An analysis of vocational training in the field of technology at the community college level relative to meeting the needs of business and industry

Amanda Chang

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AN ANALYSIS OF VOCATIONAL TRAINING IN THE FIELD OF TECHNOLOGY
AT THE COMMUNITY COLLEGE LEVEL RELATIVE TO
MEETING THE NEEDS OF BUSINESS AND INDUSTRY

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education

by
Amanda Chang
December 1995
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Approved by:

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11/23/95 Date
Abstract

Computers were introduced to the business world in the 1950s. Since that time they have changed the way we live, and the way business is conducted. Computers and other types of technology that have been introduced within the last decade have changed the way in which people work. The work force today needs to be trained with special skills in order to meet the needs of business and industry. This has forced community colleges to play a greater role in preparing young men and women for the work place.

The purpose of this study was to identify the computer and technical courses currently being offered at five Southern California community colleges. A questionnarie was prepared for teachers, staff, and students within the colleges. A total of forty questionnaires were used for this research. Secondary research was also conducted regarding the importance of community colleges today.

The findings of the study supported the view that community colleges need to play a larger role in educating young people today. They can prepare young people to meet the needs of the labor force and significantly reduce the number of those unemployable. The colleges cannot do it alone, however. They need support and cooperation from business and industry, as well as the state and federal governments.
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CHAPTER I

INTRODUCTION

BACKGROUND

The use of computers began in the 1950s with the introduction of the
Electronic Numerical Integrator and Computer (ENIAC), a massive machine that
would change the world (Madnick and Donovan, 1974). Since that time,
computers have been made smaller, with greater capabilities, and at less cost.
As a result, they have found their place in almost every office, industry, and
home. They have changed the concept of the workplace, and the way in which
work is performed. In addition, they have promoted the development of
additional technology such as robots, communication systems, ATM machines,
to name a few.

Computer improvements have also affected the type of skills needed in
the workplace today. Computers and their accessories have created different
types of jobs needed in the workplace. Concurrently, they require maintenance,
repair and programs to operate. The majority of these skills do not need a four
year college degree. The Educational Testing Service (ETS) reports that
workers trained with these skills are the ones who get the most jobs in business
and industry. However, half of the nation's front line workers have received
neither work preparation nor work force training. At the same time, there are
many young people looking for work without skills to perform any of these tasks
(Boggs, 1993).
According to Boggs (1993) "The country must do more to invest in its future by educating its work force" (p. 4). Community colleges, he concluded, are in a good position to provide the needed preparation and training since they are the major source of "cost effective career preparation and have the ability to deliver needed technical training for business of all sizes" (p. 4).

**NATURE OF THE PROBLEM**

Many young people do not choose to go to college. Others are not able to go to college, either because of finances, or grade achievement. As a result, many need to develop skills which will allow them to find jobs in order to be productive, and not become a burden on society. If students are able to acquire skills in community college, they will have more of an incentive to obtain skills needed to meet the needs of the workplace.

The problem is significant in that young people need to be trained in skills that they can sell in the labor market. Concurrently, employers need people skilled in the use of technology. Most employers choose not to provide time or facilities to set up training. Many depend on public and private educational systems to train men and women with technological skills they need for today and tomorrow’s jobs. Without skilled workers, employers are at a major disadvantage in the increasingly competitive marketplace.

Boggs (1993) writing about the significance of the problem, noted that technological advances are changing the way Americans live and conduct business. Despite America's creativity, other countries are out competing in
turning our inventions to economic advantage. As a result, our global competitiveness is being lost because we have neglected our nation’s work force. Unless corrective action is taken, he states: "We will doom our people to an unprecedented low standard of living and an insecure future" (p. 4). The situation is critical as the nation cannot wait for an education reform movement to solve the problem of underdeveloped employee skills.

STATEMENT OF THE PROBLEM

Last year, Congress recognized the role that community colleges must play in providing young people with the technical training they need to meet the needs of business and industry. Boggs (1993) indicated the Scientific and Advanced Technology Act of 1992 stated, "Improvement of work force productivity and our international economic position depend upon the strengthening of our educational efforts in science, math, and technology, especially at the associate degree level" (p. 4).

Following the election of Clinton, support for the vocational education was reinforced by the introduction of the School-to-Work Opportunities Act in 1993. This legislation promised up to $300 million in funding for education programs that give all students better access to post secondary education and to good jobs after high school (Hudelson, 1994).

These reports indicate that increasing responsibility is being placed on community colleges to prepare young people to meet the needs of business and industry. These colleges are viewed as the best alternative to those provided by
a few large companies, and the large numbers of jobs needing to be filled.
Training at the community college level should also enable large numbers of young people to find meaningful employment and not remain among the numbers of the unemployed.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the types of training programs involving technology that are currently being offered at community colleges that are designed to provide students skills to meet the needs of business and industry today. A study of the courses being offered at five selected Southern California community colleges will be reviewed. The five schools were selected at random, based on their geographic location.

RESEARCH QUESTIONS

The research is designed to answer the following questions:

1. What programs are available for students to achieve computer related skills in the community college?
2. What training programs are being offered?
3. What types of programs are being offered that are technical in nature, e.g., maintenance, repair and service of computers?
4. What is the relationship of skills to actual job/work?
5. How are vocational programs selected?
6. Is there a close working relationship between the college and business and industry?
METHODOLOGY

The methodology selected for this study consists of both primary and secondary research. Primary research consists of a questionnaire that will be prepared to conduct personal interviews with the faculty and staff of community colleges in the area relative to vocational training programs as follows:

- Rio Hondo College
- Mount San Antonio College
- Citrus College
- Fullerton Community College
- Chaffey College

The objective of the interviews is to determine what vocational programs are being offered in technology related fields and their effectiveness to meet needs of business and industry.

Secondary research consists of magazine and journal articles regarding vocational training focusing on technology. The purpose of the secondary material is for identification and/or analysis to support the need for special training programs built around technology.

LIMITATIONS

The study is limited to the subject of vocational training that focuses on technology, and involves five selected Southern California community colleges.
DEFINITIONS

Technology for the purpose of this study is limited to electronic equipment being used in the workplace today. It includes, but not limited to, computers and related equipment (computerized systems).
CHAPTER II
REVIEW OF LITERATURE

HISTORICAL REVIEW

The roots of vocational education reach deep into the historical past. According to Barlow (1991) the mores of every culture leaving a written record have included evidence that trade education in ancient nations was conducted in a father-son relationship. It was not until the advent of apprenticeship that we find distinctive patterns of teaching industrial processes. This was the first vocational education that was made part of training of youth to work in the trades.

Apprenticeship was practiced throughout colonial America. There were two kinds: to learn a trade and involuntary apprenticeship. The apprenticeship provided a means of taking care of poor children and orphans. In general, apprenticeship agreements provided for food, clothing, and shelter, religious training; general education as needed in the trade; knowledge, understanding, and experience in the trade skills; and, finally, for the mysteries of the trade, or the techniques which had some elementary scientific basis. It was mostly boys that came from poor families that found opportunities in apprenticeship (Barlow, 1991).

The awakening of educational consciousness in the United States occurred about 1820 in the United States. General enthusiasm for public schools was slow to develop, but over the next fifty years the idea of the common school became woven into the fabric of the American culture. By 1870, the American
people had accepted the concept of universal public elementary education, and progress in that direction tended generally to be satisfactory. Beginning with Massachusetts in 1851, state after state enacted school laws requiring the attendance of youth through the eight grade. This was the spirit of democracy at work — providing free education for all (Barlow, 1991).

Within a short time it became obvious that "book learning" was not enough to prepare young men and women for work. Many held the view that education was suppose to be like the life to which students were being prepared. These attitudes promoted the passage of the Morrill Act by Congress in 1862 which provided for the establishment of agricultural and mechanical colleges. Although the Morrill Act was related to college level programs, many discussions and opinions expressed would have future value to other levels and kinds of industrial education (Barlow, 1991).

Differences between skilled labor and educated labor were largely differences of the degree and kind of education. The skills taught were to relate to genuine work and students were not involved in any other activity. At the time there was great need for industrial training because by this time, the nation was industrializing, and the apprenticeship system had declined (Barlow, 1991).

The first training school was opened in St. Louis in 1855 when the trustees of Washington University established the O'Fallon Polytechnic Institute. Calvin Woodward, principal of the school, frequently attended professional association meetings. Members saw the benefit of manual training and offered financial
assistance for implementing the program in the secondary school. The success of the program motivated other universities to also get involved. Educated labor as opposed to "skilled labor" gained acceptance. As industrialization continued, employers began to support some form of industrial education. By the turn of the century, it was common knowledge that there was a need for trained mechanics for which young people needed to be trained in order to be prepared to enter the labor force. However, there were no attempts to turn the high school into a trade training program. As time passed and the needs became critical, industrial education began to develop on many fronts (Barlow, 1991).

Gray (1991) reported that vocational education developed from a consensus that solidified during the 20 years that spanned the turn of the century. As they are today, the schools were criticized for placing the nation in jeopardy. In particular, it was suggested that the single high school curriculum, the classical curriculum, served but a few while providing nothing of value for the majority. At that time there were those who argued for vocational training for young people, particularly those in the middle class. However, from the beginning, upwardly mobile parents were never persuaded that vocational education was the route to the American dream for their children. Even today there are those who view vocational education as a plot hatched by the empowered elite to perpetuate the subservient status of the working class.

As a result, vocational education reflected a cultural bias against those who performed nonprofessional (manual) work, because this prepared young
men and women for second class occupations. This image has persisted and is perhaps the root of vocational educational problems today. The most damaging effect has been that until recently, educators have kept "hands off" of vocational programs in the high schools as well as community colleges (Gray, 1991).

Vocational education experienced unprecedented growth in the 1960s and 1970s. Enrollment peaked between 1963 and 1984 when the federal government financially aided the schools. Construction of new facilities increased due to state funding in many states. Vocational education entered the 1980s riding high. Programs were filled to capacity. Students were being turned away in many places. Around 1984, however, things changed again. Studies conducted in reparation of the reauthorization of the Perkins Act led Congress to conclude that vocational education was in trouble and its future was threatened as enrollments continued to decline. A contributing factor was the decline in high school graduates and there are several reasons for this. In most states, high school graduation requirements were increased. This has been viewed as the most significant factor in declining enrollments. Students have problems meeting the demands of the school and taking vocational courses in addition. Those that graduated were encouraged to go on to higher education, with vocational education programs still being viewed as second rate educations (Gray, 1991).

Today, there is a renewed interest in vocational education as the nation faces shortages of technical workers. One of the national goals for education by the year 2000 is that every adult American will be literate and will possess skills
necessary to compete in the global economy. Most educators have accepted the
act that the public school has a duty to teach skills that promote excellence in the
workplace, but not all do so enthusiastically. With greater emphasis being
placed on disadvantaged young people, those in minority groups and those who
may be handicapped, a different look is being given at the benefits of vocational
training. This look is from two different perspectives — preparing disadvantaged
young people for the workplace, and providing labor needed in business and
industry (Gray, 1991). In many cities throughout the nation, the community
college, a two year program to earn an associates in arts degree, has undertaken
the task of providing young people with certain technical skills to enter the
workforce.

Silberman (1991) stated, “Vocational curriculum has undergone raid
change in many states” (p. 30). Vocational teachers added academic content
and ask their students to do more reading, writing, math and science. New
technology programs are replacing the industrial arts, electric and metal shops, in
some middle schools. Tech prep agreement have been developed to link high
school and community college programs. The corporate sector has become a
more active partner in the occupational preparation of students. Some firms
encourage their employees to teach technology topics in adopted schools and
offer expended opportunities for student work experience. Business and labor
groups also have been more active in specifying for educators the knowledge,
skills and personal attributes that are needed in the workplace. They are placing
more emphasis on the work ethic, and on entrepreneurship than on specific job skills.

THE CHANGING WORKPLACE

Buzzell (1991) stated The Wall Street Journal recently reported on the impact of technological advancements in the workplace, indicating that for years, computers were not used effectively by business. They were merely adapted to old work methods, such as replacing a typewriter with a computer. Now, more and more companies are learning to use computer networks to cut out work altogether instead of simply doing it faster. Similarly, companies have replaced front office personnel with voice mail and pages. AT&T, for example, uses computer based automation to cut the long distance operators from 44,000 to 15,000 in the past decade. Automated teller machines and bank by phone computers have enabled banks to slash ranks of tellers to 301,000 last year from 480,000 in 1983.

On the other side of the coin, it was recently reported that United Parcel Service now has 3,000 information technology employees, up from 90 in 1983. At many companies, more technicians will be needed to service computer networks, and more programmers to write software. Changes are taking place in the workplace in many different fields including: health occupations, marketing, business education, trade and industry. What this means is that young people today need to be prepared for a totally different workplace compared to that which their parents prepared for.
Buzzell (1992) writes that some traditional careers are changing, and there are jobs looking for skilled workers that offer long term employment at good pay, even without a four year college degree. He provides the following examples:

- Truck drivers today, with the aid of a computer and modem, delivers packages when the customer needs them and helps assemble the complex machinery he delivers. The truck driver today is a technician, and he is earning a good salary.

- Sales people in a department store advise customers about new products, ordering merchandise, managing a specific area of expertise, and earning a good living.

- The factory worker sits at a computer, programming and reprogramming a robot to do the pulling and twisting that humans once did. He earns a good income.

- The person in the same factory who maintains and repairs computers, continually upgrading them and linking them together in ever more efficient ways, earns a good living.

A recent survey by the National Occupational Information Coordinating Committee and the National Career Development Association revealed that Americans believe high schools are not doing enough to help students develop jobs skills, find jobs and plan careers. At the same time, the business
community is asking education to equip entry workers with skills that permit them to perform upon arrival on the job. This means that schools need to bring programs in line with the real labor market demand. Buzzell emphasize: "Educational institutions must respond urgently to the new realities of the American economy or our economy will not remain competitive for long" (p. 8).

Boggs (1993) indicated that government leaders are beginning to understand that a skilled and adaptable work force is necessary for the economic prosperity of our communities, states, and nation. Work force preparation and training need to be part of a comprehensive national investment policy. Community colleges have a proud history of meeting America's needs for education, training and socialization. Now, community college leaders, business and industry executives, and government officials must work cooperatively to develop a coherent system for improving the skills of the work force. It is the best hope to restore economic prosperity for all.

Richman (1994) reported that a new worker elite is transforming the American labor force and potentially every organization employing them. The growth in the number of technicians and the diversity of occupations they hold reflect a profound change in their importance to companies that hope to survive and thrive in an era of change. Since 1950, the number of technical workers has increased nearly 300 percent — triple the growth rate for the work force as a whole, to some 20 million. With one out of every four new jobs going to a technical worker, the Bureau of Labor Statistics forecasts that this army of
techno-competents, already the largest board occupational category in the United States, will represent a fifth of total employment within a decade. (See Table II-1).

The convergence of two large forces are giving technicians new importance. First, increasingly powerful, versatile, and user friendly new technologies, from the software that electronics technicians use to test printed circuit boards to protein analyzers, are eliminating the need for workers to perform many time consuming routine tasks. Thus, they are freed to tackle more challenging activities that require judgment and skills. Second, as more companies rely on technology to help eliminate quality defects, speed up product development, and improve customer service, technicians become the

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<td>$26,312</td>
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<td>Science Technicians</td>
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Technicians bring varying levels of formal education and credentials to their work. Many enter technical fields with no more than a high school diploma and training acquired on the job. Since smaller armed forces of today no longer turn out technicians in the numbers they did during the Cold War years, more aspiring technical workers are coming to these careers from a trade school or a community college (Richman, 1994).

Some organizations are starting to make the mastery of a technical specialty the prerequisite for career growth. Richman (1994) is an example from Union Pacific, which reported that all new employees who aspire to a management position must first become a "data integrity analyst." The reason is that management has determined that the company's future growth depends on managers to be masters of technical data rather than overseers of the hourly workers.

Those entering the technical field appear to have an excellent future. According to Richman (1994) the new power of the technical work force is providing companies with the knowhow to alter their destiny, to make competitive leaps, to break into new markets, and to offer employees wide horizons and far more opportunity than any generation of workers has encountered before.

WORKING TOWARD SOLUTIONS

For decades, the American education system has been greatly criticized for the way in which young men and women are "not" being prepared to meet the
adult world and participate in it following graduation from high school. Today, many feel that the schools are not keeping in touch with the needs of business and industry. The result is that young people represent a significant percentage of the unemployment rate. At the same time, there has been an increase in juvenile crime, believed to be the result of young people not being equipped to enter adulthood, and therefore find other ways to occupy their time. Some education systems are taking steps to bring about change. Some of these changes could be used as a model for implementation in other communities.

Daggett (1994) noted that in many districts, vocational teachers are leading the technological invasion in the hope of preparing students for the computerized, information based, world in which they will live and work. However, as the waves of technological change break faster and faster, the technologies being taught today may be outdated by the time students graduate. Dagget emphasizes the fact that what is needed is a curriculum that stresses academics in order to adequately prepare students for their work world of technology. Greater importance needs to be placed on applied math, science, language arts skills, and knowledge of the world beyond school. While these programs have gained momentum in this country, they are still far outdistanced by the European and Asian education systems.

Jackson (1993) reported on the progress Fayetteville Technical Community College, North Carolina, has made in preparing young people for the future. In 1990, the Cumberland County School System administration, and
representatives from the eight county high schools collaborated in developing a countywide tech program. To strengthen the program, a partnership was created with the high school, community college, business and industry, and the community. The goal was to identify common needs and strategies to prepare students for additional technical training and direct entry into the workforce. The relationship with business and industry was viewed as being vital to the program so that the needs of both the students and the workplace could be met. The students were trained to enter the workplace, and business managers had the manpower available when they needed it.

THE COMMUNITY COLLEGE

Seidman (1993), remarked that the mission and philosophy of community colleges differ from a four year institution. It is estimated that some six million students are enrolled. The task of the community college is to teach students a skill that they can use for a lifetime. It is the community college that offers students an opportunity to succeed in life even though they may have had a poor educational background that would prevent them from being accepted by a four year college. It is important, therefore, that the community colleges develop programs to assist students to achieve their maximum potential.

Bigelow (1993), indicated that many community colleges are refocusing on distance learning, lifelong learning, and other concepts that break the traditional patterns of student-teacher interaction. The objective is to make education more available to those who may be employee during the day. He encourages
community colleges to network with business and industry, which is viewed as becoming an important community college mission. Work study programs, company sponsored education programs, commercial training seminars, and industry sponsored research and development are greatly enhanced by computer links between colleges and business.

Cantor (1991) stressed the importance of business people becoming involved with the community college. Business people say they want to work with colleges interested in work based services, such as customized training of employees. But many community colleges do not take the time to size up a firm's true needs and instead simply offer canned courses, which are too generic. Whether at the college or job site, instructors must show how theory is applicable to specific equipment and methods of that business.

Cantor (1991) proposed that the major stumbling block is that community college leaders do not view apprenticeship as a legitimate educational factor in associate degree programs. They fail to realize that apprenticeship can help mitigate internal financial problems for the colleges by increasing enrollment through the sharing of costly equipment and facilities with business. He continues stating that cooperation between the community college and business benefits both. This can be achieved through apprenticeship programs. The idea is not a fad. Apprenticeship has survived the ages because it is a powerful training process, and has enormous potential to bring together workers, business and schools for the good of all.
According to Marcus (1993) President Clinton took time out from working on health care and other matters to promote another administrative initiative: job training programs for high school students. He traveled to Sussex County where a program called "Operation Skyway" helps students train for aviation careers. The trip was meant to highlight a measure introduced that would provide federal funding for school to work programs to prepare noncollege bound youth for the job market.

Clinton stated:

Operation Skyway is an example of what America has to do to adapt to change. We can no longer afford to be the only advanced nation in the world without a system for providing this kind of training and education to everybody who does not go on and get a four year college degree (Marcus, 1993, p. A4).

According to federal figures, 50 percent of high school graduates do not go on to college, and 75 percent do not earn a college degree. These figures influenced the passage of the School-to-Work Opportunities Act of 1994 which provides money to states and communities to develop and implement training programs and establish national standards for such program (Marcus, A4).

Hudelson (1994) reported that the average American high school today, students prepare for college or work on one of two tracks, college prep (47 percent) or vocational education (12 percent). The remaining 41 percent are
headed nowhere certain on the broad "general education" track. The "School-to-
Work Opportunities Act of 1994," was passed for the purpose of bringing about
change to these statistics. Its goal is to give every student the opportunity to sign
up for a program that provides a clear pathway to a career. The law is designed
to help states create school-to-work transition systems that replace the traditional
tracks.

Hudelson (1994) reported that the President signed the Act in May, 1994. The Act provided for $300 million for 1995. However, the Senate voted $280
million. It is likely that a conference committee will split the difference and
appropriate $240 million for grants to help states and local education agencies to
get school-to-work programs off the ground. Congress has already approved
$100 million for 1994 for the first rounds of planning and implementation grants.

The legislation also requires that projects integrate work based and school
based learning and academic and vocational learning. All students are to be
provided with opportunities to complete a career major. The program gives
students a clear understanding of the industry they are preparing to enter,
including appropriate work experience. The success of the program depends
entirely on the cooperation of business people to open training slots for students.

CONCLUSION

There is strong evidence that the world of work is changing rapidly. These
changes are affecting the way we live and earn a living. Although technical
training has been viewed in the past as providing a secondary education, it must
be acknowledged that all students cannot attend a four year college. Technical schools and community colleges must play a larger role in preparing young people for the jobs that need to be filled by business and industry. Without technical training many more young people will be unemployed, and business and industry will not have the labor force needed to meet the increased global competition in the marketplace.

Community colleges need to work closely with business and industry for two reasons: to ensure that the college prepares young people that business and industry can draw their labor pool from, and also receive leadership and financial assistance from business so the needed technical training will be provided. Federal programs have been introduced to assist high schools and community colleges to offer technical training that is required in the workplace today. What is needed is for the community, business, industry, states and the federal government to work as a team. Vocational training is the only answer to not only the education problems today, but also the lack of skilled or "educated labor." As a team, these institutions can make a significant contribution to the future of the country.
CHAPTER III
METHODOLOGY

PURPOSE OF THE STUDY

The purpose of this study is to investigate the types of training programs involving technology currently being offered at selected community colleges in Southern California that are designed to provide students skills to meet the needs of business and industry today. Primary data were collected by surveying educators at five community colleges. Secondary data were collected from published articles found in journals, magazines, books, and newspapers. This research is shown in Chapter II, Review of Literature.

INSTRUMENT

Ten copies of a four page questionnaire and a letter of introduction were delivered to the five selected Southern California community colleges for the purpose of answering the research questions. A copy of the questionnaire and letter are shown in Appendix I.

The questionnaire was divided as to:

- Programs currently being offered,
- Support programs offered,
- Technical training programs available,
- Relationship of skills acquired to actual work, and
- Twenty statements requesting respondent's opinions as to various aspects of vocational training.
A total of 40 questionnaires were returned to the researcher. All of the questionnaires returned have been included in the research analysis.

**SURVEY TECHNIQUE**

The questionnaires, along with a letter of introduction, were delivered to five selected Southern California community colleges. These included:

- Rio Hondo College,
- Mount San Antonio College,
- Citrus College,
- Fullerton Community College, and
- Chaffey College.

The respondents were randomly selected by the community college staff. Respondents included staff, teachers, counselors and students. The random sample respondents are viewed as reflecting the total staff, teacher, and counselor population of the community college.

The respondents were asked to determine on a Likert scale ranging from Strongly Agree to Strongly Disagree their opinion regarding the statements on the questionnaire. The responses were combined and analyzed using a random variable based on the number responding to arrive at the probability that such responses represent the true population. The result of the equation identified the standard deviation and variances of the responses. The findings are shown in Chapter IV.
CHAPTER IV

FINDINGS

The findings of the questionnaire are noted in this chapter. The questionnaire is divided into two sections. The first section is general information. The data reflected the types of computer programs now available at the college, programs offered to support these programs, the technical training programs now available, and the relationships of skills acquired to actual jobs.

GENERAL INFORMATION

The purpose of this section was to identify the types of vocational programs currently available at the community college. The current programs are defined as those offered to students that will prepare them to enter the workplace.

A. Computer programs:

The majority of respondents indicated that the primary programs being offered were: general use, programming, and accounting. All the colleges offered courses in the general use of the computer only.

There was an absence of programs concerning hardware. Some courses offered courses in enhancements such as the addition of components to upgrade a system, modems for online training, and the like. No courses were offered as to the technical side of the computer defined as repairing and/or building computers.
B. Support Programs:

The respondents indicated that other programs were offered to support the vocational programs including:

Mathematics
Reading, writing
Engineering
Drafting
Graphics design

However, all of these courses were not offered by all the colleges. Mathematics, reading and writing were universal. Some colleges offered courses in CADD Technician, Architecture, and Engineering Assistant. These courses were offered at Rio Hondo College, but not at the others.

C. Technical Training

The questionnaire defined technical training programs as skills in auto mechanics, television, VCR repair, home appliance repair, plumbing and electrical. The majority of respondents indicated that the only technical training provide by the college was for auto mechanics.

D. Relationship of skills acquired to actual work.

The purpose of this question was to identify the level of skills that the student would achieve upon completion of the course. The majority of respondents indicated that the skills would qualify the student only for entrance level or apprenticeship positions. In many cases more training on the job would
be required. However, respondents indicated that jobs are made available to students once their training at the college has been completed.

Research Questions:

The questionnaires answered the questions as to what programs are currently available in community colleges, the training and technical programs being offered.

STATEMENTS

Respondents were asked to indicate their opinion regarding the following statements on a scale ranging from strongly agree (5), agree (4), no opinion (3), disagree (2), or strongly disagree (1). The responses of each questionnaire was combined with all the questionnaires, and each variable analyzed against the number responding to arrive at the probability. From this analysis the standard deviation and variance were revealed. The following equation was used:

\[ E(X) = \text{Exp}(X) = X_1 p(X_1) + X_2 p(X_2)...X_n p(X_n) \]

\[ = 5(\text{Result}) + 4(\text{Result}) + 3(\text{Result}) + 2(\text{Result}) + 1(\text{Result}) = \]

\[ \text{Result} \]

\[ \text{Standard Deviation: } \sqrt{\text{Variance}} = \]

The analysis of the 40 questionnaires, the random variable, number responding, probability, and standard deviation are identified for each question in the following tables:
QUESTION NO. 1. Vocational programs are selected based on needs of business and industry:

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>11</td>
<td>0.275</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>25</td>
<td>0.625</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>2</td>
<td>0.05</td>
</tr>
</tbody>
</table>

E(X) = 4.075
Standard Deviation: $\sqrt{0.76908} = 0.87698$

The responses indicated that the majority of respondents agreed or strongly agreed that vocational program should be selected based on needs of business and industry.
QUESTION NO. 2. Vocational programs are state mandated:

TABLE IV - 2

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>5</td>
<td>0.125</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>8</td>
<td>0.02</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>10</td>
<td>0.25</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1</td>
<td>0.025</td>
</tr>
</tbody>
</table>

E(X) = 2.81

Standard Deviation: $\sqrt{1.41306} = 1.1887239$

The responses indicated that the majority of respondents agreed or strongly agreed that vocational programs were state mandated. However, the responses indicated that a number of respondents disagreed and had no opinion.
QUESTION NO. 3. Vocational programs are determined by the School Board/Committee, etc.

TABLE IV - 3

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>19</td>
<td>0.475</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>10</td>
<td>0.25</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>6</td>
<td>0.15</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1</td>
<td>0.025</td>
</tr>
</tbody>
</table>

E(X) = 3.475  
Standard Deviation: \( \sqrt{0.8993616} = 0.94835 \)

The responses indicated that the majority of respondents agreed or strongly agreed that vocational programs are determined by the School Board/Committee, etc. One fourth of the respondents had no opinion, followed by only seen that disagreed.
QUESTION NO. 4. There is a close working relationship between the college, business and industry.

**TABLE IV - 4**

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>10</td>
<td>0.25</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>12</td>
<td>0.525</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>3</td>
<td>0.075</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>5</td>
<td>0.012</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1</td>
<td>0.025</td>
</tr>
</tbody>
</table>

\[
E(X) = 3.85
\]

\[
\text{Standard Deviation: } \sqrt{1.0275} = 1.013657
\]

The responses indicated that the majority of respondents agreed or strongly agreed that there is a close working relationship between the college, business and industry.
QUESTION NO. 5. Business and industry help to identify their needs and develop vocational programs for such needs.

TABLE IV - 5

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>8</td>
<td>0.2</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>25</td>
<td>0.625</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>3</td>
<td>0.075</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 3.95

Standard Deviation: $\sqrt{0.5495} = 0.741282$

The responses indicated that the majority of respondents agreed or strongly agreed that business and industry help to identify their needs and develop vocational programs for such needs.
QUESTION NO. 6. There should be a closer working relationship between college, business and industry.

TABLE IV - 6

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>23</td>
<td>0.575</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>15</td>
<td>0.375</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>1</td>
<td>0.025</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1</td>
<td>0.025</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 4.5

Standard Deviation: \( \sqrt{0.45} = 0.6708204 \)

The responses indicated that the majority of respondents agreed or strongly agreed there should be a closer working relationship between college, business and industry.
QUESTION NO. 7. Business and industry should provide teachers/instructors in college classes.

TABLE IV - 7

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>8</td>
<td>0.175</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>16</td>
<td>0.5</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>7</td>
<td>0.225</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>8</td>
<td>0.1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1</td>
<td>0.0</td>
</tr>
</tbody>
</table>

E(X) = 3.55

Standard Deviation: \( \sqrt{1.974955} = 1.0943014 \)

The responses indicated that the majority of respondents agreed or strongly agreed that business and industry should provide teachers/instructors in college classes.
QUESTION NO. 8. Employers should provide lecturers for the college vocational courses.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>7</td>
<td>0.175</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>9</td>
<td>0.225</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 3.75

Standard Deviation: $\sqrt{0.8734375} = 0.9345788$

The responses indicated that the majority of respondents agreed or strongly agreed that employers should provide lecturers for the college vocational courses.
QUESTION NO. 9. Business and industry contribute money, equipment, tools, etc., to the college.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>12</td>
<td>0.3</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>15</td>
<td>0.375</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>8</td>
<td>0.2</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>3</td>
<td>0.075</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>2</td>
<td>0.05</td>
</tr>
</tbody>
</table>

E(X) = 3.8

Standard Deviation: \( \sqrt{0.958} = 0.978775 \)

The responses indicated that the majority of respondents agreed or strongly agreed that business and industry contribute money, equipment, tools, etc., to the college.
QUESTION NO. 10. Business and industry open doors to students for field trips.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>17</td>
<td>0.425</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>6</td>
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</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1</td>
<td>0.025</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

E(X) = 4.2

Standard Deviation: \( \sqrt{0.61} = 0.781025 \)

The responses indicated that the majority of respondents agreed or strongly agreed that business and industry open doors to students for field trips.
QUESTION NO. 11. Vocational education should play a greater role in education due to the introduction of new technology.

TABLE IV - 11

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>25</td>
<td>0.625</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>13</td>
<td>0.325</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

E(X) = 4.575
Standard Deviation: $\sqrt{0.344375} = 0.5868340$

The responses indicated that the majority of respondents agreed or strongly agreed that vocational education should play a greater role in education due to the introduction of new technology.
QUESTION NO. 12. Vocational training in high schools is not sufficient to prepare young people to enter the workforce.

TABLE IV - 12

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>16</td>
<td>0.4</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>7</td>
<td>0.175</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1</td>
<td>0.025</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 4.175

Standard Deviation: \(\sqrt{0.644375} = 0.8027297\)

The responses indicated that the majority of respondents agreed or strongly agreed that vocational training in high schools is not sufficient to prepare young people to enter the workforce.
QUESTION NO. 13. Need for vocational training will be greater in the next ten years.

TABLE IV - 13

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>25</td>
<td>0.625</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>12</td>
<td>0.3</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>3</td>
<td>0.075</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 4.55

Standard Deviation: \( \sqrt{0.24} = 0.4898979 \)

The responses indicated that the majority of respondents agreed or strongly agreed that need for vocational training will be greater in the next ten years.
QUESTION NO. 14. The community college should play a greater role in the community to meet the needs of the community.

TABLE IV - 14

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>24</td>
<td>0.6</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>13</td>
<td>0.325</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

E(X) = 4.5

Standard Deviation: \( \sqrt{0.5} = 0.7071068 \)

The responses indicated that the majority of respondents agreed or strongly agreed the community college should play a greater role in the community to meet the needs of the community.
QUESTION NO. 15. More state/federal funds should be made available to community colleges to support needed programs.

TABLE IV - 15

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
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<td>27</td>
<td>0.675</td>
</tr>
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<td>Agree</td>
<td>4</td>
<td>11</td>
<td>0.275</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>2</td>
<td>0.05</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 4.625

Standard Deviation: \( \sqrt{0.334375} = 0.5782517 \)

The responses indicated that the majority of respondents agreed or strongly agreed more state/federal funds should be made available to community colleges to support needed programs.
QUESTION NO. 16. Vocational programs should include courses in math, reading, and writing for students weak in these areas.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>30</td>
<td>0.75</td>
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<tr>
<td>Agree</td>
<td>4</td>
<td>10</td>
<td>0.25</td>
</tr>
<tr>
<td>No Opinion</td>
<td>3</td>
<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Strongly Disagree</td>
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<td>0</td>
<td>0.</td>
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</tbody>
</table>

\[ E(X) = 4.75 \]

Standard Deviation: \[ \sqrt{0.1875} = 0.4330127 \]

The responses indicated that the majority of respondents agreed or strongly agreed vocational programs should include courses in math, reading, and writing for students weak in these areas.
QUESTION NO. 17. Career planning should be made part of vocational programs.

TABLE IV - 17

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>25</td>
<td>0.625</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>15</td>
<td>0.375</td>
</tr>
<tr>
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<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>0</td>
<td>0.</td>
</tr>
<tr>
<td>Strongly Disagree</td>
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<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

E(X) = 4.625

Standard Deviation: $\sqrt{0.234375} = 0.4841229$

The responses indicated that the majority of respondents agreed or strongly agreed career planning should be made part of vocational programs.
QUESTION NO. 18. Vocational courses and work programs should be offered to assist students to pay tuition.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>15</td>
<td>0.375</td>
</tr>
<tr>
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<td>4</td>
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<tr>
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<td>1</td>
<td>0.025</td>
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</tbody>
</table>

\[E(X) = 4.35\]

Standard Deviation: \[\sqrt{0.69125} = 0.8314145\]

The responses indicated that the majority of respondents agreed or strongly agreed vocational courses and work programs should be offered to assist students to pay tuition.
QUESTION NO. 19. Counseling should be required before students enter vocational programs to better identify their needs and abilities.

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4</td>
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<td>0.50</td>
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<td>0.</td>
</tr>
<tr>
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</table>

\[ E(X) = 4.55 \]

Standard Deviation: \( \sqrt{0.4175} = 0.6461424 \)

The responses indicated that the majority of respondents agreed or strongly agreed counseling should be required before students enter vocational programs to better identify their needs and abilities.
QUESTION NO. 20. Counselors should work closely with students to follow up on their progress in courses to ensure they will be prepared to enter the workforce.

TABLE IV - 20

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>RANDOM VARIABLE</th>
<th>NUMBER RESPONDING</th>
<th>PROBABILITY P(X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>20</td>
<td>0.5</td>
</tr>
<tr>
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<td>0</td>
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</tr>
<tr>
<td>Disagree</td>
<td>2</td>
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<td>0.</td>
</tr>
<tr>
<td>Strongly Disagree</td>
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<td>0</td>
<td>0.</td>
</tr>
</tbody>
</table>

\[ E(X) = 4.5 \]

Standard Deviation: \( \sqrt{0.375} = 0.6123724 \)

The responses indicated that the majority of respondents agreed or strongly agreed Counselors should work closely with students to follow up on their progress in courses to ensure they will be prepared to enter the workforce.

Research Questions

Research studies have supported the view that changes taking place in the workplace today requires special skills. However, not all workers are expected to graduate from college but they are expected to have certain skills to meet the needs of their employers. Because of these changing needs it is proposed that the community college needs to play a larger role in preparing young men and women for the workplace, and that business and industry should
work closely with colleges and give them support that is not available from other sources. The results of this study support this view as the overwhelming responses indicated not only the importance of vocation training in the community colleges, but the need for business and industry to work with the college as a team for the benefit of the students. At the same time, business and industry can be assured that the skills needed for new jobs being opened will be available when they are needed.
CHAPTER V
SUMMARY AND CONCLUSION

SUMMARY

The use of computers began in the 1950s with the introduction of the Electronic Numerical Integrator and Computer, (ENIAC). Since that time, computers have been made smaller, with greater capabilities, and at less cost. As a result, they have found their place in almost every office, industry, and home. They have changed the concept of the workplace, and the way in which work is performed. Computer improvements have also affected the type of skills needed in the workplace today. Half of the nation's front line workers have received neither work preparation nor workforce training. Community colleges are in a good position to provide the needed preparation and training.

Last year, Congress recognized the role that community colleges must play in providing young people with the technical training they need to meet the needs of business and industry. These colleges are viewed as the best alternative to those provided by a few large companies, and the large numbers of jobs needing to be filled. Training at the community college level should also enable large numbers of young people to find meaningful employment and not remain among the numbers of the unemployed.

The purpose of this study was to investigate the types of training programs involving technology that are currently being offered at community colleges that are designed to provide students skills to meet the needs of business and
industry today. A study of the courses being offered at five Southern California community colleges will be reviewed.

This research was designed to answer the following questions:

1. What programs are available for students to achieve computer related skills in the community college?
2. What training programs are being offered?
3. What types of programs are being offered that are technical in nature, e.g., maintenance, repair and service of computers?
4. What is the relationship of skills to actual job/work?
5. How are vocational programs selected?
6. Is there a close working relationship between the college and business and industry?

The methodology selected for this study consists of both primary and secondary research. Primary research consists of a questionnaire prepared for five Southern California community colleges. The objective of the study was to determine what vocational programs are being offered in technology related fields and their effectiveness to meet needs of business and industry.

Respondents from the five southern California community colleges indicated that their college did offer courses to train students in the general use of the computer. Fewer courses were offered for programming or use of the computer in courses such as accounting. The length of the programs ranged from two to four semesters. All indicated that basic mathematics, reading and
writing were integrated into the courses offered. However, there was an absence of technical training programs other than auto mechanics. Upon completion, students were only able to enter the workforce at the entry level. This indicates that consideration should be given to increased use of apprenticeship programs that would give the student higher qualifications when applying for a position.

Secondary research for the review of literature consisted of magazine and journal articles regarding vocational training focusing on technology. The literature supported the view that community colleges are in a position to provide the training needed for the workplace today. Many are working with business and industry in an effort to meet the needs of the workplace. It is of vital importance that colleges, business, and industry work as a team to ensure that courses offered prepare young people for employment upon completion of their studies. Since the research found that students are only prepared for entry level positions, and most will need additional on-the-job training indicates that colleges need to work more closely with business and industry so that students will be better prepared when they enter the workplace so that they can be productive without additional training.

The study supported the need for academic courses to be integrated in the training programs if the student is going to be well prepared for the workplace. Employers do not have the time, money or facilities to teach new employees how to read and write, and many do not have the facilities to train employees without skills. The majority of new employees are limited to on-the-
job-training. The greatest advantage a community college can give a student is the knowledge and skills that will give him or her a competitive edge in the labor market.

Few apprenticeship opportunities are offered to community college students. Such a program could be beneficial to both the business and the college as it would be an effective way for the two to work together for the benefit of both and the student.

The research also supported the view that the government should increases its support to community colleges so that educators can offer more opportunities to young people. This is vital to the economic growth of the country for every young person who is unemployed means that the system has failed and therefore the individual become a burden on society not a productive citizen.

CONCLUSION

The role of the community college in educating young people for the work force is increasing in importance. The study has shown that community colleges cannot do the job alone. They need the support of not only business and industry, but the government, state and federal, as well. The education provided by community colleges is unique as the courses offered are not available either in high school or in four year colleges. The community college then must serve as a bridge between these two educational institutions. The community college must be designed to provide the education needed for the changing work force, and at the same time, supplement the student’s previous education.
Community college is the only institution that can provide an education that makes it possible for those who, for whatever reason, cannot attend a four year college, but yet need to acquire skills so that they can obtain meaningful employment.
BIBLIOGRAPHY


Vocational Educational Journal, 30.
February 28, 1995

Principal
Community College

I am a student at California State University, San Bernardino. I am currently completing my Master's Degree. I have selected as the subject of my thesis a study of the courses offered at the community college level to prepare young men and women to enter the workforce. The purpose of the study is to identify the relationship between business and industry and the community college, and the programs that the college is undertaking to meet the labor needs of business and industry.

For primary research I have selected five community colleges in the Southern California area. I am distributing questionnaires that I will greatly appreciate being distributed to the faculty and staff of your college.

I am aware of your busy schedules, but feel that responses from those involved in community college education are the best resource for this study. I therefore, will greatly appreciate your efforts in responding to the questionnaire.

I will return in ten days to pick up the questionnaires.

Please convey my gratitude to all those who have participated in this study. I will be pleased to send you a copy of the thesis upon completion, if you desire.

Sincerely,

Amanda Chang

Encl.
QUESTIONNAIRE

The purpose of this study is to investigate the types of training programs involving technology currently being offered at the community college level that are designed to provide students skills to meet the needs of the courses being offered at five community colleges will be reviewed.

School:

Title of person interviewed

If a teacher: subject taught:

Years with the school:

1. Computer programs available at the college:
   a. Software:
      General use - e.g., word processing
      Programming - Cobol, Basic, Fortran, etc.
      Accounting - spreadsheets, graphics, etc.
   b. Hardware:
      Repair
      Enhancements - adding components, eg., upgrade, modems, etc.
      Building computers

Length of programs:

Software: Semester(s)

Hardware: Semester(s)
2. What other programs are offered to support these programs:
   - Mathematics
   - Reading, Writing
   - Engineering
   - Drafting
   - Graphics design
   - Other:

3. What other technical training programs are available to students desiring to acquire skills for business and industry:
   - Auto mechanics
   - Television, VCR, repair
   - Home Appliance repair
   - Plumbing
   - Electrical

4. Relationship of skills acquired to actual job/work:
   - Entrance level
   - More training required (e.g., on the job)
   - Apprenticeship
   - Other:

   Are jobs offered for students by these companies once the training has been completed?

   Yes     No

*Directions* Please indicate your opinion by placing an X in the appropriate box.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree Opinion</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Vocational programs are selected based on needs of business & industry.
2. What other programs are offered to support these programs:

___ Mathematics
___ Reading, Writing
___ Engineering
___ Drafting
___ Graphics design
___ Other: ________________________________

3. What other technical training programs are available to students desiring to acquire skills for business and industry:

___ Auto mechanics
___ Television, VCR, repair
___ Home Appliance repair
___ Plumbing
___ Electrical

4. Relationship of skills acquired to actual job/work:

___ Entrance level
___ More training required (e.g., on the job)
___ Apprenticeship
___ Other: ________________________________

Are jobs offered for students by these companies once the training has been completed?

___ Yes  ___ No

**************************************************************************
Directions Please indicate your opinion by placing an X in the appropriate box.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

1. Vocational programs are selected based on needs of business & industry.
<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>No Opinion</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
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</thead>
<tbody>
<tr>
<td>2.</td>
<td>Vocational programs are state mandated.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3.</td>
<td>Vocational programs are determined by the School Board/committee, etc.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4.</td>
<td>There is a close working relationship between the college and business &amp; industry.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5.</td>
<td>Business &amp; industry help to identify their needs and develop vocational programs for such needs.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6.</td>
<td>There should be a closer working relationship between the college, business and industry.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>7.</td>
<td>Business &amp; industry should provide teachers/instructors in college classes.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.</td>
<td>Employers should provide lecturers for the college vocational courses.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9.</td>
<td>Business &amp; industry contribute money, equipment, tools, etc. to the college.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10.</td>
<td>Business &amp; industry opens doors to students for field trips.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>11.</td>
<td>Vocational education should play a greater role in education due to the introduction of new technology.</td>
<td>☐</td>
<td>☐</td>
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<tr>
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<td>Disagree</td>
<td>Strongly Disagree</td>
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<td>---------------</td>
<td>-------</td>
<td>------------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td>12. Vocational training in high schools is not sufficient to prepare young people to enter the workforce.</td>
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<tr>
<td>13. Need for vocational training will be greater in the next ten years.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>14. The community college should play a greater role in the community to meet the needs of the community.</td>
<td></td>
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<tr>
<td>15. More state/federal funds should be made available to community colleges to support needed programs.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>16. Vocational programs should include courses in math, reading, and writing for students weak in these areas.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Career planning should be made part of vocational programs.</td>
<td></td>
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</tr>
<tr>
<td>18. Vocational courses and work programs should be offered to assist students to pay tuition.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>19. Counseling should be required before students enter vocational programs to better identify their needs and abilities.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>20. Counselors should work closely with students to follow up on their progress in courses to ensure they will be prepared to enter the workforce.</td>
<td></td>
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Additional Comments:

Thank you.