitment to producing students who meet them.

3. an active role by business in working with and supporting schools to ensure that improvements are made and that business' requirements are met.

4. major changes in schools based on decentralization, deregulation, flexibility, parental choice and accountability (Smith; 1991, February/March; p. 11).

Additional Discussion About the Challenge to Education

It might be said that this entire matter of the school's role in preparing an effective workforce is a purpose of schooling issue. From a pragmatic view, the school should prepare individuals for the workplace if the community process indicates that there is value in that role (Miller, 1992). Evans (1971) takes the stance that if we do not want to tell students an untruth, we need to make sure that all education is relevant.

Should business/industry be asked to step in and assist schools in determining how to educate its student clients? A quotation found in the "Somebody Said" section of Thrust for Educational Leadership reported that Sam Ginn, chairman and CEO of the Pacific Telesis Group (1991, February/March) maintained that the business community can't dictate to schools what they need to do. He maintained that each school's client group is different. Businesses need to support schools, but educators have to develop their own plans and their own solutions to educational problems. Ginn was reported to have said that the free schools are from external controls, even from the district office, the more likely they are to be effective. Rosenfeld (1988, June 22) pointed out that it is up to educators to institute changes in the comprehensive high schools and elementary schools.

Eurich (1985) maintained that business and industry may be taking on the task of solving the problem if educators do not take the bull by the horns and restructure education to prepare

individuals better for the workplace, business/industry may take on the task of doing the job itself. According to Eurich (1985), proof of public education's failure to prepare students in basic skills for application to the workplace can be inferred by the following courses being offered by various companies:

MANUFACTURERS HANOVER

1) Effective Communications - Listening
2) Basic Arithmetic
3) Basic Speech - Grammar, Spelling, Punctuation
4) English as a Second Language I, II, III
1) Shorthand - Dictation and Dictaphone
2) Typing including Statistical Typing
3) Basic Writing Skills - Letter, Memo, Reports (especially for technical professional personnel)

POLAROID

1) High School Chemistry and Physics
2) Algebra and Trigonometry
3) Metric System
4) Literacy Training Tutorials
5) Reading Labs

NCR

1) Basic English Grammar
2) Effective Business Writing
3) Effective Technical Writing

IBM: SOFTWARE ENGINEERING INSTITUTE

1) Self-study courses in Algebra, Math Preparation and Review, Logical Expression

AMERICAN INSTITUTE OF BANKING--NEW YORK CITY

1) Reading and Study Skills Development
2) Reading and Writing English Skills for the Foreign Educated
3) Conversational English for the Foreign Educated
4) Speech

CHRYSLER CORPORATION

1) Reading Skills
2) Introduction to Writing
3) Writing Skills
4) Speech Skills
5) Accelerated Reading

CONSOLIDATED EDISON

1) Effective Reading
2) Effective Listening

STANDARD OIL OF CALIFORNIA

1) Better Letter Writing
2) Put it in Writing
   Technical Writing
3) Practical English and the Command of Words
4) Effective Communicating (pp. 61-63)

Eurich (1985) maintained that the content of the above listed courses, which are basic skills related, should not have been so essential and prevalent in corporate education catalogs.

What can we learn from training which takes place in business in industry? Resnick (1987, December) noted four fundamental differences between typical training in schools versus typical training in business and industry. First, while the primary focus in schools is on individual learning, activities for learning in business are often socially shared. Second, school learning is usually theory-based, while learning in business and industry is dependent on the ability to apply learning. Third, school learning often deals with the abstract, while business and industry learning deals primarily with solving problems, taking action, and using tools. Finally, while the objectives of schools are to deal widely with usable knowledge and skills, business and industry must often focus on the development of situation specific competencies.

According to Stasz, McArthur, Lewis and Ramsey (1990, December), this suggests that there is a need for more emphasis on group learning and application.

Education's Response to the Challenge

California, the state with the largest educational system, has the following policy concerning education and the workplace:

> It is the policy of the people of the State of California to provide an educational opportunity to the end that every student leaving school shall have the opportunity to be prepared to enter the world of work, and that every student who graduates from any state-supported educational institution should have sufficient marketable skills for legitimate remunerative employment.
>
> All students need to be provided with opportunities to explore and make career choices and to seek appropriate instruction and training to support those choices (Section 5100 of the California Education Code).

As put by Ernest Boyer (1983), high schools should help all students move with confidence from school to work and post-secondary training. He stated that we are tracking students into programs for those who "think" and those who "work," when, in fact, life for all is a blend of both. Only by proper planning and the teamwork of administrators, counselors, and teachers will the goal of basic skills for the greatest number of students be accomplished.

Boyer (1983) also reported that until the year 2000, for most students, twelve years of schooling will be sufficient. Today's graduates will change jobs several times, new skills will be required, and new citizenship obligations will be confronted. Education will be lifelong by necessity.

According to Norton, Harrington, Fitch, and Kopp (1987), the excellence movement has offered many suggestions for increasing academic requirements and decreasing electives, including vocational and technical education. Solutions of this type raise concern among those who feel that increased academic course work will not serve the needs, interests, and abilities of all populations. Many students are motivated to take those courses that they view as occupationally relevant.

Emphasis on academics was proposed by the National Commission on Excellence in Education (1983) in the Nation at Risk. They declare that schools must as a priority provide the "Five New Basics" which include four years of English, three years each of math, science, and social studies, and 1/2 year of computer science. All other subjects were to come second with an allowance made for the taking of electives.

Earlier, Adler (1982), in his Paideia Proposal, called for a uniform academic course of study for all students with the virtual elimination of any sort of choice from the curriculum. These academically oriented proposals reflect traditional theory which emphasizes starting with the academic basics before tackling other educational problems.

By contrast, Gerald W. Bracey, Director of Research and Evaluation for Cherry Creek (Colorado) Schools maintains that we may be missing the boat and should be teaching higher order thinking skills prior to teaching subject matter. Gerald W. Bracey quoting NAEP, reported that children can and do learn large chunks of very

difficult material very early. Lower-order (basic skills) are not necessarily the building blocks necessary to mastering higher-order skills. He stated that learning is not the linear process as popularly perceived by the public (Bracey, April 5, 1989). Bracey further maintained that the C.A.T. and the C.T.B.S. can't measure whether children have basic skills because the items on these and other similar tests are selected so that 50 percent are missed by test takers. As a result, mastery cannot be determined from such tests (Bracey; 1989, April 5).

According to Norton, *et al.*, (1987), the purpose of schooling is to (1) liberally educate students, with a world view and historical view beyond the limited menu offered by television; (2) academically prepare students, with the basic math, science, and communication skills needed to survive and thrive in today's society; and (3) prepare students for entry into the world of work with the technical and employment skills required.

Sechler and Crowe (1987) add to these views of the need for educational reform. They emphasized that listening to employers reveals the importance of basic skills, and remind teachers that it is in the workplace, not the classroom, where students will spend four-fifths of their lives.

In Turning Point: Preparing American Youth for the 21st Century, characteristics associated with being an effective human being were identified as having implications for education. The effective human being includes,

1. Intellectually reflective person

2. Person enroute to a lifetime of meaningful work

3. A good citizen

4. A caring and ethical individual

5. A healthy person (Carnegie Council on Adolescent Development; 1989, June; p. 2)

Envisioning future education, the Carnegie Council on Adolescent Development (1989, June), while describing the high school graduate of the 21st Century, emphasized that each student will understand the importance of an education as a prerequisite to being competitive in the adult workforce and will begin to understand the advantages of education past high school. Most importantly, students will need lifelong learning skills, an important capacity because of the changing nature of occupations and jobs. Finally, the student will have an education that maintains all career options.

Students learn differently, but teachers may not use methods that appeal to these different learning styles. According to Sechler and Crowe (1987):

1. Students learn in different ways and with varying degrees of flexibility

2. Teachers appear to accept and implement far fewer instructional practices at the secondary level than at the elementary level

3. School environments tend to favor students who are analytical, task-oriented, comfortable with abstractions, verbal, and reflective and who organize sequentially and have longer attention spans.

4. Experiential learning is necessary for optimum brain functioning (p. F-2).

Kozol (1985, March 13) alluded to the fact that many educators, especially in higher education, seem uninterested in doing something about the lack of basic skills in U.S. citizens. He claims that all educators should be responsible for teaching basic skills; however, there are different viewpoints by educators on the matter. As put by Norton, *et al.* (1986), educators in various fields have something to offer. English and math teachers, reading and language specialists, vocational teachers, and administrators should all be part of a team approach to improve instruction by doing a better job of teaching basic skills.

The dropout rate is a concern of many educators. The National Center for Research in Vocational Education (1987b) in The Bridger's Guide, Roadsigns from Research section, indicates that today's drop-out rate is not greater than in the past; however, because of new and emerging technology, there is a need for a greater number of workers with good basic skills than ever before.

According to the Northwest Regional Educational Laboratory (1982, November), many educators feel that schools cannot teach responsibility; they can only provide opportunities for students to become responsible. For example, educators can:

1. Provide greater consistency in discipline
2. Provide greater expectations concerning student attendance
3. Give students more responsibilities
4. Reward students with more freedom if they fulfill responsibilities
5. Use individualized projects
6. Implement a well-understood student accountability program

7. Infuse the concept of responsibility into classes

8. Encourage extracurricular activities that promote responsibility (Northwest Regional Educational Laboratory; 1982, November).

Schools have responded to the challenge of improving basic skills in a variety of ways (National Center for Research in Vocational Education, 1987b):

1. Forty-two states' solutions have been to increase certification standards.

2. Forty have increased the number of academic courses required for graduation.

3. Thirty-two have changed curriculum standards required for graduation.

4. Thirty-two have changed curriculum standards or textbook adoption procedures.

5. Twenty-four have lengthened the school day or year (p. 3).

At the local level, the Los Angeles Unified School District has approved a plan designed to guarantee business and industry that by 1994 and later, graduates are ready for the workplace (Association of California School Administrators; 1981, November 25). If graduates do not perform satisfactorily in the workplace, the district will provide free training at no cost to the employer. High school diplomas will include a written warranty that graduates are proficient in SCANs competencies and foundations (Association of California School Administrators; 1981, November 25).

Implications for Curriculum and Methodologies

Teachers in all subjects need to recognize the interrelated role of basic skills within their subject matter and adopt a willingness to help students to develop stronger basic skill foundations (Ascher and Black, 1986, May; and California State Department of Education, 1992). The cited authors all maintain that basic skills can best be reinforced through applied academics or vocational education.

Akyeampong (1986) cited Eurich's (1985) projections dealing with implications for education as a result of increases in corporate training. He maintained that schools should give students a stronger foundation in the basic academic skills. He further emphasized that school-industry cooperation must go beyond the current vocational training emphasis. Methods used in the corporate classroom should be explored in order to improve instruction.

Robert J. Marzano and Robert W. Ewye (1989), senior program associates at the Mid-Continent Regional Education Laboratory in Denver, Colorado, suggested integration of the following thinking skill areas in programs:

<u>KNOWLEDGE EXTENSION SKILLS</u>

1) Composing: Creating a new product using known information

2) Problem Solving: Obtaining a goal by overcoming some obstacle.

3) Scientific Inquiry: Identification of the underlying principles of some phenomenon, making predictions based on those principles, and testing the accuracy of those predictions.

ENABLING SKILLS

1) Comparing: Identifying the similarities and differences between two or more items of investigation.

2) Classifying: Grouping items into categories.

3) Inducing: Inferring unknown principles from examples of observation or analysis.

4) Analyzing Errors: Identifying mistakes in one's own thinking or someone else's.

5) Supporting: Offering facts and principles a evidence for a stated conclusion.

6) Abstracting: Identifying the underlying principles and concepts for a specific set of information (pp. 28-31).

J. P. Gulliford (1959) developed a three dimensional conceptual model called the "structure of intellect" with which he predicted the existence of at least 120 distinct types of intellectual ability. This is an example of how detailed a list of competencies can be when identifying components which are basic skills, especially in the higher-order thinking skill category.

The National Center on Research in Vocational Education (1987b) gave a view of what makes a person technologically literate. Listed were the following generic skills/attitudes and what can be done in a language arts class to promote technological literacy:

Generic Skills/Attitudes

1. Accuracy: Neatness in written work, proper grammatical usage, and correct spelling.

2. Planning Ahead: Helping students develop personal schedules for timely work completion, including reading and preparation.

3. Creativity/Imagination: Helping students think through non-traditional approaches to a required project.

4. Ethical Standards: Holding a discussion on why copying a copyrighted work is a problem.

5. Lifelong Learning: Talking about how and why people read books and enjoy TV, movies and plays as a balance in their lives and as a way to learn new things.

6. Systems Thinking: Requiring team work and coordination of many tasks.

Applied Skills

1. Writing: Helping students express themselves in a cogent style.

2. Speaking: Encouraging students to speak clearly and forcefully in both individual and group situations.

3. Layout/Design: Organizing a report or project so the written elements and illustrations are pleasing to the eye.

Specialized Skills

1. Evaluation of Software: Discussing with students the advantages and disadvantages of using software to correct spelling errors.

2. Keyboarding: Encouraging students to utilize a personal computer in preparing and revising written work.

The Southern Regional Education Board has made teaching applied academics and higher level basic cognitive skills a priority. According to Bottoms and Korcheck (1989), the following should be instituted:

1. Require all vocational students to be competent in the proper use of calculators and computers to solve mathematical problems.

2. Science curriculum and instruction in grades 7 and 8 should include laboratory and hands-on experiences.

3. Vocational students should be required to complete science courses that incorporate laboratory experiences.

Study skills is another area of instruction recommended for improving schools. The rationale for teaching study skills is that once fully learned, a particular skill may be generalized and used in a variety of content areas (Alley and Deshler, 1979; Deshler and Schumaker, 1986). Sheinker and Sheinker (1982) emphasizes four major study skills or strategies useful in improving recall, understanding and generalization of materials learned:

Skimming - the ability to determine what is more important without becoming distracted with irrelevant data.

Summarizing - the ability to condense material read into a few key sentences that highlight the relationship between facts and concepts.

Notetaking - the ability to write notes about basic information in a meaningful sequence that shows the essential order of facts or events.

Outlining - requires mastery of skimming, summarizing and notetaking, and ability to organize information and concepts according to their relative value.

In Targeted Teaching Techniques (National Center for Research in Vocational Education, 1987a), educators were provided with assessment planning and management tools to improve students' basic skills. The individual components presented include five areas:

1. Technique for Management: Time for Learning laid foundations for more effective basic skills instruction through studying the use of classroom time.

2. Technique for Remediation: Peer Tutoring discussed the planning, implementation, and evaluation of peer tutoring programs to strengthen students' basic skills.

3. Technique for Computer Use: Software Evaluation described a procedure for joint evaluation of educational software for basic skills instruction.

4. Technique for Individualization: The Academic Development Plan provided guides to school staff through a systematic identification of individual student needs and steps to meet those needs.

5. Techniques for Joint Effort: The Vocational-Academic Approach described teaching techniques that vocational and academic teachers can use jointly to improve students' basic skills.

Sechler and Crowe (1987) made the following recommendations as a response by education to needed reform as a result of the workforce crisis:

1. Motivate students to study basic skills by providing application opportunities.

2. Encourage good study habits.

3. Recognize skills achievement.

4. Develop long-term informal relationships with employers.

5. Improve student records.

6. Collaborate with other teachers, counselors, and school specialists (p. D-4).

Learning

As put by the National Center for Research in Vocational Education (1987b), only a very small part of the population is incapable of learning basic skills. Research by Bloom and others concludes that students differ in their rate of learning rather than in their capacity to learn. Research has also shown that because teachers control teaching and students control the learning, each depends on the other (National Center for Research in Vocational Education, 1987b). Furthermore, strategies that work for one student may not work for another. Since each individual is different and possesses varied learning styles, teachers must utilize strategies that adapt to those learning styles.

Capacity to learn may often be understated. Sechler and Crowe (1987) emphasized that Bloom's studies revealed that:

1. under favorable conditions, up to 90 percent of the students can learn school subjects, presumably including basic skills, up to the same standard that the top 10 percent of the students accomplish under usual conditions.

2. perception of how well one is doing compared to peers influences self-esteem more than standardized achievement tests do.

3. under favorable conditions, most students become similar in learning ability, rate of learning, and motivation for further learning (p. F-3).

Integration of Academic and Vocational Education

There is national interest to integrate academic and vocational education (National Center on Research in Vocational Education, 1987b). Publications like Second to None: A Vision of the New California High School (California State Department of Education, 1992), organizations like the Center for Occupational Research and Development (CORD), and publications from the National Center for Research in Vocational Education (NCRVE) all attest to integration of academics and vocational education as a national thrust. The entire development of the TECH PREP concept emphasizes integration of academic and vocational study areas (CORD; 1992, January).

The National Center for Research in Vocational Education (1987b) expressed in The Bridger's Guide, Implementation Guide section, that the challenge can best be met by a joint effort of vocational and academic teachers. According to NCRVE, the thrust toward a joint vocational effort has the following underlying premises:

1. Academic basic skills are needed to perform vocational tasks. Both academic and vocational teachers are needed to identify how academic concepts are used in vocational courses.

2. Vocational tasks provide for realistic use of academic basic skills.

3. Neither academic basic skills nor vocational skills should be taught in isolation from each other.

4. Differences in students' learning style should be considered when determining teaching strategies to use in the classroom.

Business/Industry and Education Partnerships

Clark (1991, February/March) explained that the focus of many school/business partnerships in the 1980's was on field trips, career days, and classroom speakers. These student-oriented activities had little impact on producing fundamental changes in education.

Similarly, Thrust for Educational Leadership (Association of California School Administrators; 1991, February/March) cited Shaping Tomorrow's Workforce: A Leadership Agenda for the 90's as saying that historically, public and private workforce development programs have operated separately with different policies, structures, cultures and little interaction between them. This isolation should be replaced with closer cooperation.

The same source (Association of California School Administrators; 1991, February/March) quoted William Bennett, former U.S. Secretary of Education, as stating that American business men and women are taking increased interest in the important relationship between education and the economy. He is reported to have stated that in many cities across the country, partnerships are bringing new resources to our schools and a new commitment to students in our educational system. According to the magazine

Mr. Bennett indicated that these partnerships can be a vehicle for improving school performance, for building civic literacy, and for creating an effective workforce.

According to the Northwest Regional Educational Laboratory (1984, November), there is much going on to make the partnership between business and education a two-way street. According to this source, schools can provide services to business and industry by producing a more productive workforce, articulating with community colleges, providing instruction in schools and work sites, providing use of school facilities/resources, and providing management assistance. The Northwest Regional Educational Laboratory publication also recognized a unique project called the Oregon Partnership Education Program (OPEP). This organization was developed with the support of several electronics firms and Oregon State University in order to develop instructional modules using interactive computer/video technology.

A very unique partnership has developed between education and the Industry-Education Council (IEC) of California and its affiliates throughout that state. The IEC's joint efforts with education are directed at five distinct functions:

1. Cooperative planning
2. Curriculum revision
3. Staff development
4. Upgrading instructional materials (including donation of materials)
5. Improving school administration (Clark; 1991).

According to the Northwest Regional Educational Laboratory (1984, November), business and industry can and is doing many things

to support schools. These things include direct services to students, skill enrichment for teachers, contributions, and policy development. Direct service to students include:

1. visitations to trade shows
2. on-site use of equipment
3. tutors
4. job shadowing
5. loaned personnel
6. student work experience/cooperative education
7. hosting classes
8. field trips, tours, and visits
9. career days
10. tele/video communications
11. display/mobile units
12. sponsorship of events
13. youth organizations

Skill enrichment for teachers includes:

1. trade missions (representation)
2. teacher in-service classes
3. "open enrollment" in industry classes
4. donated equipment
5. financial support
6. awards for excellence
7. hidden support
8. materials and software

Support for policy development includes:

1. advisory committees

2. technical assistance

3. job market analysis

The California Educational Partnership Consortium; (1990, March) suggested a range of new partnership activities to assist educational restructuring in California. These included:

1. Encouraging business representatives to run for boards of education.

2. Teaching high efficiency/productivity/evaluation practices to school officials.

3. Fostering use of modern technology in school operations and curriculum.

4. Helping teach youth the relationship between school and jobs (p. 11).

Additionally the consortium outlined the following four ways that business and industry can help improve public education:

1. Serve as an advocate for education and education reform.

2. Enhance the teaching profession and strengthen administrative skills.

3. Promote parental involvement in education issues and their child's schooling.

4. Support school-site management and decision-making.

Partnerships between education and business are a win-win proposition. The following benefits should be considered:

Benefits to Business

1. Better understanding by young people of how the economy works and an appreciation for private enterprise.

2. A better educated workforce.

3. More stability in neighborhoods where corporations produce or sell.

4. Training in vocational education that more nearly matches what employers need.

5. Employee satisfaction from working for a company that does good things for the community.

6. Bottom line results in productivity and product quality resulting from education and training improvements.

Benefits to Schools

1. A broadened base of support for the educational system.
2. Greater recognition of schools and what they contribute to business and the economy.
3. Business people to come into the schools and help educated students about careers and job opportunities.
4. Use of partner's facilities and personnel for instruction.
5. Follow-through on school's and partner's commitment to the importance of experience in learning.
6. Financial resources, which are usually in short supply.
7. Access to state-of-the-art equipment.
8. Support for appropriate education legislation.
9. Help on management problems.
10. Access to job placements for graduates.
11. Graduates who have a better understanding of how the economy works (Oakes and Thomas; 1991, February/March; p. 13).

Niederhaus (1991, February/March) expressed that businesses want to be involved in educational partnerships in order to:

1. Increase employee morale

2. Provide public recognition of businesses who become school partners

3. Benefit from involvement in education.

Summary

This entire issue of preparing students for the workforce is summarized very well in a quote from Building a Quality Workforce found in the "Somebody Said" section of Thrust for Educational Leadership (Association of California School Administrators; 1991, February/March):

> In our changing economy, business needs to anticipate the changes better and articulate its workforce needs in ways that educators can understand and respond to. Business also needs to expand its involvement and investment in education in ways that produce measurable educational improvements. Education must seek business advice and guidance on the skills they need in their workplaces and then respond better to these needs.
>
> Educators need to find ways to translate these understandings into the content of the curriculum, the selection of personnel and the management of the educational enterprise--and ultimately into the standards attained by their students (p. 9).

CHAPTER III

METHODOLOGY

Design of the Study

This chapter explains the methodology used in gathering, analyzing, and interpreting the data gathered in this research project. The specific problem dealt with in this study is that new entrants into the workforce lack generic skills.

One purpose of this research was to compare the perceptions of first-level managers (FLMs), the person responsible for human resource development (PRFHRDs) and site-level chief executive officers (SLCEOs) within the business services industry of California concerning whether identified competencies are necessary for employee success in the business services industry on California. A second purpose of this research was to review evidence concerning the validity of the SCANS Report (U.S. Department of Labor; 1991, June) standards and competencies as applied to the business services industry area.

The research was designed to answer five questions:

1. What are the perceptions of site-level chief executive officers (SLCEOs) concerning each individual competency's or competency area's importance to employee success in the Business Services Industry (BSI)?

2. What are the perceptions of persons responsible for human resource development (PRFHRDs) concerning each individual competency's or competency area's importance to employee success in the BSI?

3. What are the perceptions of first-level managers (FLMs) concerning each individual competency's or competency area's importance to employee success in the BSI?

4. Do SLCEOs, PRFHRDs and FLMs share different perceptions concerning each individual competency's or competency area's importance to employee success?

5. What SCANS (U.S. Department of Labor; 1991, June) competencies are valid across occupations in the business services industry?

Hypothesis

A simple null hypothesis was used relative to question four that asserted that there is no statistically significant difference between the perceptions of SLCEOs, PRFHRDs and FLMs concerning each individual competency's importance to employee success.

<u>Statistical Hypotheses</u>:

$$H_0: \ m_{SLCEOs} = m_{FLMs} = m_{PRFHRDs}$$

<u>Decision Rule</u>:

Reject H_0 if $F_{oberved}$ is equal to or greater than $F_{critical}$ given an alpha of .05.

Population and Sample Selection

The research involved business services firms with at least 50 employees in the State of California. Firms of at least 50 employees were used in the study to ensure that survey returns from three levels of management were possible. Nine hundred fifty-three (953) business service firms were identified by using the 73 SIC codes in the 1991 California Services Register (Database Publishing Company, 1991).

According to Isaac and Michael (1982), the required random sample size should be ascertained by a table for determining needed size S of a randomly chosen sample from a given finite population of N cases such that the sample proportion p will be within + or -.05 of the population P with a 95 percent level of confidence. The sample size selected was 404 firms assuming a return rate of 65 percent. The 65 percent return rate satisfied Isaac and Michael's accepted sample size.

The random sample was identified by randomly drawing samples without replacement from a drum that was continually mixing individual businesses identified in the population. For expediency, sites, not individuals, were selected. The SLCEO from each firm selected was asked to complete a questionnaire and the PRFHRD and FLM to complete identical surveys. In the event that an individual assumed more than one of these roles, it was noted and the questionnaire was used to represent both roles checked.

The Research Instrument

The instrument was a survey-type questionnaire designed to determine perceptions regarding the importance of core competencies as they relate to success for entry-level positions and continuing employment within each firm. The survey used a Likert-type scale with a range of 1 - 5. Research input was treated as interval data for statistical purposes (Key, 1990).

The competencies listed on the survey instrument were derived from the competencies and foundations developed by SCANS (U.S. Department of Labor; 1991, June). A copy of the instrument can be found in Appendix C. This list of 36 competencies was utilized at the recommendation of the dissertation committee in order to add further research to a national study.

Pilot Test/Reliability Test

The pilot test was designed to sample thirty site-level chief executive officers from the business services firms that were not randomly selected as part of the research sample. A pre-test and post-test was administered under conditions comparable to those anticipated in the final study. Space was provided on the trial questionnaire for the respondents to give reactions and make suggested changes.

A post-test was given to each of these individuals after about four weeks to test for reliability using the Pearson correlation coefficient r. For the test of reliability, r^2 was to be used

because, according to Witte (1985), r^2 is more accurate and meaningful than r.

Data Collection

Data collection was by mail. The questionnaire was distributed to 404 randomly selected firms during the month of February, 1992. A follow-up letter was mailed to non-responding firms after 15 business days. The follow-up included additional copies of the instrument.

Follow-up of Nonrespondents

A follow-up on non-respondents was planned if the return rate did not exceed 65%. This return rate was required in order to generalize the results to the Business Services Industry in California. The purpose of the study of non-respondents was to compare this group with the study of respondents in order to allow generalization of data to the sampled population even though the return rate for the questionnaire was not adequate for generalization.

Single-Factor ANOVA Research Design

Analysis by single-factor ANOVA was used to answer research question 4. The specification data, model diagram, and source data for this single factor ANOVA research design are shown below:

Specification Data:

Variables	#Levels
Management Level	3
Subjects/Management Level	264
Total # Scores	792 for each survey item

Management Level = Independent Variable

Score on Likert Scale = Dependent Variable

Diagram

a_1	a_2	a_3
S=264	S=264	S=264

Source Data:

Source		df
Levels of Management		2
S/Levels of Management	(df = (3X264)	792
Total df	(df = (3X264-1)	791

Total number of scores - 1 = 792

H_0: $m_1 = m_2 = m_3$

alpha = .05

Additionally, this design assumed independence, normality, and homogeneity of variance. A random selection of the sample was used to facilitate independence. A frequency polygon was utilized to check normality.

Analysis of Data

Data gathered on a Likert-type scale were analyzed by comparing the pooled mean square (ANOVA) to determine whether perceptions of SLCEOs, PRFHRDs and FLMs differed significantly on each survey item.

In the analysis, the $F_{observed}$ for each comparison was evaluated against the critical values of F at 2 and 792. Since there are three levels of management, additional interpretation is required if the F-Ratio is significant (Williams, 1989). If the null hypothesis was rejected, the Newman-Keuls test was to be utilized for post-hoc analysis. The Newman Keuls test was utilized because according to Williams (1991), the Newman Keuls test makes multiple adjustments to the error depending on comparisons. It is a test for all possible pairs.

If the F-Ratio was significant, the strength of the management level effect was evaluated using eta squared (r^2). r^2 is the most common index of strength in multiple-regression and correlation (Keppel, 1982).

CHAPTER IV

PRESENTATION OF THE FINDINGS

The purpose of this research was to compare the perceptions of first-level managers (FLMs), the person responsible for human resource development (PRFHRDs) and site-level chief executive officers (SLCEOs) within the business services area of California concerning whether identified competencies are necessary for employee success in their firms. A second purpose of this research was to review evidence concerning the validity of the SCANS Report (U.S. Department of Labor; 1991, June) foundations and competencies as applied to the Business Services Industry Area. The intent of the research was to generalize the findings to the business services industry in California. In order to do this, a desired sample of 264 businesses was necessary with three levels of management returning questionnaires at each site. This return rate was not attained.

Analysis of the data is presented in four sections. The first describes the comparison of the main study and a study of non-respondents using one of two T-Tests to measure variances depending on the results of the test for homogeneity of variance. The second section deals with determining competencies that are transferable across occupations within the business services area. The third section describes the results of the two-way analysis of variance for each of the 36 competencies on the survey instrument. This

section deals with the findings for the hypothesis. The fourth outlines the demographic analysis of the respondents.

Data Collection Procedure

Sample

The sample for the study was selected from three levels of management: FLMs, PRFHRDs, and SLCEOs. The sample selection process involved randomly identifying 404 businesses from the Business Services Area in California and asking that each site-level CEO select one manager from each of the other two levels of management to complete the survey.

Procedures

The initial survey was mailed to the identified site-level CEO at the 404 firms selected for the survey. The initial correspondence included a cover letter and three surveys, one of which was to be completed by the SLCEO. The SLCEO was asked to select a FLM and PRFHRD to complete the other two surveys. Approximately four weeks later a follow-up message was sent using a fax machine reminding CEOs to return their surveys.

Return Rate

Seventy firms returned surveys for one or more levels of management. Nineteen surveys were returned marked "no such address." A follow-up fax message was used to encourage sampled

businesses to send responses. The overall return rate was 18.4%.

Follow-Up of Non-Respondents

Since the response rate was not adequate to generalize to the population, a follow-up survey of the non-respondents to the initial survey was done in order to determine whether there was evidence that non-respondents and respondents to the main study were responding in a similar fashion. This survey included a cover letter and a copy of the questionnaire. Forty-three (35.8%) businesses returned one survey for at least one of the levels of management.

Statistical analysis of these data, utilizing a T-test (See Appendix D), indicated that the two samples (respondents and non-respondents) were significantly different at the .05 level on 2 of the 36 competencies. These were the competencies: Use computers to process information and Select Technology - choose procedures, tools or equipment, including computers and related technology.

Based on the similarity of data for the original respondent group and the non-respondent group, all data was collapsed for purposes of analysis. The number of firms responding by one or more levels of management for the collapsed data represents 29.4% of the firms surveyed.

Analysis of Data

Part of the research design was to rank the competencies by mean rating for each level of management for the combined sample.

Competencies which received a mean rating of 3.75 or higher using the sum of the respondent groups were accepted as generic and transferable across occupations in the Business Services Area. This criterion was used since it provides evidence that a majority of the respondents perceived the competency as important.

Table I contains the data to answer the research question: What are the perceptions of site-level chief executive officers (SLCEOs) concerning each individual competency's importance to employee success in the Business Services Industry Area (BSIA)? Data from a Likert Scale was used to rate the importance of each competency. Twenty-six of the 36 competencies received a mean rating of 3.75 or higher.

Table II contains the data to answer the question: What are the perceptions of persons responsible for human resource development (PRFHRDs) concerning each individual competency's importance to employee success in the BSIA? Data from a Likert Scale was used to rate the importance of each competency. Twenty-five of the 36 competencies received a mean rating of 3.75 or higher.

Table III contains the data to answer the question: What are the perceptions of first-level managers (FLMs) concerning each individual competency's importance to employee success in the BSI? This, too, was answered by utilizing a Likert Scale to rate the importance of each competency. Twenty-six of the 36 competencies received a mean rating of 3.75 or higher.

Table IV contains the data to answer the research question: What SCANS (U.S. Department of Labor; 1991, June) competencies are

TABLE I

RANK AND MEAN OF SCANS COMPETENCIES
AND STANDARDS BY CEOS

Rank	Survey Item Number	Competency	Mean
1	36	Be honest & maintain integrity	4.80952
2	7	Serve clients/customers	4.71429
3	24	Listen	4.67857
4	32	Be responsible	4.60714
5	5	Participate as member of team	4.42857
6	1	Manage time	4.38095
7	33	Maintain self-esteem	4.38095
8	25	Speak	4.32143
9	13	Interpret & communicate information	4.30952
10	22	Write	4.30952
11	35	Exercise self-management	4.30952
12	28	Solve problems	4.26190
13	27	Make decisions	4.22619
14	30	Know how to learn	4.14286
15	11	Acquire & evaluate information	4.11905
16	26	Think creatively	4.11905
17	21	Read	4.05952
18	12	Organize & maintain information	4.04762
19	34	Socialize	4.02381
20	8	Exercise leadership	3.97619
21	10	Work with diversity	3.97619
22	4	Manage human resources	3.91667
23	14	Use computer to process information	3.91667
24	31	Reason	3.91667
25	23	Do math	3.80952
26	6	Teach others new skills	3.78571
27	9	Negotiate	3.66667
28	29	See things in the mind's eye	3.65476
29	15	Understand systems	3.57143
30	16	Monitor & correct performance	3.55952
31	2	Manage money	3.51190
32	19	Apply technolgy task	3.30952
33	17	Improve & design system	3.25000
34	3	Manage materials & facilities	3.08333
35	18	Select technology	2.91667
36	20	Maintain & troubleshoot equipment	2.72619

TABLE II

RANK AND MEAN OF SCANS COMPETENCIES AND FOUNDATION BY PERSONS RESPONSIBLE FOR HUMAN RESOURCE DEVELOPMENT (PRFHRDS)

Rank	Survey Item Number	Competency	Mean
1	36	Be honest and maintain integrityt	4.80303
2	7	Serve clients/customers	4.71212
3	24	Listen	4.66667
4	5	Participate as a member of a team	4.65152
5	32	Be responsible	4.65152
6	33	Maintain self-esteem	4.42424
7	1	Manage time	4.40909
8	25	Speak	4.40909
9	28	Solve problems	4.36364
10	35	Exercise self-management	4.31818
11	13	Interpret & communicate information	4.28788
12	10	Work with diversity	4.25758
13	22	Write	4.24242
14	27	Make decisions	4.24242
15	12	Organize & maintain information	4.15152
16	11	Acquire & evaluate information	4.12121
17	30	Know how to learn	4.09091
18	21	Read	4.07576
19	26	Think creatively	4.07576
20	34	Socialize	4.07576
21	14	Use computer to process information	4.06061
22	8	Exercise leadership	4.00000
23	4	Manage human resources	3.95455
24	9	Negotiate	3.78788
25	31	Reason	3.78788
26	6	Teach others new skills	3.69697
27	23	Do math	3.62121
28	15	Understand systems	3.54545
29	2	Manage money	3.53030
30	16	Monitor & correct performance	3.43939
31	19	Apply technology to task	3.31818
32	29	See things in the mind's eye	3.30303
33	17	Improve & design systems	3.28788
34	3	Manage materials & facilities	3.24242
35	18	Select technology	3.00000
36	20	Maintain & troubleshoot equipment	2.89394

TABLE III

RANK AND MEAN OF SCANS COMPETENCIES AND FOUNDATION BY FIRST-LEVEL MANAGERS (FLMS)

Rank	Survey Item Number	Competency	Mean
1	36	Be honest & maintain integrity	4.85714
2	7	Serve clients/customers	4.77922
3	5	Participate as a member of a team	4.68831
4	32	Be responsible	4.68831
5	24	Listen	4.57143
6	28	Solve problems	4.44156
7	33	Maintain self-esteem	4.44156
8	35	Exercise self-management	4.42857
9	1	Manage time	4.41558
10	25	Speak	4.36364
11	13	Interpret & communicate information	4.35065
12	22	Write	4.32468
13	27	Make decisions	4.32468
14	10	Work with diversity	4.27273
15	11	Acquire & evaluate information	4.27273
16	12	Organize & maintain information	4.27273
17	21	Read	4.20779
18	26	Think creatively	4.15584
19	30	Know how to learn	4.14286
20	34	Socialize	4.11688
21	14	Use computers to process information	4.09091
22	31	Reason	4.01299
23	8	Exercise leadership	3.94805
24	23	Do math	3.93506
25	9	Negotiate	3.83117
26	6	Teach others new skills	3.79221
27	4	Manage human resources	3.72727
28	29	See things in the mind's eye	3.59740
29	15	Understand systems	3.58442
30	19	Apply technology to task	3.54545
31	2	Manage money	3.50649
32	17	Improve & design systems	3.42857
33	16	Monitor & correct performance	3.36364
34	3	Manage materials & facilities	3.23377
35	18	Select technology	3.09091
36	20	Maintain & troubleshoot equipment	3.02597

TABLE IV

GENERIC SKILLS DETERMINED BASED ON OVERALL RANK AND MEAN OF SCANS COMPETENCIES AND STANDARDS FOR ALL RESPONDENTS

Rank	Survey Item Number	Competency	Mean	Generic Skill
1	36	Be honest & maintain integrity	4.82379	yes
2	7	Serve clients/customers	4.73568	yes
3	32	Be resposible	4.64758	yes
4	24	Listen	4.63877	yes
5	5	Participate as a member of a team	4.58150	yes
6	33	Maintain self-esteem	4.41410	yes
7	1	Manage time	4.40088	yes
8	25	Speak	4.36123	yes
9	28	Solve problems	4.35242	yes
10	35	Exercise self-management	4.35242	yes
11	13	Interpret & communicate information	4.31718	yes
12	22	Write	4.29515	yes
13	27	Make decisions	4.26432	yes
14	11	Acquire & evaluate information	4.17181	yes
15	10	Workign with diversity	4.15859	yes
16	12	Organize & maintain information	4.15419	yes
17	30	Know how to learn	4.12775	yes
18	26	Think creatively	4.11894	yes
19	21	Read	4.11454	yes
20	34	Socialize	4.07048	yes
21	14	Use computers to process information	4.01762	yes
22	8	Exercise leadership	3.97357	yes
23	31	Reason	3.91189	yes
24	4	Manage human resources	3.86344	yes
25	23	Do math	3.79736	yes
26	6	Teach others new skills	3.76211	yes
27	9	Negotiate	3.75771	yes
28	15	Understand systems	3.56828	no
29	29	See things in the mind's eye	3.53304	no
30	2	Manage money	3.51542	no
31	16	Monitor & correct performance	3.45815	no
32	19	Apply technology to tasks	3.39207	no
33	17	Improve & design systems	3.32159	no
34	3	Manage materials & facilities	3.18062	no
35	18	Select technology	3.00000	no
36	20	Maintain & troubleshoot equipment	2.87655	no

important across occupations in the business services area as judged by SLCEOs, PRFHRDs, and FLMs in a comined rating. This was determined by calculating the overall mean ratings for each of the 36 competencies, all of which were from the SCANS study. Those having a mean rating of 3.75 or greater were considered valid and generic across occupations. Twenty-seven of the 36 competencies received a mean rating of 3.75 or higher.

Twenty-seven of the thirty-six survey items derived from SCANS competencies and standards were accepted as valid across occupations in the Business Services Industry Area. These include by item number on the survey instrument:

Resources

1 Manage Time -- Select goal-relevant activities, rank them, allocate time, and prepare and follow schedules

4 Manage Human Resources -- Assess skills and distribute work (valid) accordingly, evaluate performance and provide feedback

Interpersonal

5 Participate as Member of a Team -- Contribute to group effort

6 Teach Others New Skills

7 Serve Clients/Customers -- Work to retain satisfy customers' expectations

8 Exercise Leadership -- Communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies

9 Negotiate -- Work toward agreements involving exchange of resources, resolve divergent interests

10 Work with Diversity -- Work well with men and women from diverse backgrounds

Information

11 Acquire and Evaluate Information

12 Organize and Maintain Information

13 Interpret and Communicate Information

14 Use Computers to Process Information

Systems

None observed

Basic Skills

21 Read -- Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules

22 Write -- Communicate thoughts, ideas, information, and messages in writing; and create documents such as letters, directions, manuals, reports, graphs, and flow charts

23 Do Math -- Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques

24 Listen -- Receive, attend to, interpret, and respond to verbal messages and other cues

25 Speak -- Organize ideas and communicate orally

Thinking Skills

26 Think Creatively -- Generate new ideas

27 Make Decisions -- Specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative

28 Solve Problems -- Recognize problems and devise and implement a plan of action

29 See Things in the Mind's Eye -- Organize, and process symbols, pictures, graphs, objects, and other information

30 Know How to Learn -- Use efficient learning techniques to acquire and apply new knowledge and skills

31 Reason -- Discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem

Personal Qualities

32 Be Responsible -- Exert a high level of effort and perseveres toward goal attainment

33 Maintain Self-Esteem -- Believe in own self-worth and maintain a positive view of self

34 Socialize -- Demonstrate understanding, friendliness and adaptability, empathy, and politeness in group settings

35 Exercise Self-Management -- Assess self accurately, set personal goals, monitor progress, and exhibit self-control

36 Be Honest and Maintain Integrity -- Choose ethical courses of action

The nine survey items derived from SCANS competencies and standards that were not accepted as valid across occupations in the

business services industry are listed by area and item number on the survey. They include:

Resources

2 Manage Money -- Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives

3 Manage Material and Facilities -- Acquire, store, allocate and use materials

Interpersonal

All accepted

Information

All accepted

Systems

15 Understand Systems -- Know how social, organizational, and technological systems work and operate effectively with them

16 Monitor and Correct Performance -- Distinguish trends, predict impacts on system operations, diagnose deviations in systems performance and correct malfunctions

17 Improve or Design Systems -- suggest modifications to existing systems and develop new or alternative systems to improve performance

18 Select Technology -- Choose procedures, tools or equipment including computers and related technology

19 Apply Technology to Task -- Understand overall intent and proper procedures for setup and operation of equipment

20 Maintain and Troubleshoot Equipment -- Prevent, identify, or solve problems with equipment, including computers and other technologies

29 See Things in the Mind's Eye -- Organize, and process symbols, pictures, graphs, objects, and other information

Test of Hypothesis

The null hypothesis for this design asserted that there is no statistically significant difference between the perceptions of SLCEOs, PRFHRDs and FLMs concerning each individual competency's importance to employee success.

Statistical Hypotheses

$$H_0: \ m_{SLCEOs} = m_{FLMs} = m_{PRFHRDs}$$

Decision Rule

Reject H_0 if $F_{oberved}$ is equal to or greater than $F_{critical}$ given an alpha of .05.

The questionnaire in this research obtained perceptions of three levels of management as to the importance of the 36 identified competencies to employee success in their business. A 5 point Likert type scale was used to obtain importance ratings. The descriptions were: 1 = definitely not important, 2 = probably not important, 3 = could be important, 4 = important, and 5 = very important.

To test the hypothesis, analysis of variance (ANOVA) was used to compare means of competencies as determined by the Likert Scale rating completed by each level of management. ANOVA calculates the variances of each subgroup being compared. The mean variance of these subgroups is compared to the variance of an artificial combining of the subgroups. When the average variance of the subgroups is about equal to the variance of the total group, the evidence supports a claim of no significant difference among the means of the subgroups. If the mean variance of the subgroups is smaller than the variance of the total group, there is evidence that the subgroups are significantly different (Key, 1990).

A total of 36 F tests were computed, one for each of the 36 competencies identified. Of these, only one indicated a difference at the .05 level of significance. This competency dealt with the interpersonal competency: Participates as a member of a team -- contributes to group effort. While there was a significant difference for this item, each of the groups rated this competency as one of their top five competencies.

A summary of the results of the single-factor ANOVA for the 36 competencies derived from SCANS research are found in Table V. In this table, the decision to retain or reject the null hypothesis is noted and the mean scores are listed and labeled as to whether or not evidence suggests that each competency is important across occupations in the business services industry area.

Since a significant difference was found between levels of management on a competency, the data was submitted to the

TABLE V

RESULTS OF THE SINGLE FACTOR ANOVA FOR MANAGEMENT LEVELS: HYPOTHESIS -- THERE IS NO SIGNIFICANT DIFFERENCE IN THE PERCEPTIONS BY LEVELS OF MANAGEMENT

Item Number	Competency	Mean	F	Pr>F	Decision
Resources:					
1	Manage Time--Select goal-relevant activities, rank them, allocate time, and prepare and follow schedules	4.0088 (valid)	0.05	.9481	retain
2	Manage Money--Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives	3.5154	0.01	.9901	retain
3	Manage Material and Facilities--Acquire, store, allocate and use materials	3.1806	0.59	.5555	retain
4	Manage Human Resources--Assess skills and distribute work accordingly, evaluate performance and provide feedback	3.8634 (valid)	1.11	.3301	retain
Interpersonal:					
5	Participates as Member of a Team --Contributes to group effort	4.5815 (valid)	3.77	.0245	reject*
6	Teach Others New Skills	3.7621	0.25	.7823	retain
7	Serve Clients/Customers--Work to satisfy customers' expectations	4.7357 (valid)	0.31	.7339	retain
8	Exercise Leadership--Communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies	3.9736 (valid)	0.07	.9336	retain

TABLE V (Continued)

Item Number	Competency	Mean	F	Pr>F	Decision
9	Negotiate--Work toward agreements involving exchange of resources, resolve divergent interests	3.7577 (valid)	0.61	.5432	retain
10	Work with Diversity--Work well with men and women from diverse backgrounds	4.1586 (valid)	2.65	.0729	retain
Information:					
11	Acquire and Evaluate Information	4.1718	1.15	.3170	retain
12	Organize and Maintain Information	4.1542	1.94	.1461	retain
13	Interpret and Communicate Information	4.3172 (valid)	0.18	.8370	retain
14	Use Computers to Process Information	4.0176 (valid)	0.82	.4426	retain
Systems:					
15	Understand Systems--Know how social, organizational, and technological systems work and operate effectively with them	3.5683	0.03	.9658	retain
16	Monitor and Correct Performance--Distinguish trends, predict impacts on system operations, diagnose deviations in systems performance and correct malfunctions	3.4581	0.77	.4639	retain
17	Improve or Design Systems--suggest modifications to existing systems and develop new or alternative systems to improve performance	3.3216	0.73	.4820	retain

TABLE V (Continued)

Item Number	Competency	Mean	F	Pr>F	Decision
Technology:					
18	Select Technology--Choose procedures, tools or equipment including computers and related technology	3.0000	0.49	.6154	retain
19	Apply Technology to Task--Understand overall intent and proper procedures for setup and operation of equipment	3.3921	1.19	.3076	retain
20	Maintain and Troubleshoot Equipment--Prevent, identify, or solve problems with equipment, including computers and other technologies	2.8767	1.52	.2220	retain
Basic Skills:					
21	Read--Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules	4.1145 (valid)	0.51	.6033	retain
22	Write--Communicate thoughts, ideas, information, and messages in writing; and create documents such as letters, directions, manuals, reports, graphs, and flow charts	4.2952 (valid)	0.20	.8177	retain
23	Do Math--Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques	3.7974 (valid)	1.98	.1405	retain
24	Listen--Receive, attend to, interpret, and respond to verbal messages and other cues	4.6388 (valid)	0.67	.5152	retain
25	Speak--Organize ideas and communicate orally	4.3612 (valid)	0.27	.7601	retain

TABLE V (Continued)

Item Number	Competency	Mean	F	Pr>F	Decision
Thinking Skills:					
26	Think Creatively--Generate new ideas	4.1189 (valid)	0.23	.7956	retain
27	Make Decisions--Specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative	4.2643 (valid)	0.44	.6476	retain
28	Solve Problems--Recognize problems and devise and implement a plan of action	4.3524 (valid)	1.09	.3382	retain
29	See Things in the Mind's Eye--Organize, and process symbols, pictures, graphs, objects, and other information	4.1276 (valid)	0.10	.9059	retain
30	Know How to Learn--Use efficient learning techniques to acquire and apply new knowledge and skills	4.1278 (valid)	0.10	.9059	retain
31	Reason--Discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem	3.9119 (valid)	1.53	.2678	retain
Personal Qualities:					
32	Be Responsible--Exert a high level of effort and perseveres toward goal attainment	4.6476 (valid)	0.50	.6068	retain
33	Maintain Self-Esteem--Believe in own self-worth and maintain a positive view of self	4.4141 (valid)	0.15	.8581	retain
34	Socialize--Demonstrate understanding, friendliness and adaptability, empathy, and politeness in group settings	4.0705 (valid)	0.27	.7623	retain
35	Exercise Self-Management--Assess self accurately, set personal goals, monitor progress, and exhibit self-control	4.3524 (valid)	0.75	.4729	retain
36	Be Honest and Maintain Integrity --Choose ethical courses of action	4.8239 (valid)	0.38	.6853	retain

Newman-Keuls test makes multiple adjustments to the error depending on comparisons. It is a test for all possible pairs. When the F-Ratio was significant, the strength of the management level effect was evaluated using eta squared (r^2).

The Newman-Keuls test on the competency: Participates as a member of a team - contributes to group effort, indicated that the perception of SLCEOs concerning the importance of the competency differed from the perceptions of the other two levels of management. Again, it is important to note that each of these groups of respondents rated this competency in the top five. Table VI shows the results of the Newman-Keuls post hoc test on the competency: "Participates as a member of a team (contributes to group effort)." The null hypothesis was accepted for 35 of the 36 competencies.

Demographic Data

Demographic data was collected by adding a section to the survey that requested age category, management level, business category, number of employees at the site, gender, and education level.

Table VII and VIII show the percentage of respondents by level of management and identified age categories respectively.

Table IX lists the percentage of respondents by business category. Business category was determined from data listed in the 1991 California Services Register (Database Publishing Company, 1991).

TABLE VI

NEUMAN-KEULS TEST FOR THE COMPETENCY --
PARTICIPATES A MEMBER OF A TEAM

SNK GROUPING	MEAN	N	MANAGEMENT LEVEL
A	4.6883	77	FLM
A	4.6515	66	PRFHRD
B	4.4286	84	SLCEO

Means with the same letter are not significantly different at the .05 level.

TABLE VII

RESPONDENT PERCENTAGES BY LEVEL OF MANAGEMENT

Management Level	Absolute Frequency	Frequency (%)	Cumulative Frequency (%)
FLM	77	33.92	33.92
PRFHRD	66	29.07	62.99
SLCEO	84	37.01	100.00
Total	227	100.00	

TABLE VIII

RESPONDENT PERCENTAGES BY AGE

Age	Absolute Frequency	Frequency (%)	Cumulative Frequency (%)
under 40	92	40.53	40.53
40-49	66	29.52	70.05
50 and over	69	29.95	100.00
Total	227	100.00	

TABLE IX

RESPONDENT PERCENTAGES BY BUSINESS CATEGORY

Management level	Absolute Frequency	Frequency (%)	Cumulative Frequency (%)
Computer Tech.	83	36.56	36.56
Other	66	29.07	65.63
Advertising	22	9.69	75.32
ETTMS*	56	24.68	100.00
Total	227	100.00	

*Employment training, temporary employment, maintenance, and security.

Table X and XI respectively list the percentage of respondents by number of employees at a site and percentage of respondents by sex. The number of employees by site was determined by each company's listing in the 1991 California Services Register (Database Publishing Company, 1991) and gender was determined by data from the survey instrument.

Table XII lists the percentage of respondents by highest education level attained. It is interesting to note that 2/3 of the respondents had completed a baccalaureate or higher degree.

When subjecting the two groups of data to Chi-square (See Appendix E), there was no evidence of a difference based on demographics at the .05 significance level. It is noted, however, that Chi-square may not be a valid test on the factors of Age, Organization Size, and Education Level since too great a percentage of the cells had expected counts of less than 5 (Key, 1990).

Table XIII show the rejected competencies by level of management and for the collapsed sample. The mean rating of each competency is listed if it was accepted for a given sample category of management level.

Discussion of Findings

It was interesting to note that an argument can be made for adjusting the mean rating used to determine whether a competency is important. For example, if the minimum mean rating used to determine whether a competency is important is adjusted to 4.0 rather than 3.75; the effect would be to reject 15 competencies

instead of nine. On the other hand, if the minimum mean rating used to determine whether a competency is important is changed to 3.5, the result would be to reject six competencies as opposed to nine (See Table V).

TABLE X

RESPONDENT PERCENTAGES BY NUMBER OF EMPLOYEES AT SITE

Number Employees at site	Absolute Frequency	Frequency (%)	Cumulative Frequency (%)
50- 99	110	48.56	48.56
100- 99	46	20.26	68.82
200-299	32	14.10	82.92
Over 300	39	17.08	100.00
Total	227	100.00	

TABLE XI

GENDER OF RESPONDENTS BY FREQUENCY AND PERCENTAGE

Sex	Absolute Frequency	Frequency (%)	Cumulative Frequency (%)
Male	131	57.71	57.71
Female	66	42.29	100.00
Total	227	100.00	

TABLE XII

EDUCATION LEVEL OF RESPONDENTS
BY FREQUENCY AND PERCENTAGE

Education Level Completed	Absolute Frequency	Adjusted Frequency (%)	Cumulative Frequency (%)
Elementary	2	.88	.88
High School	39	17.18	18.06
Associate Arts	36	15.86	33.92
Bachelors	104	45.81	79.73
Masters	42	18.50	98.20
Doctorate	4	1.76	100.00
Total	227	100.00	

TABLE XIII

REJECTED COMPETENCIES BY LEVEL OF MANAGEMENT
AND FOR THE COLLAPSED SAMPLE

Competency Rejected by FLMs		All Levels	SLCEOs	PRFHRDs	
2.	Manage Money	X	X	X	X
3.	Manage Material and Facilities	X	X	X	X
4.	Manage Human Resources	3.95	3.95	X	3.86
6.	Teach Others New Skills	3.79	X	3.79	3.76
9.	Negotiate	X	3.79	3.83	3.76
15.	Understand Systems	X	X	X	X
16.	Monitor and Correct Performance	X	X	X	X
17.	Improve or Design Systems	X	X	X	X
18.	Select Technology	X	X	X	X
19.	Apply Technology to Task	X	X	X	X
20.	Maintain and Troubleshoot Equipment	X	X	X	X
23.	Do Math	3.92	X	3.94	3.91
29.	See Things in the Mind's Eye	X	X	X	X

Mean scores of non-rejected competencies are listed in order to show consistency in ratings between levels of management. Ratings are based on a 1 - 5 scale. Mean ratings of 3.75 or less were rejected.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this research was to compare the perceptions of first-level managers (FLMs), the person responsible for human resource development (PRFHRDs) and site-level chief executive officers within the Business Services Industry Area of California concerning whether identified competencies are necessary for employee success in their firms. A second purpose of this research was to review evidence concerning the importance of the SCANS Report (U.S. Department of Labor; 1991, June) foundations and competencies as applied to Business Services Industry Area occupations.

The instrument used to collect data was a survey-type questionnaire designed to determine perceptions regarding the importance of competencies as they relate to success for entry-level positions and continuing employment within each firm. From the list of competencies, the survey was used to determine which competencies were generic. The survey used a Likert-type scale with a range of 1-5. A copy of the instrument can be found in Appendix B.

The survey instrument was also designed to test the competencies and foundations as presented in the SCANS Report (U.S. Department of Labor; 1991, June). Using SCANS competencies and

foundation, 36 survey items were derived and tested by the research instrument.

The research involved California business services firms with at least 50 employees. Nine hundred fifty-three (953) business services firms were identified by using the 73 SIC code in the 1991 California Services Register (Database Publishing Company, 1991).

Data gathered was analyzed by comparing the pooled mean square (ANOVA) to determine whether perceptions of SLCEOs, PRFHRDs and FLMs differed significantly on each survey item. The $F_{observed}$ for each comparison was evaluated against the critical values of F. Additional interpretation was required if the F-Ratio was significant (Williams, 1989). When the null hypothesis was rejected, the Newman-Keuls test was utilized for post-hoc analysis.

Since the return rate for the survey was inadequate to generalize to the sampled population, a study of non-respondents was conducted. Chi square analysis indicated that there was no significant evidence that perceptions were different as a result of age of respondents, type business, business size, sex, or education level attained. Furthermore, a simple T-test indicated that there was no evidence of significant differences in the perceptions between the respondent sample and non-respondent sample on 34 of the 36 competencies on the survey.

The return rate for the study of non-respondents was inadequate to allow for a generalization to the sampled population. The two samples were combined for further analysis. Using the combined samples, the mean rating of competencies by management level were

ranked, the mean cumulative rating was ranked and the F statistic at the .05 significance level was used to compare means of competencies.

Findings

The analysis of data for this study is the basis for the following findings:

1. The review of literature indicated that the ability of schools to prepare students adequately for their future role in the workplace is a national concern.

2. The results of the study cannot be generalized to the business services sector in California.

3. Site-level chief executive officers rated 26 survey items with a mean 3.75 or higher which was the criteria for declaring a competency valid in this study.

4. Persons responsible for human resource development rated 27 survey items with a mean 3.75 or higher which was the criteria for declaring a competency valid in this study.

5. First-level managers rated 26 survey items with a mean 3.75 or higher which was the criteria for declaring a competency valid in this study.

6. The 27 competencies and standards that were accepted as common across occupations in the business services area by two or more levels of management are ranked in the following order: honesty and integrity, customer service, responsibility, listening, team player, self-esteem, time management, speaking ability, problem

solving, self-management, general communication skills, writing, decision-making, evaluation, work with different people, organization information, know how to learn, creativity, reading, ability to socialize, use computers for information processing, exercise leadership, reason, manage human resources, do math, teach others, and negotiate.

7. Although *participates as a Member of a Team* was rated as important (3.75 or greater) by all three levels of management, there was a significant difference at the .05 level between the rating given this competency by site-level CEOs as opposed to the other two levels of management. CEOs rated this competency lower than the other two levels of management.

8. There was no significant evidence that SLCEOs, PRFHRDs and FLMs share a different perception of each individual competency's importance to employee success for 35 of the 36 competencies. In fact, the nine competencies which were rejected as generic in this study were unanimously rejected by all three levels of management.

9. The nine competencies which were rejected as generic by the three levels of management collectively (mean rating of less than 3.75) are ranked in the following order of importance to success in the workplace: understand systems, see things in the mind's eye, manage money, monitor and correct performance, apply technology to task, improve or design systems, manage materials and facilities, select technology, and maintain and troubleshoot equipment.

10. SCANS competencies and foundation consist of seven major areas from which the competencies used in this researched were

derived. Based on the perceptions as determined by the surveys completed by all respondents collectively, derived competencies from the following areas were unanimously perceived as important across occupations in this study: inter-personal, information, basic skills, thinking skills, and personal qualities (Appendix C).

11. Based on the results of the collective surveys returned by all respondents, the only major area that resulted in a unanimous rejection of derived competencies was technology.

Conclusions

Based on the results of this research, the following conclusions are made:

1. Because of the strong perception that personal qualities and interpersonal skills are important to success on the job in the business services area, schools could better prepare students entering occupations in this area by including activities that emphasize the development of inter-personal relationship skills, information processing skills, basic skills, thinking skills, and appropriate personal qualities (attitudes or dispositions).

2. The reason for the rejection of competencies in this study while they were accepted by SCANS research is unclear. Three major factors may explain this difference. Firstly, SCANS research may have been heavily influenced by the manufacturing industry which is likely to have put much greater importance on technology area competencies like *troubleshooting technology*. Secondly, it is also possible that a different interpretation of certain competencies may

have resulted in a significant difference in the perceptions as rated in this study. Finally, SCANS research focused on the future workplace, while this study dealt with current perceptions of the importance of SCANS derived competencies.

3. The review of literature clearly indicates that our country's future rests on preparing an adequate workforce. Furthermore, conversations with numerous business services area management personnel support business and industry's concern about how schools are preparing youth for the workplace. Therefore, it is important for schools to consider preparation for work when determining the purpose of schooling. The data gathered in this research supports the concept that the traditional basics along with various SCANS competencies and foundation are important to success in the business services area workplace.

Recommendations

Based on the results of this research, the following recommendations are made:

Further Study

1. Additional research is needed to determine what workplace basic skills and dispositions are important for individuals to acquire for success across occupations.

2. This study should be replicated with certain modifications in order to determine workplace basic skills that are common across different occupations in the workplace. While the basic design of

this study should be used, it should be modified to make competencies on the survey more clear. Since the levels of management sampled in this study did not indicate a significant difference in perceptions on 35 of the 36 competencies, it is recommended that future management samples be gathered without an absolute need to measure errors as a result of the level of management variable. This should result in a greater questionnaire return rate.

3. Since preparing students to work with new technologies received a lot of attention in school restructuring efforts, further study should address why the *technology* area competencies were rated lowest by the sampled population. Furthermore, a clarification should be made of the definition of both *technology* and *understand systems*. SCANS descriptors should be checked to see if the terminology results in the appropriate perceptions by readers.

Practice

1. In order to maintain and improve the economy of the United States, schools should focus on their role as providers of basic skills which prepare students for work. Consideration should be given to include those workplace basic skills that were identified as important in this study.

2. Generic skills should be determined across the majority of occupations, and for occupational areas or clusters of occupations that can be identified by students when they are establishing their career goals.

3. Generic workplace basic skills should be a primary basis for determining the basic skills curriculum for both students in general and students who establish career goals.

4. Because of the strong perception that personal qualities and interpersonal skills are important to success on the job in the business services area, a emphasis should be placed on developing the personal qualities and interpersonal relationship skills of youth who are preparing for business services area careers.

BIBLIOGRAPHY

Adler, Mortimer J. (1982). The Paideia Proposal: An Educational Manifesto. New York, NY: Macmillan Publishing Company.

Akyeampong, Ataa Asamoah. (1986, April 29). A Methodology for the Assessment of Management Development Needs in Industry. (Unpub. Ph.D. dissertation, Oregon State University.)

Alley, G., & Deshler, D. (1979). The Helping Relationship and Socialization of Children: Some Perspectives on Tutoring. In V. L. Allen (Ed.), Children as Teachers: Theory and Research on Tutoring. New York, NY: Academic.

Ascher, Gordon, and Black, Janet. (1986, May). Incorporating the Academic Reform Movement Into Vocational Education: A position and Recommenda-tion for Action. Paper Presented to the NASDVE/ NVEPDC Spring Conference. Washington, DC: NASDVE.

Association of California School Administrators. (1991, February/ March). School to Work: Making the Connection. Thrust for Educational Leadership, Vol. 20, No. 5, p. 9.

Association of California School Administrators. (1991, November 25). EDCAL. Volume 21, Number 17. The official newspaper of the Association of California School Administrators. Using SCANS, L.A. to Guarantee Graduates' Skills, pp. 1 and 6.

Bailey, Thomas. (1990, May). Changes in the Nature and Structure of Work: Implications for Skill Requirements and Skill Formation. Berkeley, CA: National Center for Research in Vocational Education.

Bailey, Thomas. (1990, Spring). Jobs of the Future and the Skills They Will Require. American Educator, Vol. 14, No. 1, pp. 10-15, 40-44.

Benjamin, Steve. (1989, September). An Ideascape for Education: What Futurists Recommend. Educational Leadership, Vol. 7, pp. 8-14.

Bottoms, Gene, and Korcheck, Stephanie A. (1989). Assessing the Reading, Mathematics, and Science Achievement of 1988 Secondary Vocational Completers: 1988 Baseline Assessment. Atlanta, GA: Southern Regional Education Board.

Boyer, Ernest L. (1983). High School, a Report on Secondary Education in America. The Carnegie Foundation for the Advancement of Teaching. New York, NY: Harper and Row.

Bracey, Gerald W. (1985, April 5). Advocates of Basic Skills "Know What Ain't So". Education Week (loc.).

Bureau of the Census. (1992, January). Statistical Abstract of the United States 1992 (110th edition). Washington DC: U.S. Department of Commerce.

California Educational Partnership Consortium. (1990, March). Partnerships for Education Renewal: Report of the Partnership Institute. Los Angeles, CA: Author.

California State Department of Education. (1992). Educational Code. Los Angeles, CA: Author

California State Department of Education. (1992). Second to None: A Vision of the New California High School. The Report of the California High School Task Force.

Carnegie Council on Adolescent Development Task Force on Education of Young Adolescents. (1989, June). Turning Point: Preparing American Youth for the 21st Century, New York, NY: Carnegie Corporation of New York.

Carnevale, Anthony P. & Gainer, Leila J. (1989, February). The Learning Enterprise. Washington, DC: The American Society for Training & Development, U.S. Department of Labor, and Employment & Training Administration.

Center for Occupational Research and Development (CORD). (1992, January). National Tech Prep Network Newsletter. Waco, TX: Author.

Clark, Donald M. (1991, February/March). Focus on Reform. Thrust for Educational Leadership, Vol. 20, No. 5. Sacramento, CA: Association of California School Administrators.

Database Publishing Company. (1991). 1991 California Services Register. Newport Beach, CA: Author.

Deshler, D., & Schumaker, J. (1986). Learning Strategies: An Instructional Alternative for Low-Achieving Adolescents. Exceptional Children, Vol. 52, pp. 589-590.

Drucker, Peter F. (1989). The New Realities: In Government and Politics/In Economics and Business/ In Society and World Views. New York, NY: Harper and Row.

Dweck, Carol S. (1986, October). Motivational Processes Affecting Learning. American Psychologist, pp. 1040-1048.

Dweck, Carol S., and Leggett, E. L. (1986). A Social-Cognitive Approach to Motivation and Personality. Psychological Review, Vol. 95, pp. 256-273.

Eurich, N. P. (1985). Corporate Classrooms. A Carnegie Foundation Special Report. Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching.

Evans, Rupert N. (1971). Foundations of Vocational Education. Columbus, OH: Charles E. Merrill Publishing Company.

Executive Office of the President: Office of Management and Budget. (1987). Standard Industrial Classification Manual. PB 87-100012. Springfield, VA: National Technical Information Service.

Galotti, K. M.. (1989). Approaches to Studying Formal and Everyday Reasoning. Psychological Bulletin, Vol. 105, pp. 331-351, 1989.

Ghiselli, E. E. (Winter, 1973). The Validity of Aptitude Tests in Personnel Selection. Psychology, Vol. 26, No. 4, pp. 461-477.

Gulliford, J. P. (1959). Three Faces of Intellect. American Psychologist, Vol. 14, pp. 469-479.

Hunter, J. E. (1980). Validity Generalization for 12,000 Jobs: An Application of Synthetic Validity and Validity Generalization to the General Aptitude Test Battery (GATB). Washington, DC: U.S. Employment Service and U.S. Department of Labor.

Hunter, J. E. and Hunter, R. F. (1982, June 21). The Validity and Utility of Alternative Predictors of Job Performance. Report submitted to the U.S. Office of Personnel Management.

Illinois Renewal Institute, Incorporated. (Undated video). Teachers Teaching Thinking. Chicago, IL: Illinois Renewal Institute, Incorporated.

Isaac, Stephen and Michael, William B.. (1982). Handbook in Research and Evaluation for Education and Behavioral Science. 2nd Edition.

Keppel, Geoffrey. (1982). Design and Analysis: A researcher's Handbook. 2nd Edition. Englewood Cliffs, NJ: Prentice-Hall.

Key, James P. (1990). Course Guide for AGED 5980. Stillwater, OK: Oklahoma State University.

Kozol, Jonathan. (1985, March 13). Dehumanizing the Humanities. The Chronicle of Higher Education, Vol. 8.

McLaughlin, Ann, Bennett, William J., and Verity, C. William. (1988). A joint initiative. Building a Quality Workforce. Washington, DC: U.S. Department of Labor, U.S. Department of Education, and U.S. Department of Commerce.

Marzano, Robert J. and Ewye, Robert W. (1989, August). Thinking for Tomorrow. Vocational Education Journal, Vol. 4, pp. 28-31.

Miller, Melvin D. (1992). Comments on Research Report. Stillwater, OK: Oklahoma State University, School of Occupational and Adult Education.

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. (1984). High Schools and the Changing Workplace: The Employers' View. Report of the Panel on Secondary School Education for the Changing Workplace. Washington, DC: National Academy Press.

National Center for Research in Vocational Education. (1987A). Targeting Teaching Techniques (1978). Basics: Bridging Vocational and Academic Skills. (Includes: Technique for Management: Time for Learning, Technique for Remediation: Peer Tutoring, Technique for Computer Use: Software Evaluation, Technique for Individualization: The Academic Development Plan, and Technique for Joint Effort: The Vocational-Academic Approach. Columbus, OH: Author.

National Center for Research in Vocational Education. (1987B). The Bridger's Guide. Basics: Bridging Vocational and Academic Skills. (Includes: Implementation Guide, Support Roles for Basic Skills, Primer of Exemplary Strategies, and Roadsigns from Research). Columbus, OH: Author.

National Center for Research in Vocational Education. (1991, January). The 1991 Agenda for the National Center for Research in Vocational Education. Berkeley, CA: Author.

National Commission on Excellence in Education. (1983). A Nation at Risk: The Imperative for Educational Reform. An Open Letter to the American People. A Report to the Nation and the Secretary of Education. Washington, DC: U.S. Government Printing Office. (Eric Document Reproduction Service No. ED 226 006)

National Council of Supervisors of Mathematics. (1979). Position Paper on Basic Mathematical Skills. What Do We Know About Standards for Effective Basic Skills Programs? Position paper on basic mathematical skills. Washington, DC: U.S. Skills Improvement Program.

Niederhaus, Sharon. (1991, February/March). Marketing Partnerships. Thrust for Educational Leadership, Vol. 20, No. 5, p. 22. Sacramento, CA: Association of California School Administrators.

Northwest Regional Educational Laboratory. (1982, November). Learning Responsibility: The Importance of the Home, School and Workplace. Ideas for Action in Education and Work. Portland, OR: Author.

Northwest Regional Educational Laboratory. (1983, November). Striving for Excellence: Applications of Successful Business Principles. Ideas for Action in Education and Work. Portland, OR: Author.

Northwest Regional Educational Laboratory. (1984, November). Technological Literacy: What Industry Can Offer. Ideas for Action in Education and Work, Portland, OR: Author.

Norton, Robert E., King-Fitch, Catherine C., & Harrington, Lois G. (1986). Improving the Basic Skills of Vocational-Technical Students: An Administrator's Guide. Columbus, Ohio: National Center for Research in Vocational Education.

Norton, Robert E., King-Fitch, Catherine C., Harrington, Lois G., & Kopp, Kathleen. (1987). Integration of Academic and Vocational-Technical Education: An Administrator's Guide. Columbus, OH: National Center for Research in Vocational Education.

Oakes, Jack & Thomas, Diane. (1991, February/March). A Sound Investment. Thrust for Educational Leadership, Vol. 20, No. 5, pp. 12-14. Sacramento, CA: Association of California School Administrators.

Parnell, Dale. (1991). The Neglected Majority. Washington, DC: Community College Press.

Pearlman, K., Schmidt, F. L., & Hunter, J. E. (1980, August). Validity Generalization Results for Tests Used to Predict Training Success and Job Proficiency in clerical Occupations. Journal of Applied Psychology, Vol. 6, No. 4, pp. 373-406.

Pritz, Sandra G. (1989, August). Reasoning Skills for All Students. Vocational Education Journal, Vol. 29.

Pritz, Sandra G., & Crowe, Michael R. (1987). Techniques for Joint Effort: The Vocational-Academic Approach. Columbus, OH: The National Center for Research in Vocational Education.

Resnick, Lauren. (1987, December). Learning in School and Out. Educational Researcher, Vol. 8, pp. 173-190.

Rosenfeld, Sturart A. (1988, June 22). Educating for the Factories of the Future. Education Week.

Scheuber, Leo. (1991). Professional conversations with the Stanislaus/Tuolumne/Mono Regional Occupational Program.

Schmidt, F. L. & Hunter, J. E. (1991, October). Employment Testing: Old Theories and New Research Findings. American Psychology, Vol. 65, No. 10, pp. 1128-1137.

Schnieders, W. Robert. (1989, December). Measuring Workplace Literacy Skills. A presentation to the American Vocational Association. St. Louis, MO: Educational Data Systems, Incorporated.

Sechler, Judith A., Crowe, Michael R. (1987). Roadsigns from Research. Basics: Bridging Vocational and Academic Skills. Columbus, OH: National Center for Research in Vocational Education.

Sheinker, J., and Sheinker, A. (1982). Study Strategies: A Metacognitive Approach. Rock Springs, WY: White Mountain.

Smith, Deborah. (February/March 1991). School to Work: Making the Transition. Thrust for Educational Leadership, Vol. 20, No. 5, pp. 10-11. Sacramento, CA: Association of California School Administrators.

Stasz, Cathleen; McArthur, David; Lewis, Matthew; and Ramsey, Kimberly. (1990, December). Teaching and Learning Generic Skills for the Workplace. Berkeley, CA: National Center for Research in Vocational Education.

Teachers Teaching Thinking. (Undated). Kankakee, IL: Illinois Renewal Institute, Incorporated. (video designed to show how to infuse thinking skills into your curriculum).

Trout, Francis. (1991). Conversations with the Modesto City School Supervisor of Vocational Education.

U.S. Department of Labor. (1991, June). What Work Requires of Schools: A SCANS REport for America 2000. The Secretary's Commission on Achieving Necessary Skills. Washington, DC: Author.

U.S. News and World Report. (1989, June 26). The Forgotten Half. U.S. News & World Report, Vol. 9, pp. 45-53.

Williams, J. (1991). Notes from a course in statistical research.

Witte, Robert S. (1985). Statistics. Second Edition. New York, NY: Holt, Rinehart and Winston.

Woodring, Paul. (1983). The Persistent Problem of Education. Bloomington, IN: Phi Delta Kappa Education Foundation, Vol. 122.

Woods & Poole Economics, Inc. (1990, May). 1990 State Profile - California. Washington, DC: Author.

Zemke, Ron. (1989, June). Workplace Illiteracy: Shall We Overcome? Training, Vol. 7, pp. 33-39.

APPENDIXES

APPENDIX A

CENSUS TABLES

Labor Force, Employment, and Earnings

No. 631. Occupation of Employed Civilians, by Sex, Race, and Educational Attainment: 1991

[In thousands. Annual averages of monthly figures. For civilian noninstitutional population 25 years and over. Based on Current Population Survey; see text, section 1 and Appendix III]

SEX, RACE, AND YEARS OF SCHOOL	Total employed	Managerial/ professional	Tech./ sales/ administrative	Service [1]	Precision production [2]	Operators/ fabricators [3]	Farming, forestry, fishing
Male, total [4]	54,293	15,649	10,649	4,508	10,696	10,249	2,341
Less than 4 years of high school	7,676	413	595	986	2,038	2,827	816
4 years of high school only	19,831	2,313	3,453	1,974	5,674	5,435	980
1 to 3 years of college	11,007	2,744	3,113	1,067	2,267	1,499	317
4 years of college or more	15,779	10,378	3,489	480	716	488	228
White	47,483	14,464	9,425	3,449	9,640	8,396	2,109
Less than 4 years of high school	6,420	367	511	729	1,818	2,302	693
4 years of high school only	17,248	2,130	3,082	1,479	5,151	4,507	898
1 to 3 years of college	9,648	2,513	2,735	856	2,045	1,203	296
4 years of college or more	14,168	9,453	3,096	385	627	384	222
Black	4,957	758	819	832	810	1,566	173
Less than 4 years of high school	1,014	30	59	202	180	447	96
4 years of high school only	2,101	127	296	396	413	808	60
1 to 3 years of college	1,051	167	287	173	164	246	13
4 years of college or more	791	435	175	60	53	85	3
Female, total [4]	44,723	13,300	18,856	7,321	1,030	3,739	476
Less than 4 years of high school	4,729	244	1,016	1,905	220	1,238	105
4 years of high school only	18,628	2,486	9,583	3,758	549	2,013	239
1 to 3 years of college	10,032	2,831	5,336	1,238	176	370	61
4 years of college or more	11,335	7,739	2,921	419	85	119	52
White	38,055	11,799	16,455	5,591	854	2,909	447
Less than 4 years of high school	3,709	214	903	1,346	188	968	92
4 years of high school only	15,960	2,249	8,537	2,912	459	1,576	227
1 to 3 years of college	8,541	2,523	4,530	992	139	280	78
4 years of college or more	9,844	6,813	2,465	341	70	85	51
Black	5,121	1,061	1,845	1,431	119	647	17
Less than 4 years of high school	825	22	85	486	22	203	8
4 years of high school only	2,176	183	854	710	83	358	8
1 to 3 years of college	1,211	240	672	197	27	74	2
4 years of college or more	909	617	234	38	7	13	-

- Represents or rounds to zero. [1] Includes private household workers. [2] Includes craft and repair. [3] Includes laborers. [4] Includes other races, not shown separately.

Source: U.S. Bureau of Labor Statistics, unpublished data.

No. 632. Employment by Industry, 1970 to 1991, and by Selected Characteristics, 1991

[In thousands, except percent. See headnote, table 610. Data from 1985 forward not strictly comparable with earlier years due to changes in industrial classification]

INDUSTRY	1970	1980	1985	1989	1990	1991			
						Total	Percent		
							Female	Black	Hispanic [1]
Total employed	78,678	99,303	107,150	117,342	117,914	116,877	45.6	10.1	7.5
Agriculture	3,463	3,364	3,179	3,199	3,186	3,233	21.1	5.0	14.0
Mining	516	979	939	719	730	733	17.6	5.4	6.6
Construction	4,818	6,215	6,987	7,680	7,696	7,087	8.5	6.8	6.4
Manufacturing	20,746	21,942	20,879	21,652	21,184	20,434	32.7	10.3	8.5
Transportation, communication, and other public utilities	5,320	6,525	7,548	8,094	8,136	8,204	28.8	13.9	8.1
Wholesale and retail trade	15,008	20,191	22,296	24,230	24,269	24,055	46.9	7.9	8.4
Wholesale trade	2,672	3,920	4,341	4,611	4,651	4,640	29.0	5.6	7.3
Retail trade	12,336	16,270	17,955	19,618	19,618	19,415	51.2	8.5	8.6
Finance, insurance, real estate	3,945	5,993	7,005	7,988	8,021	7,786	59.1	6.7	5.6
Banking and other finances	1,697	2,568	3,135	3,447	3,434	3,287	64.1	9.8	6.3
Insurance and real estate	2,248	3,425	3,870	4,542	4,587	4,500	55.4	8.1	5.2
Services [2]	20,385	28,752	33,322	38,227	39,084	39,705	61.9	11.4	8.8
Business services [2]	1,403	2,361	3,999	5,268	5,325	5,385	47.3	10.7	7.4
Advertising	147	191	263	282	277	255	48.7	4.7	4.1
Services to dwellings and buildings	(NA)	370	571	801	813	833	51.3	17.5	18.5
Personnel supply services	(NA)	235	590	786	704	658	67.9	18.1	5.4
Business management/consulting	(NA)	307	395	557	604	610	47.8	8.4	3.5
Computer and data processing	(NA)	221	549	797	799	847	36.5	5.1	2.8
Detective/protective services	(NA)	213	316	384	373	399	19.7	25.1	9.1
Automobile services	600	952	1,322	1,391	1,429	1,435	12.3	8.7	11.8
Personal services [2]	4,276	3,639	4,352	4,664	4,667	4,675	70.4	14.3	12.3
Private households	1,782	1,257	1,254	1,108	1,023	1,000	85.9	21.4	18.9
Hotels and lodging places	979	1,149	1,451	1,895	1,780	1,813	63.4	14.5	12.7
Entertainment and recreation	717	1,047	1,278	1,440	1,503	1,570	39.7	9.1	7.7
Professional and related services [2]	12,904	19,853	21,563	24,809	25,335	25,835	69.0	11.5	5.2
Hospitals	2,843	4,038	4,269	4,568	4,890	4,839	77.3	16.0	5.5
Health services, except hospitals	1,628	3,345	3,641	4,542	4,757	4,978	78.0	12.4	5.9
Elementary, secondary schools	6,126	5,550	5,431	5,970	6,026	6,116	73.4	11.2	5.4
Colleges and universities	(3)	2,108	2,281	2,514	2,609	2,570	52.7	9.0	4.3
Social services	828	1,590	1,682	2,110	2,234	2,350	80.2	18.3	6.8
Legal services	429	778	995	1,207	1,217	1,274	55.2	5.2	4.0
Public administration [4]	4,476	5,342	4,995	5,553	5,608	5,639	41.8	15.2	5.6

NA Not available. [1] Persons of Hispanic origin may be of any race. [2] Includes industries not shown separately. [3] Included with el/sec schools. [4] Includes workers involved in uniquely governmental activities, e.g., judicial and legislative.

Source: U.S. Bureau of Labor Statistics, *Employment and Earnings*, monthly, January issues.

Employment by Industry, with Projections

No. 633. Employment by Selected Industry, 1975 to 1990, and Projections, 2005

[In thousands, except percent. Figures may differ from those in other tables since these data exclude establishments not elsewhere classified (SIC 99); in addition, agriculture services (SIC 074, 5, 8) are included in agriculture, not services. See source for details. N.e.c. means not elsewhere classified. Minus sign (-) indicates decrease]

1987 SIC [1] code	INDUSTRY	EMPLOYMENT			ANNUAL AVERAGE RATE OF CHANGE	
		1975	1990	2005 [2]	1975-1990	1990-2005 [2]
(X)	Total	87,668	122,570	147,190	2.3	1.2
(X)	Nonfarm wage and salary	76,680	109,319	132,647	2.4	1.3
(X)	Goods-producing (excluding agriculture)	22,600	24,958	25,241	0.7	0.1
10-14	Mining	752	711	668	-0.4	-0.4
15,16,17	Construction	3,525	5,136	6,059	2.5	1.1
20-39	Manufacturing	18,323	19,111	18,514	0.3	-0.2
24,25,32-39	Durable manufacturing	10,662	11,115	10,517	0.3	-0.4
24	Lumber and wood products	627	741	722	1.1	-0.2
25	Furniture and fixtures	417	510	618	1.4	1.3
32	Stone, clay and glass products	598	557	516	-0.5	-0.5
33	Primary metal industries	1,139	756	643	-2.7	-1.1
331	Blast furnaces/basic steel products	548	275	222	-4.5	-1.4
34	Fabricated metal products	1,453	1,423	1,238	-0.1	-0.9
35	Industrial machinery and equipment	2,076	2,095	1,941	0.1	-0.5
3571,2,5,7	Computer equipment	210	396	345	4.3	-0.9
36	Electronic and other electric equipment [3]	1,442	1,673	1,567	1.0	-0.4
3661	Telephone and telegraph apparatus	148	128	110	-1.0	-1.0
3674	Semiconductors and related devices	122	238	235	4.6	-0.1
37	Transportation equipment	1,700	1,980	1,889	1.0	-0.3
371	Motor vehicles and equipment	792	809	744	0.1	-0.6
38	Instruments and related products [3]	804	1,004	1,018	1.5	0.1
382	Measuring/controlling devices, watches	326	334	271	0.2	-1.4
3841-3	Medical instruments and supplies	109	206	282	4.3	2.1
39	Miscellaneous manufacturing industries	407	377	364	-0.5	-0.2
20-23,26-31	Nondurable manufacturing	7,661	7,995	7,998	0.3	-
20	Food and kindred products	1,658	1,668	1,560	-	-0.4
21	Tobacco manufactures	76	49	34	-2.9	-2.5
22	Textile mill products	868	691	596	-1.5	-1.0
23	Apparel and other textile products	1,243	1,043	848	-1.2	-1.4
26	Paper and allied products	633	699	727	0.7	0.3
27	Printing and publishing	1,063	1,574	1,900	2.5	1.3
28	Chemicals and allied products	1,015	1,093	1,098	0.5	-
29	Petroleum and coal products	194	158	122	-1.4	-1.7
30	Rubber/misc. plastics products	643	889	1,043	2.2	1.1
31	Leather and leather products	248	132	72	-4.1	-4.0
(X)	Service producing	54,080	84,363	107,405	3.0	1.6
40-42,44-49	Transportation, communications, utilities	4,542	5,826	6,689	1.7	0.9
40-42,44-47	Transportation	2,834	3,554	4,427	2.0	1.5
48	Communications	1,176	1,311	1,143	0.7	-0.9
49	Electric, gas, and sanitary services	733	961	1,119	1.8	1.0
50,51	Wholesale trade	4,430	6,205	7,210	2.3	1.0
52-59	Retail trade	12,630	19,683	24,804	3.0	1.6
58	Eating and drinking places	3,380	6,565	8,712	4.5	1.9
60-67	Finance, insurance, and real estate	4,165	6,739	8,129	3.3	1.3
70-87,89	Services	13,627	27,588	39,058	4.6	2.3
70	Hotels and other lodging places	898	1,649	2,174	4.1	1.9
72	Personal services	782	1,113	1,338	2.4	1.2
73	Business services [3]	1,697	5,241	7,623	7.8	2.5
731	Advertising	122	238	345	4.6	2.5
734	Services to buildings	391	809	995	5.0	1.4
736	Personnel supply services	242	1,559	2,068	13.2	1.9
737	Computer and data processing services	143	784	1,494	12.0	4.4
75	Auto repair, services, and garages	439	928	1,245	5.1	2.0
76	Miscellaneous repair shops	218	390	480	4.0	1.4
78	Motion pictures	206	408	476	4.7	1.0
784	Video tape rental	(NA)	132	150	(NA)	0.8
79	Amusement and recreation services	613	1,089	1,428	3.9	1.8
80	Health services	4,134	7,844	11,519	4.4	2.6
801,2,3,4	Offices of health practitioners	936	2,180	3,470	5.8	3.1
805	Nursing and personal care facilities	759	1,420	2,182	4.3	2.9
806	Hospitals, private	2,274	3,547	4,605	3.0	1.8
807,8,9	Health services, n.e.c.	165	697	1,262	10.1	4.0
81	Legal services	341	919	1,427	6.8	3.0
82	Educational services	1,001	1,652	2,326	3.4	2.3
83	Social services	690	1,811	2,874	6.6	3.1
84,86,8733	Museums, zoos, and membership organizations	1,573	2,149	2,488	2.1	1.0
87,89	Engineering, management, and services n.e.c. [4]	(NA)	2,396	3,660	(NA)	2.9
(X)	Government	14,686	18,322	21,515	1.5	1.1
(X)	Federal government	2,748	3,085	3,184	0.8	0.2
(X)	State and local government	11,937	15,237	18,331	1.6	1.2
01,02,07,08,09	Agriculture	3,459	3,276	3,080	-0.4	-0.4
88	Private households	1,362	1,014	700	-1.9	-2.4
(X)	Nonag. self-employed and unpaid family	6,165	8,961	10,763	2.5	1.2

- Represents or rounds to zero. NA Not available. X Not applicable. [1] 1987 Standard Industrial Classification; see text, section 13. [2] Based on assumptions of moderate growth; see source. [3] Includes other industries, not shown separately. [4] Excludes SIC 8733.

Source: U.S. Bureau of Labor Statistics, *Monthly Labor Review*, November 1991.

APPENDIX B

SCANS COMPETENCIES AND FOUNDATION

★

FIVE COMPETENCIES

Resources: Identifies, organizes, plans, and allocates resources

A. *Time*—Selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules
B. *Money*—Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
C. *Material and Facilities*—Acquires, stores, allocates, and uses materials or space efficiently
D. *Human Resources*—Assesses skills and distributes work accordingly, evaluates performance and provides feedback

Interpersonal: Works with others

A. *Participates as Member of a Team*—contributes to group effort
B. *Teaches Others New Skills*
C. *Serves Clients/Customers*—works to satisfy customers' expectations
D. *Exercises Leadership*—communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies
E. *Negotiates*—works toward agreements involving exchange of resources, resolves divergent interests
F. *Works with Diversity*—works well with men and women from diverse backgrounds

Information: Acquires and uses information

A. *Acquires and Evaluates Information*
B. *Organizes and Maintains Information*
C. *Interprets and Communicates Information*
D. *Uses Computers to Process Information*

Systems: Understands complex inter-relationships

A. *Understands Systems*—knows how social, organizational, and technological systems work and operates effectively with them
B. *Monitors and Corrects Performance*—distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions
C. *Improves or Designs Systems*—suggests modifications to existing systems and develops new or alternative systems to improve performance

Technology: Works with a variety of technologies

A. *Selects Technology*—chooses procedures, tools or equipment including computers and related technologies
B. *Applies Technology to Task*—Understands overall intent and proper procedures for setup and operation of equipment
C. *Maintains and Troubleshoots Equipment*—Prevents, identifies, or solves problems with equipment, including computers and other technologies

★

- estimate discounts on the spot while negotiating sales;
- use spreadsheet programs to monitor expenditures;
- employ statistical process control procedures to check quality; and
- project resource needs over the next planning period.

Finally, very few of us will work totally by ourselves. More and more, work involves listening carefully to clients and co-workers and clearly articulating one's own point of view. Today's

A THREE-PART FOUNDATION

Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks

A. *Reading*—locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules

B. *Writing*—communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts

C. *Arithmetic/Mathematics*—performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques

D. *Listening*—receives, attends to, interprets, and responds to verbal messages and other cues

E. *Speaking*—organizes ideas and communicates orally

Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons

A. *Creative Thinking*—generates new ideas

B. *Decision Making*—specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative

C. *Problem Solving*—recognizes problems and devises and implements plan of action

D. *Seeing Things in the Mind's Eye*—organizes, and processes symbols, pictures, graphs, objects, and other information

E. *Knowing How to Learn*—uses efficient learning techniques to acquire and apply new knowledge and skills

F. *Reasoning*—discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem

Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty

A. *Responsibility*—exerts a high level of effort and perseveres towards goal attainment

B. *Self-Esteem*—believes in own self-worth and maintains a positive view of self

C. *Sociability*—demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings

D. *Self-Management*—assesses self accurately, sets personal goals, monitors progress, and exhibits self-control

E. *Integrity/Honesty*—chooses ethical courses of action

APPENDIX C

RESEARCH INSTRUMENT

WORKPLACE BASICS QUESTIONNAIRE

DIRECTIONS For each named item, please rank that item by circling the number which reflects your opinion of that competency's importance for success in your workplace. Please do not omit a response, as failure to respond to all of the items may void the questionnaire for use in this research.

RESPONSE SCALES

1	2	3	4	5
definitely not important	probably not important	could be important	important	very important

The success of an employee with our firm depends on his/her ability to:

1.	Manage Time -- Select goal-relevant activities, rank them, allocate time, and prepare and follow schedules	1	2	3	4	5
2.	Manage Money -- Use or prepares budgets, make forecasts, keep records, and make adjustments to meet objectives	1	2	3	4	5
3.	Manage Material and Facilities -- Acquire, store, allocate and use materials	1	2	3	4	5
4.	Manage Human Resources -- Assess skills and distribute work accordingly, evaluate performance and provide feedback	1	2	3	4	5
5.	Participates as Member of a Team -- Contributes to group effort	1	2	3	4	5
6.	Teach Others New Skills	1	2	3	4	5
7.	Serve Clients/Customers -- Works to satisfy customers' expectations	1	2	3	4	5
8.	Exercise Leadership -- Communicates ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies	1	2	3	4	5
9.	Negotiate -- Work toward agreements involving exchange of resources, resolve divergent interests	1	2	3	4	5
10.	Work with Diversity -- Work well with men and women from diverse backgrounds	1	2	3	4	5
11.	Acquire and Evaluate Information	1	2	3	4	5
12.	Organize and Maintain Information	1	2	3	4	5
13.	Interpret and Communicate Information	1	2	3	4	5
14.	Use Computers to Process Information	1	2	3	4	5
15.	Understand Systems -- Know how social, organizational, and technological systems work and operate effectively with them	1	2	3	4	5

1 definitely not important	2 probably not important	3 could be important	4 important	5 very important

16.	Monitor and Correct Performance -- Distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions	1	2	3	4	5
17.	Improve or Design Systems -- Suggest modifications to existing systems and develop new or alternative system to improve performance	1	2	3	4	5
18.	Select Technology -- Choose procedures, tools or equipment including computers and related technologies	1	2	3	4	5
19.	Apply Technology to Task -- Understand overall intent and proper procedures for setup and operation of equipment	1	2	3	4	5
20.	Maintain and Troubleshoot Equipment -- Prevent identify or solve problems with equipment.	1	2	3	4	5
21.	Read -- Locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules	1	2	3	4	5
22.	Write -- Communicate thoughts, ideas, information, and messages in writing; and create documents such as letters, directions, manuals, reports, graphs, and flow charts	1	2	3	4	5
23.	Do Math --Perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques	1	2	3	4	5
24.	Listen -- Receive, attend to, interpret, and respond to verbal messages and other cues	1	2	3	4	5
25.	Speak -- Organize ideas and communicate orally	1	2	3	4	5
26.	Think Creatively -- Generate new ideas	1	2	3	4	5
27.	Make Decisions -- Specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative	1	2	3	4	5
28.	Solve Problems -- Recognize problems and devise and implement a plan of action	1	2	3	4	5
29.	See Things in the Mind's Eye -- Organize, and process symbols, pictures, graphs, objects, and other information	1	2	3	4	5
30.	Know How to Learn -- Use efficient learning techniques to acquire and apply new knowledge and skills	1	2	3	4	5

1 definitely not important	2 probably not important	3 could be important	4 important	5 very important

31.	Reason -- Discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem	1	2	3	4	5
32.	Be Responsible -- Exert a high level of effort and perseveres toward goal attainment	1	2	3	4	5
33.	Maintain Self-Esteem -- Believe in own self-worth and maintain a positive view of self	1	2	3	4	5
34.	Socialize -- Demonstrate understanding, friendliness and adaptability, empathy, and politeness in group settings	1	2	3	4	5
35.	Exercise Self-Management -- Assess self accurately, set personal goals, monitor progress, and exhibit self-control	1	2	3	4	5
36.	Be Honest and Maintain Integrity -- Choose ethical courses of action	1	2	3	4	5

RESPONDENT INFORMATION (check one response for each area)

Position: _____Site-level CEO
_____HRD
_____First-level Manager

Sex: _____Male
_____Female

Age: _____under 30
_____30-39
_____40-49
_____50-59
_____60 and over

Education: _____Elementary graduate
_____High school graduate
_____A.A.
_____B.A. or B.S.
_____Masters degree
_____Doctorate

APPENDIX D

T-TESTS

TTEST PROCEDURE

Variable: C1

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.48837209	0.55084753	0.08400346	3.00000000	5.00000000	Unequal	1.0758	82.1	0.2852
RESP	184	4.38043478	0.74426612	0.05486803	1.00000000	5.00000000	Equal	0.8948	225.0	0.3719

For HO: Variances are equal, F' = 1.83 DF = (183,42) Prob>F' = 0.0229

****

Variable: C2

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.51162791	1.03215201	0.15740171	2.00000000	5.00000000	Unequal	-0.0267	63.7	0.9788
RESP	184	3.51630435	1.04528890	0.07705972	1.00000000	5.00000000	Equal	-0.0265	225.0	0.9789

For HO: Variances are equal, F' = 1.03 DF = (183,42) Prob>F' = 0.9575

****

Variable: C3

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.30232558	0.91378031	0.13935019	1.00000000	5.00000000	Unequal	0.9398	71.0	0.3505
RESP	184	3.15217391	1.06031012	0.07816710	1.00000000	5.00000000	Equal	0.8569	225.0	0.3924

For HO: Variances are equal, F' = 1.35 DF = (183,42) Prob>F' = 0.2555

****

Variable: C4

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.81395349	1.00607237	0.15342460	2.00000000	5.00000000	Unequal	-0.3588	62.8	0.7209
RESP	184	3.87500000	0.99760643	0.07354452	1.00000000	5.00000000	Equal	-0.3607	225.0	0.7187

For HO: Variances are equal, F' = 1.02 DF = (42,183) Prob>F' = 0.9042

****

Variable: C5

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.55813953	0.54782364	0.08354232	3.00000000	5.00000000	Unequal	-0.2958	75.4	0.7682
RESP	184	4.58695652	0.67995779	0.05012715	1.00000000	5.00000000	Equal	-0.2588	225.0	0.7960

For HO: Variances are equal, F' = 1.54 DF = (183,42) Prob>F' = 0.0990

TTEST PROCEDURE

Variable: C6

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.72093023	0.98381138	0.15002983	2.00000000	5.00000000	Unequal	-0.3111	58.5	0.7569
RESP	184	3.77173913	0.87594771	0.06457572	2.00000000	5.00000000	Equal	-0.3344	225.0	0.7384

For HO: Variances are equal, F' = 1.26 DF = (42,183) Prob>F' = 0.3026

****

Variable: C7

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.74418605	0.65802820	0.10034836	2.00000000	5.00000000	Unequal	0.0961	58.3	0.9237
RESP	184	4.73369565	0.58183376	0.04289335	2.00000000	5.00000000	Equal	0.1038	225.0	0.9174

For HO: Variances are equal, F' = 1.28 DF = (42,183) Prob>F' = 0.2754

****

Variable: C8

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.93023256	0.88358978	0.13474618	2.00000000	5.00000000	Unequal	-0.3615	60.3	0.7190
RESP	184	3.98369565	0.82631279	0.06091659	1.00000000	5.00000000	Equal	-0.3770	225.0	0.7066

For HO: Variances are equal, F' = 1.14 DF = (42,183) Prob>F' = 0.5414

****

Variable: C9

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.76744186	0.92162407	0.14054635	2.00000000	5.00000000	Unequal	0.0758	66.7	0.9398
RESP	184	3.75543478	0.99175443	0.07311311	1.00000000	5.00000000	Equal	0.0724	225.0	0.9423

For HO: Variances are equal, F' = 1.16 DF = (183,42) Prob>F' = 0.5861

****

Variable: C10

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.02325581	0.83061572	0.12666771	2.00000000	5.00000000	Unequal	-1.1558	69.6	0.2517
RESP	184	4.19021739	0.94186883	0.06943549	2.00000000	5.00000000	Equal	-1.0690	225.0	0.2862

For HO: Variances are equal, F' = 1.29 DF = (183,42) Prob>F' = 0.3380

TTEST PROCEDURE

Variable: C11

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.18604651	0.76394384	0.11650034	2.00000000	5.00000000	Unequal	0.1376	60.0	0.8910
RESP	184	4.16847826	0.70817696	0.05220750	2.00000000	5.00000000	Equal	0.1443	225.0	0.8854

For HO: Variances are equal, F' = 1.16 DF = (42,183) Prob>F' = 0.4932

****

Variable: C12

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.20930233	0.70906174	0.10813090	2.00000000	5.00000000	Unequal	0.5625	64.7	0.5757
RESP	184	4.14130435	0.73300820	0.05403808	2.00000000	5.00000000	Equal	0.5510	225.0	0.5822

For HO: Variances are equal, F' = 1.07 DF = (183,42) Prob>F' = 0.8249

****

Variable: C13

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.32558140	0.71450716	0.10896132	3.00000000	5.00000000	Unequal	0.0876	58.0	0.9305
RESP	184	4.31521739	0.62601782	0.04615065	3.00000000	5.00000000	Equal	0.0951	225.0	0.9243

For HO: Variances are equal, F' = 1.30 DF = (42,183) Prob>F' = 0.2419

****

Variable: C14

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.30232558	0.93947513	0.14326861	2.00000000	5.00000000	Unequal	2.2215	61.6	0.0300
RESP	184	3.95108696	0.90704523	0.06686826	1.00000000	5.00000000	Equal	2.2708	225.0	0.0241

For HO: Variances are equal, F' = 1.07 DF = (42,183) Prob>F' = 0.7321

****

Variable: C15

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.53488372	0.98437404	0.15011563	1.00000000	5.00000000	Unequal	-0.2526	58.1	0.8014
RESP	184	3.57608696	0.86503035	0.06377088	1.00000000	5.00000000	Equal	-0.2738	225.0	0.7845

For HO: Variances are equal, F' = 1.29 DF = (42,183) Prob>F' = 0.2525

TTEST PROCEDURE

Variable: C16

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.53488372	1.05444269	0.16080100	1.00000000	5.00000000	Unequal	0.5351	60.9	0.5945
RESP	184	3.44021739	1.00093506	0.07378991	1.00000000	5.00000000	Equal	0.5527	225.0	0.5810

For HO: Variances are equal, F' = 1.11 DF = (42,183) Prob>F' = 0.6280

****

Variable: C17

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.44186047	0.95872747	0.14620457	1.00000000	5.00000000	Unequal	0.9107	63.9	0.3659
RESP	184	3.29347826	0.97552613	0.07191674	1.00000000	5.00000000	Equal	0.9009	225.0	0.3686

For HO: Variances are equal, F' = 1.04 DF = (183,42) Prob>F' = 0.9267

****

Variable: C18

ROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.30232558	1.03590043	0.15797333	1.00000000	5.00000000	Unequal	2.0900	67.2	0.0404
RESP	184	2.92934783	1.12614610	0.08302059	1.00000000	5.00000000	Equal	1.9840	225.0	0.0485

For HO: Variances are equal, F' = 1.18 DF = (183,42) Prob>F' = 0.5314

****

Variable: C19

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.55813953	1.00717251	0.15359237	1.00000000	5.00000000	Unequal	1.1816	67.1	0.2415
RESP	184	3.35326087	1.09154236	0.08046957	1.00000000	5.00000000	Equal	1.1238	225.0	0.2623

For HO: Variances are equal, F' = 1.17 DF = (183,42) Prob>F' = 0.5477

****

Variable: C20

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.00000000	1.06904497	0.16302783	1.00000000	5.00000000	Unequal	0.8349	64.7	0.4069
RESP	184	2.84782609	1.10572067	0.08151481	1.00000000	5.00000000	Equal	0.8175	225.0	0.4145

For HO: Variances are equal, F' = 1.07 DF = (183,42) Prob>F' = 0.8217

TTEST PROCEDURE

Variable: C21

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.27906977	0.82593616	0.12595408	2.00000000	5.00000000	Unequal	1.3794	75.9	0.1718
RESP	184	4.07608696	1.03209369	0.07608696	1.00000000	5.00000000	Equal	1.2021	225.0	0.2306

For HO: Variances are equal, F' = 1.56 DF = (183,42) Prob>F' = 0.0890

****

Variable: C22

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.09302326	0.86778189	0.13233550	2.00000000	5.00000000	Unequal	-1.7232	59.5	0.0900
RESP	184	4.34239130	0.79420493	0.05854956	1.00000000	5.00000000	Equal	-1.8210	225.0	0.0699

For HO: Variances are equal, F' = 1.19 DF = (42,183) Prob>F' = 0.4270

****

Variable: C23

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.72093023	0.85427723	0.13027606	2.00000000	5.00000000	Unequal	-0.6347	69.6	0.5277
RESP	184	3.81521739	0.96868282	0.07141224	1.00000000	5.00000000	Equal	-0.5870	225.0	0.5578

For HO: Variances are equal, F' = 1.29 DF = (183,42) Prob>F' = 0.3381

****

Variable: C24

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.51162791	0.73588602	0.11222157	2.00000000	5.00000000	Unequal	-1.2991	56.0	0.1992
RESP	184	4.66847826	0.60407168	0.04453275	2.00000000	5.00000000	Equal	-1.4681	225.0	0.1435

For HO: Variances are equal, F' = 1.48 DF = (42,183) Prob>F' = 0.0812

****

Variable: C25

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.25581395	0.75885325	0.11572404	3.00000000	5.00000000	Unequal	-1.0246	60.2	0.3097
RESP	184	4.38586957	0.70750567	0.05215801	2.00000000	5.00000000	Equal	-1.0703	225.0	0.2856

For HO: Variances are equal, F' = 1.15 DF = (42,183) Prob>F' = 0.5244

TTEST PROCEDURE

Variable: C26

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.13953488	0.70984221	0.10824992	2.00000000	5.00000000	Unequal	0.2116	62.7	0.8331
RESP	184	4.11413043	0.70363328	0.05187253	3.00000000	5.00000000	Equal	0.2128	225.0	0.8317

For HO: Variances are equal, F' = 1.02 DF = (42,183) Prob>F' = 0.9020

****

Variable: C27

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.25581395	0.84777084	0.12928384	2.00000000	5.00000000	Unequal	-0.0758	54.9	0.9398
RESP	184	4.26630435	0.66919365	0.04933361	3.00000000	5.00000000	Equal	-0.0877	225.0	0.9302

For HO: Variances are equal, F' = 1.60 DF = (42,183) Prob>F' = 0.0362

****

Variable: C28

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.39534884	0.72832276	0.11106818	2.00000000	5.00000000	Unequal	0.4226	66.9	0.6740
RESP	184	4.34239130	0.78729442	0.05804011	2.00000000	5.00000000	Equal	0.4026	225.0	0.6876

For HO: Variances are equal, F' = 1.17 DF = (183,42) Prob>F' = 0.5615

****

Variable: C29

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.44186047	0.88107958	0.13436338	2.00000000	5.00000000	Unequal	-0.7283	71.7	0.4688
RESP	184	3.55434783	1.03347396	0.07618871	1.00000000	5.00000000	Equal	-0.6596	225.0	0.5102

For HO: Variances are equal, F' = 1.38 DF = (183,42) Prob>F' = 0.2223

****

Variable: C30

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.04651163	0.81513915	0.12430755	2.00000000	5.00000000	Unequal	-0.7297	61.9	0.4684
RESP	184	4.14673913	0.79285761	0.05845024	1.00000000	5.00000000	Equal	-0.7424	225.0	0.4586

For HO: Variances are equal, F' = 1.06 DF = (42,183) Prob>F' = 0.7792

TTEST PROCEDURE

Variable: C31

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	3.88372093	0.82257732	0.12544186	2.00000000	5.00000000	Unequal	-0.2491	63.5	0.8041
RESP	184	3.91847826	0.82903978	0.06111762	1.00000000	5.00000000	Equal	-0.2479	225.0	0.8045

For HO: Variances are equal, F' = 1.02 DF = (183,42) Prob>F' = 0.9890

****

Variable: C32

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.53488372	0.59156118	0.09021223	3.00000000	5.00000000	Unequal	-1.4296	56.4	0.1584
RESP	184	4.67391304	0.49276061	0.03632679	3.00000000	5.00000000	Equal	-1.6011	225.0	0.1108

For HO: Variances are equal, F' = 1.44 DF = (42,183) Prob>F' = 0.1066

****

Variable: C33

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.30232558	0.80281895	0.12242874	2.00000000	5.00000000	Unequal	-1.0399	57.4	0.3027
RESP	184	4.44021739	0.69085514	0.05093052	2.00000000	5.00000000	Equal	-1.1416	225.0	0.2548

For HO: Variances are equal, F' = 1.35 DF = (42,183) Prob>F' = 0.1845

****

Variable: C34

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.04651163	0.78538703	0.11977040	2.00000000	5.00000000	Unequal	-0.2212	64.3	0.8256
RESP	184	4.07608696	0.80617420	0.05943195	1.00000000	5.00000000	Equal	-0.2176	225.0	0.8279

For HO: Variances are equal, F' = 1.05 DF = (183,42) Prob>F' = 0.8701

****

Variable: C35

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.32558140	0.64442408	0.09827375	3.00000000	5.00000000	Unequal	-0.3003	65.6	0.7649
RESP	184	4.35869565	0.67882125	0.05004337	1.00000000	5.00000000	Equal	-0.2907	225.0	0.7716

For HO: Variances are equal, F' = 1.11 DF = (183,42) Prob>F' = 0.7080

TTEST PROCEDURE

Variable: C36

GROUP	N	Mean	Std Dev	Std Error	Minimum	Maximum	Variances	T	DF	Prob>|T|
NONR	43	4.74418605	0.53865013	0.08214338	3.00000000	5.00000000	Unequal	-1.1315	52.2	0.2630
RESP	184	4.84239130	0.38002982	0.02801617	3.00000000	5.00000000	Equal	-1.3995	225.0	0.1630

For HO: Variances are equal, F' = 2.01 DF = (42,183) Prob>F' = 0.0018

APPENDIX E

CHI SQUARE

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 7

TABLE OF GROUP BY MGMTLEV

GROUP MGMTLEV

Frequency Expected Percent Row Pct Col Pct	ceo	fl	hrd	Total
NONR	15 15.912 6.61 34.88 17.86	12 14.586 5.29 27.91 15.58	16 12.502 7.05 37.21 24.24	43 18.94
RESP	69 68.088 30.40 37.50 82.14	65 62.414 28.63 35.33 84.42	50 53.498 22.03 27.17 75.76	184 81.06
Total	84 37.00	77 33.92	66 29.07	227 100.00

STATISTICS FOR TABLE OF GROUP BY MGMTLEV

Statistic	DF	Value	Prob
Chi-Square	2	1.837	0.399
Likelihood Ratio Chi-Square	2	1.792	0.408
Mantel-Haenszel Chi-Square	1	0.849	0.357
Phi Coefficient		0.090	
Contingency Coefficient		0.090	
Cramer's V		0.090	

Sample Size = 227

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 8

TABLE OF GROUP BY AGE

GROUP AGE

Frequency
Expected
Percent
Row Pct
Col Pct

	over 50	Over 50	Over 50	Under 30	Under 40	Under 40	30-39	40-49	40-59	50-59	60+	Total
NONR	0 0.1894 0.00 0.00 0.00	0 0.1894 0.00 0.00 0.00	10 10.608 4.41 23.26 17.86	0 0.7577 0.00 0.00 0.00	12 15.912 5.29 27.91 14.29	0 0.1894 0.00 0.00 0.00	2 0.5683 0.88 4.65 66.67	19 12.502 8.37 44.19 28.79	0 0.1894 0.00 0.00 0.00	0 1.326 0.00 0.00 0.00	0 0.5683 0.00 0.00 0.00	43 18.94
RESP	1 0.8106 0.44 0.54 100.00	1 0.8106 0.44 0.54 100.00	46 45.392 20.26 25.00 82.14	4 3.2423 1.76 2.17 100.00	72 68.088 31.72 39.13 85.71	1 0.8106 0.44 0.54 100.00	1 2.4317 0.44 0.54 33.33	47 53.498 20.70 25.54 71.21	1 0.8106 0.44 0.54 100.00	7 5.674 3.08 3.80 100.00	3 2.4317 1.32 1.63 100.00	184 81.06
Total	1 0.44	1 0.44	56 24.67	4 1.76	84 37.00	1 0.44	3 1.32	66 29.07	1 0.44	7 3.08	3 1.32	227 100.00

STATISTICS FOR TABLE OF GROUP BY AGE

Statistic	DF	Value	Prob
Chi-Square	10	14.052	0.171
Likelihood Ratio Chi-Square	10	15.865	0.104
Mantel-Haenszel Chi-Square	1	1.299	0.254
Phi Coefficient		0.249	
Contingency Coefficient		0.241	
Cramer's V		0.249	

Sample Size = 227
WARNING: 68% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 9

TABLE OF GROUP BY TYPEBUS

GROUP TYPEBUS

Frequency Expected Percent Row Pct Col Pct	C	Oth	Othadv	Othemstt	Total
NONR	21 15.722 9.25 48.84 25.30	12 12.502 5.29 27.91 18.18	1 4.1674 0.44 2.33 4.55	9 10.608 3.96 20.93 16.07	43 18.94
RESP	62 67.278 27.31 33.70 74.70	54 53.498 23.79 29.35 81.82	21 17.833 9.25 11.41 95.45	47 45.392 20.70 25.54 83.93	184 81.06
Total	83 36.56	66 29.07	22 9.69	56 24.67	227 100.00

STATISTICS FOR TABLE OF GROUP BY TYPEBUS

Statistic	DF	Value	Prob
Chi-Square	3	5.481	0.140
Likelihood Ratio Chi-Square	3	6.377	0.095
Mantel-Haenszel Chi-Square	1	2.777	0.096
Phi Coefficient		0.155	
Contingency Coefficient		0.154	
Cramer's V		0.155	

Sample Size = 227

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 10

TABLE OF GROUP BY SIZE

GROUP SIZE

Frequency Expected Percent Row Pct Col Pct	Over 300	100-199	200-299	200-300	40-49	50-59	50-99	60+	Total
NONR	7 7.3877 3.08 16.28 17.95	12 8.7137 5.29 27.91 26.09	6 5.4934 2.64 13.95 20.69	0 0.5683 0.00 0.00 0.00	1 0.1894 0.44 2.33 100.00	0 0.5683 0.00 0.00 0.00	16 19.89 7.05 37.21 15.24	1 0.1894 0.44 2.33 100.00	43 18.94
RESP	32 31.612 14.10 17.39 82.05	34 37.286 14.98 18.48 73.91	23 23.507 10.13 12.50 79.31	3 2.4317 1.32 1.63 100.00	0 0.8106 0.00 0.00 0.00	3 2.4317 1.32 1.63 100.00	89 85.11 39.21 48.37 84.76	0 0.8106 0.00 0.00 0.00	184 81.06
Total	39 17.18	46 20.26	29 12.78	3 1.32	1 0.44	3 1.32	105 46.26	1 0.44	227 100.00

STATISTICS FOR TABLE OF GROUP BY SIZE

Statistic	DF	Value	Prob
Chi-Square	7	12.511	0.085
Likelihood Ratio Chi-Square	7	11.654	0.113
Mantel-Haenszel Chi-Square	1	0.928	0.335
Phi Coefficient		0.235	
Contingency Coefficient		0.229	
Cramer's V		0.235	

Sample Size = 227
WARNING: 50% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 11

TABLE OF GROUP BY SEX

GROUP	SEX		
Frequency Expected Percent Row Pct Col Pct	f	m	Total
NONR	23 18.185 10.13 53.49 23.96	20 24.815 8.81 46.51 15.27	43 18.94
RESP	73 77.815 32.16 39.67 76.04	111 106.19 48.90 60.33 84.73	184 81.06
Total	96 42.29	131 57.71	227 100.00

STATISTICS FOR TABLE OF GROUP BY SEX

Statistic	DF	Value	Prob
Chi-Square	1	2.725	0.099
Likelihood Ratio Chi-Square	1	2.696	0.101
Continuity Adj. Chi-Square	1	2.189	0.139
Mantel-Haenszel Chi-Square	1	2.713	0.100
Fisher's Exact Test (Left)			0.965
(Right)			0.070
(2-Tail)			0.123
Phi Coefficient		0.110	
Contingency Coefficient		0.109	
Cramer's V		0.110	

Sample Size = 227

RESPONDENTS AND NON-RESPONDENTS 11:53 Wednesday, July 22, 1992 12

TABLE OF GROUP BY EDUC

GROUP EDUC

Frequency Expected Percent Row Pct Col Pct	a	b	d	e	hs	m	Total
NONR	5 6.8194 2.20 11.63 13.89	25 19.7 11.01 58.14 24.04	1 0.7577 0.44 2.33 25.00	0 0.3789 0.00 0.00 0.00	3 7.3877 1.32 6.98 7.69	9 7.9559 3.96 20.93 21.43	43 18.94
RESP	31 29.181 13.66 16.85 86.11	79 84.3 34.80 42.93 75.96	3 3.2423 1.32 1.63 75.00	2 1.6211 0.88 1.09 100.00	36 31.612 15.86 19.57 92.31	33 34.044 14.54 17.93 78.57	184 81.06
Total	36 15.86	104 45.81	4 1.76	2 0.88	39 17.18	42 18.50	227 100.00

STATISTICS FOR TABLE OF GROUP BY EDUC

Statistic	DF	Value	Prob
Chi-Square	5	6.305	0.278
Likelihood Ratio Chi-Square	5	7.343	0.196
Mantel-Haenszel Chi-Square	1	0.491	0.484
Phi Coefficient		0.167	
Contingency Coefficient		0.164	
Cramer's V		0.167	

Sample Size = 227
WARNING: 33% of the cells have expected counts less than 5. Chi-Square may not be a valid test.

VITA 2

Richard P. Herrmann

Candidate for the Degree of

Doctor of Education

Thesis: A COMPARISON OF THE PERCEPTIONS THAT DIFFERENT LEVELS OF MANAGEMENT IN THE BUSINESS SERVICES AREA HAVE CONCERNING SCANS COMPETENCIES AND FOUNDATION

Major Field: Occupational and Adult Education

Biographical:

Personal Data: Born in Toledo, Ohio, March 29, 1947, the son of Kurt and Geraldine Herrmann; married to Shelby Herrmann, June 21, 1990.

Education: Graduated from Santa Clara High School, Santa Clara, California in June, 1965; received Bachelor of Arts degree from San Jose State University, San Jose, California in June, 1970; received Master of Business Administration degree from San Jose State University, San Jose, California in May, 1976; completed requirements for the Doctor of Education degree at Oklahoma State University in May, 1993.

Professional Experience: Business Education Instructor, Modesto, California, 1971-1983; Executive Director, California Association of DECA, Sacramento, California, 1983-1988; Resource Teacher, Modesto, California, 1988-1992; Vocational Education Administrator, Modesto, California, 1992-1993. Additional concurrent experience includes: college professor, Pomona, California; owner, Designer Glass by SGO; college instructor, Modesto, California; and consultant, State of California.