DOCUMENT RESUME

ED 089 088 CE 001 143

AUTHOR	Bennett, Robert L.
TITLE	Career Education Planning for the 1970s and 1980s. Planning Report Number I.
INSTITUTION	San Mateo Junior Coll. District, Calif.
PUB DATE	12 Jan 73
NOTE	54p.
EDRS PRICE	MF-$0.75 HC-$3.15 PLUS POSTAGE
DESCRIPTORS	*Career Education; Community Colleges; Educational Change; *Employment Opportunities; Enrollment Projections; *Junior Colleges; Manpower Needs; *Program Planning; School Industry Relationship; Vocational Education
IDENTIFIERS	San Francisco Bay Area

ABSTRACT

This report aims to provide Phase 1 "first-round" information and preliminary recommendations to lead toward more intensive career education planning. The report discusses: (1) possibilities for revision and expansion of career training programs to meet the needs of the 1970s and 80s, (2) the effect on the careers of the future by the increasingly rapid changes in technology and communications, (3) the projected employment growth areas for the San Francisco Bay Region and throughout the nation, and (4) the San Mateo Junior College District's position, currently and potentially, in career training, including revisions and expansion projected to insure orderly career program development. To illustrate the district's educational position, the report includes detailed comparison of the present occupational course offerings of the three colleges with projected needs through the year 1980. In conjunction with those needs, the concept of coordinated training between educational institutions and industry is discussed. Planning and development recommendations included in the report are based on the United States Department of Labor Bureau of Labor Statistics projections and documented observed trends of continuing change in technology and social needs. (Author)

CAREER EDUCATION PLANNING FOR THE 1970s AND 1980s

SAN MATEO JUNIOR COLLEGE DISTRICT

CAÑADA COLLEGE * COLLEGE OF SAN MATEO * SKYLINE COLLEGE

PLANNING REPORT NUMBER I

January 12, 1972

Dr. Robert L. Bennett
Assistant to Chancellor/Superintendent
for Resource Development & Project Coordination
San Mateo Junior College District
2040 Pioneer Court
San Mateo, California 94402

STATEMENT OF PURPOSE

This report aims to provide Phase I "first-round" information and preliminary recommendations to lead toward more intensive career education planning. The report discusses:

1. Possibilities for revision and expansion of career training programs to meet the needs of the 1970s and 80s.

2. The effect on the careers of the future by the increasingly rapid changes in technology and communications;

3. The projected employment growth areas for the San Francisco Bay Region and throughout the nation;

4. The San Mateo Junior College District's position, currently and potentially, in career training, including revisions and expansion projected to insure orderly career program development.

To illustrate the district's educational position, the report includes detailed comparison of the present occupational course offerings of the three colleges with the projected needs through the year 1980. In conjunction with those needs, the concept of coordinated training between educational institutions and industry is discussed. Planning and development recommendations included in the report are based on the United States Department of Labor Bureau of Labor Statistics projections and documented observed trends of continuing change in technology and social needs.

THE PROBLEM

Knowledge, technology and new careers are developing at an ever-more rapid rate to the extent that today a person entering the work force can expect to change jobs six to seven times during his working life.

The concept of a lifetime career is becoming inadequate as a frame of reference for career education. Many jobs now and in the future will evolve and fade within a period of a few years. To meet this new trend in employment patterns, community college career education must prepare now to provide greater services to numbers of people for education, re-training and upgrading--including counseling and information as it is needed. The question of how to prepare students now for as-yet-unknown careers of the future is one of immediate concern for today's educators. The question of how to meet community needs for continuous career information and guidance is equally as important.

THE RESPONSE

Among the primary needs to be considered by the colleges of the San Mateo District are:

--increased flexibility for enrollment and progress within programs, general and occupational, including the re-design of programs to increase the opportunity for students to complete courses and to reduce the dropout rate;

--redefinition and expansion of career programs to meet new and emerging kinds of student and community needs;

--revision and/or deletion of low enrollment or outdated segments of present programs;

--tying industry and business "in-house" training programs to college career programs including consideration of college credit for high quality industrial and business training programs;

--development of community career guidance and counseling centers to meet the need for continuous information and assistance in new career directions;

--expanded cooperative education opportunities;

--changing the process to include flexibility in instruction through such means as modular, self-paced, learning systems;

--reaching out and focusing on upgrading and re-training those who work at unskilled jobs with insecure futures including the unemployed, in order to reduce the welfare load on the community and to raise the standard of living of the poor

THE PHENOMENAL GROWTH OF KNOWLEDGE

"...If the last 50,000 years of man's existence were divided into lifetimes of approximately 62 years each, there have been about 800 such lifetimes.

"Of these 800, 650 were spent in caves.

"Only during the last 60 lifetimes, with the advent of writing, has it been possible to communicate effectively from one lifetime to another. Only within the last six lifetimes did masses of men ever see a printed word. Only during the last four has it been possible to measure time with any precision. Only in the last two has anyone anywhere used an electric motor.

"The overwhelming majority of all material goods we use in daily life today has been developed within the present, the 800th, lifetime."[1]

---

[1] Boulding, Kenneth, THE MEANING OF THE TWENTIETH CENTURY, New York, Viking, 1954.

Commented Dr. Robert Hilliard, top educational broadcasting specialist for the Federal Communications Commission, "At the rate at which knowledge is growing, by the time the child born today graduates from college, the amount of knowledge in the world will be four times as great. By the time that same child is fifty years old, it will be 32 times as great and 97 per cent of everything known in the world will have been learned since the time he was born."

The rising tide of new knowledge forces us into ever-narrower specialization and drives us to revise our inner images of reality at ever-faster rates.

In the words of psychoanalyst Erik Erikson, "In our society at present, the 'natural course of events' is precisely that the rate of change should continue to accelerate up to the as-yet-unreached limits of human and institutional adaptability."[2]

Marshall McLuhan in the Future of Education noted, "...When automated electronic production reaches full potential, it will be just about as cheap to turn out a million differing objects as a million exact duplicates. The only limits on production and consumption will be the human imagination."

New knowledge opens up new resources--and more new knowledge--in a naturally evolving discovery process. But it must be remembered that, as the contemporary social thinker Toffler has noted, "The only way to maintain any semblance of equilibrium during the super-

2. Erikson, Erik H. THE CHALLENCE OF YOUTH, Garden City, N.Y. Anchor Books, 1962.

industrial revolution will be to meet invention with invention--to design new personal and social change-regulators. Thus, we need neither blind acceptance nor blind resistance, but an array of creative strategies for shaping, deflecting, accelerating or decelerating change selectively. The individual needs new principles for pacing and planning his life along with a dramatically new kind of education. He may also need specific new technological aids to increase his adaptivity."[3]

KNOWLEDGE

The rapid obsolescence of knowledge and the extension of life span make it clear that the skills learned in youth are unlikely to remain relevant by the time old age arrives. Community college education must therefore make provision for life-long education with provision for easy entrance and exit at any time during the year.

If learning is to be stretched over a lifetime, there is reduced justification for forcing students to attend school full-time. For many young people, part-time schooling and part-time work at semi-skilled, paid and unpaid community service tasks and other regular employment will prove more satisfying and educational.

To survive, to avert what has been termed "future shock", the individual will need to become infinitely more adaptable and capable than ever before. Psychophysiologists studying the impact of change on various organisms have shown that successful adaptation can occur when

[3]Toffler, Alvin, FUTURE SHOCK, Random House, New York, 1970, pg. 331.

the level of stimulation--the amount of change and novelty in the environment--is neither too low nor too high.[4]

PREPARING STUDENTS TO WORK IN UNKNOWN CAREERS

Today the average 20 year old man in the work force can be expected to change jobs about six or seven times during his working life, according to the U. S. Department of Labor. Thus, instead of thinking in terms of a career, the citizen of the late 1970s, 1980s and beyond will need to think in terms of a series of related careers.

Already in the current situation people in highly-specialized engineering and science areas are experiencing difficulty in marketing their skills, particularly in the aerospace area. The prospect of re-training for another specialization is an emotionally and professionally traumatic reality for many.

This trauma recently was reported in the Wall Street Journal in an article surveying the situation that has developed since the beginnings in 1969 of cutbacks in defense and aerospace industries. Nearly 5% of the nation's engineers can't find a full-time job in their profession, the Journal learned from the Engineers Joint Council in New York, and the effects have been evaporated savings from extended joblessness, deteriorating emotional and physical health, soured marriages, and frustration to the point of attempted and accomplished suicides.[5]

---

[4] Welch, Bruce L. "Psychophysiological Response to the Mean Level of Environmental Stimulation: A Theory of Environmental Integration" paper presented in a Symposium on Medical Aspects of Stress in the Military Climate (Washington: Walter Reed Army Institute of Research, Walter Reed Army Medical Center, 1964).

5. Wall Street Journal, "As Jobs Stay Scarce, Unemployed Engineers Face Family Crises", Tuesday, Nov. 30, 1971, page 1, column 1.

Specialization increases the number of different occupations. At the same time, though, technological innovation reduces the life expectancy of any given occupation. "The emergence and decline of occupations will be so rapid," says economist Norman Anon, an expert in manpower problems, "that people will always be uncertain in them." The profession of airline flight engineer, he notes, emerged and then began to die out within a brief period of fifteen years.

When Fortune magazine in the late 1960s surveyed 1,003 young executives employed by major American corporations, it found that fully one out of three held a job that simply had not existed until he stepped into it. Another large group held positions that had been filled by only one incumbent before them. Even when the name of the occupation stays the same, the content of the work is frequently transformed and the people filling the jobs change.[6]

EDUCATION FOR CHANGE

Two problems are evident which concern Community College programs.

1. The introduction of advanced technology is accompanied by drastic changes in the types of skills required by people.

2. Specialization increases the number of different occupations and at the same time technical innovation reduces the life expectancy of any given occupation.

The response of education will need to be flexible, continuous opportunity for career growth including counseling and guidance.

---

6 Guzzardi, Walter, Jr., THE YOUNG EXECUTIVES, New York, New American Library, 1966

A career training study by the Regents of the University of the State of New York[7] goes on to say,

> Programs are needed to prepare workers for jobs which exist and are emerging, and to enable those already in the labor force to maintain job security even as occupational requirements change. The fundamental need is for an occupational education system as comprehensive and flexible as the society it serves is complex and changing.

The concept of a lifetime career, therefore, is changing.

With the conditions of a rapidly-changing and evolving society employees of today and the future can expect not only to change jobs several times but also to realistically face changes in careers.

This reality needs to be dealt with by employees, employers, and educational and vocational training institutions.

It is necessary to assess even more frequently the occupational needs of the future and the career programs now available and determine how to structure the programs to keep pace with the changes.

JOBS ARE CHANGING

A recent survey by the U. S. Department of Labor revealed that the 71,000,000 persons in the American labor force had held their current jobs an average of 4.2 years. This compared with 4.6 years only three years earlier, a decline in duration of nearly 9 per cent.

The high rate of job turnover now evident in the United States is also increasingly characteristic of Western European countries. In England turnover in manufacturing industries runs an estimated 30 to 40

7. Position paper on occupational education: A Statement of Policy by the Regents of the University of the State of New York, State Department of Education, Albany, May 1971. Page 5.

per cent per year. In France, about 20 per cent of the total labor force is involved in job changes each year, and this figure is on the rise. According to Olof Gustafsson, Director of Swedish Manufacturing Association, "We count on an average turnover of 25 to 30 per cent per year in the labor force...Probably the labor turnover in many places now reaches 30 to 40 per cent."

Not taken into account are changes of job within the same company or plan or shifts from one department to another. A. K. Rice of the Tavistock Institute in London asserts that "transfers from one department to another would appear to have the effect of the beginning of a 'new life' within the factory."[8]

PROGRAM PLANNING ASSUMPTIONS

Changing employment patterns and a growing economy are two of the chief indicators of new directions for vocational education. Phase I program planning for students of Cañada, San Mateo and Skyline Colleges is based upon the assumption that for the most part they will choose to live and work in the San Francisco Bay Region. Plans for expansion and improvements in vocational education for these community college students will need to reflect the changing employment trends and patterns as projected through the 1980s by U. S. Department of Labor reports and other sources of information. Considering the national trend toward mobility it can be assumed that the employment patterns of this crossroads area of the world are not too different from the kinds of employ-

8. Rice, A. K. "An Examination of the Boundaries of Part-Time Institutions", HUMAN RELATIONS, Vol. 4, #4, 1951, page 400.

ment found in other major urban centers of the United States.

To prepare students for entering occupations in the decades ahead, the first need is to prepare them to adapt to changing work patterns as automation and new business procedures are developed. This task includes career guidance and counseling. The second need is to prepare students to participate in a changing national economy estimated to be $2 trillion per year during the 1980s. As a result there will be a shift toward service industries. Thirdly there is a need for community colleges to provide leadership in development of improved methods for training, re-training and upgrading of students skills as employment trends require increasing levels of competence.

Throughout their history of development the colleges of the San Mateo District have been dedicated to serving the needs of the community. The district is recognized as one of foremost nationally recognized college systems for outstanding vocational-technical programs. It is important now to continue this leadership and this dedication to serving the total community.

MEETING THE NEEDS OF THE 70s AND 80s

Within the colleges there is the need to revise and upgrade present curricula to meet the needs of the '70s and '80s and beyond. To do this, innovative instructional techniques, including among others the concept of career clusters can be used. This educational design includes a "core" of courses for a group of related careers with many specialties branching from the common base. Advanced studies in this kind of program are often provided through modular, student self-paced learning techniques.

Public Service Careers at Cañada is an example of the "cluster-career" concept with seven branches of specialty instruction. Advanced programmed learning is being used in at least one of the program branches.

Along with this, evidence shows that a substantial amount of what is being attempted in present low-enrollment, high-cost classes could be learned on-the-job. Industrial and business training programs can be combined with cooperative work experience. Cooperation between colleges, business, industry and civic agencies can be mutually beneficial because (1) students can learn on the most up-to-date equipment using modern techniques, and making a smooth transition from entrance-level jobs to advanced technical proficiency; (2) industry benefits from having college trainees learning and doing at the same time; (3) quality of education is improved at the same time as costs are reduced.

COUNSELING AND GUIDANCE CENTERS

Community colleges, because of their close ties to the community should consider providing increasing services of counseling and guidance through "public service centers" in response to the need of persons in the community seeking re-training direction. Education, re-training, upgrading, counseling and placement is without doubt the career pattern of the automated, service-oriented world of the near future. Community colleges must be among the important public agencies responding to the new trends.

FLEXIBILITY OF INSTRUCTIONAL DESIGNS

Education for full employment really means education that develops all the qualities of people rather than specific skills. It is not enough to consider only vocational skill development or manpower

re-training or education solely toward any special aspect of education. The great need for career education today is to emphasize the development of general occupational capability with emphasis on technical performance, positive attitude toward work, ability to relate well with people and adaptability to change.

Successful career education in community colleges calls for a new relationship between classrooms and the community of work. The single-goal, single-route structure will need to give way to multi-program, flexible approaches geared to the students enrolled. Career education will need to become more closely allied with the total educational program of the college. Moreover, the total educational program of the college will need to become more closely allied with the business and industrial operations in the community.

A recent statement of Isaac L. Auerbach, President of the International Federation for Information Processing illustrates the kind of new career planning outlook that is needed:

> ...While automation will probably eliminate many jobs, the technologies of the information revolution will create many more jobs.
>
> I would like to state my firm conviction that the positive impact of the information revolution on men and countries throughout the world will far exceed that of any other already conceived technological development. Our government agencies (and our schools) are undoubtedly not aware of the power of the tools we have developed, or the potential scope of their application.

NEW TRENDS IN EDUCATION

Among the new techniques being used for career development instruction in community colleges are team teaching, diversified staff utilization, television instruction for on-campus and off-campus teaching and the use of coordinated instruction systems. Large group team teaching is being developed also as a means of providing quality instruction with a greater variety of talent in the presentation. Students gain the services of more of the professional staff through the process.

Television allows the instruction to be brought to a large audience at a variety of times and with the advantage of repeat broadcasting. Other forms of coordinated instruction systems may include the use of slides and synchronized audio tapes which the student can use at his convenience. By these methods career education can be made available at a variety of times and places to students who would not otherwise be able to participate.

Education, which is a major cultural force in society, is being pushed to diversify its output much in the same manner as business and industry are doing. And here, as in the realm of material production, the new technology, rather than fostering simple standardization, carries us toward improved quality and greater diversity.

Computers, for example, make it easier for a large school to schedule more flexibly. They make it easier for the school to cope with independent study, with a wider range of course offerings and more varied extracurricular activities. More important, computer-assisted education, programmed instruction and other such techniques, despite popular misconceptions, radically enhance the possibility of diversity

in the classroom. They permit each student to advance at his own personal rate of progress. They permit him to follow a custom-cut path toward knowledge, rather than a rigid single pathway as in the traditional classroom.

In the educational world of tomorrow according to many experts the centralized work place--the classroom--will become less important. Just as economic mass production required large numbers of workers to be assembled in factories, educational mass production required large numbers of students to be assembled in schools. This itself, with its demands for uniform discipline, regular hours, attendance checks and the like, is a standardizing force. Advanced technology will, in the future, make much of this unnecessary. A good deal of education will take place in the student's own room at home or in a dorm, at hours of his own choosing. With vast libraries of data available to him using computer terminals for information retrieval, with his own tapes and filmstrip units, his own programmed learning text materials and his own casette video tapes, he will be freed from much of the restrictions and lack of individual self-paced opportunities which are not a part of the lockstep classroom.

Many changes are foreseen in instructional techniques. Today lectures still dominate the classroom. This method symbolizes the old top-down pattern of teaching modeled from the production structure of industry. While still useful for limited purposes, lectures must inevitably give way to a whole battery of teaching techniques, ranging from televised instruction to computer-mediated seminars and the immersion of students in what we might call 'contrived experiences'."[9]

9. Howe, Harold, "The City as Teacher" THE SCHOOLHOUSE IN THE CITY, New York, Praeger, 1968.

BUSINESS AND INDUSTRIAL EDUCATION PROGRAMS: A NEW COLLEGE CONCEPT

In the search for new methods of providing career education, career re-training and upgrading for large numbers of people, it should be noted that there is an enormous reservoir of up-to-date business and industrial education programs which could be brought to bear on the process of college education. The task, in this case, would be to assist and encourage employed students of all ages to advance through their company education programs. Most of the programs are for the purpose of developing supervisory and management skills or to increase knowledge and improve techniques in the use of latest types of technical equipment. These business and industry programs are usually re-designed and updated each year to meet the most urgent needs of the marketplace. They represent the best efforts of major employers under the free-enterprise system to respond to current demands for improved products and services.

The task of the college would be (1) to place a credit value on the business and industrial programs; (2) to assist students to enroll in other course work at the college which would reinforce and strengthen the total educational program for the student; and (3) provide on-going counseling and information services to assure that the student makes continuous progress to achieve his goals of education, career re-training or upgrading.

INDUSTRIES WITH A HEAVY INVOLVEMENT IN TRAINING ARE AMONG THE MOST RAPIDLY GROWING INDUSTRIES IN THE ECONOMY[10]

INDUSTRY DIVISION	PERCENT WITH TRAINING PROGRAMS	PERCENT EMPLOYMENT GROWTH PROJECTED
All Industries	20	25.0
Mining	17	-1.9
Contract Construction	24	31.5
Manufacturing	17	9.2
Transportation, communication and public utilities	18	13.5
Finance, insurance and real estate	34	23.2
Retail trade	27	27.4
Wholesale trade	14	24.8
Services (other)	23	42.5

As can be seen from the chart, employment growth in the field of mining is on the decline. Yet the mining industry is in a period of change requiring extensive research and development to meet future challenges.

For example the sea, which is as yet relatively untouched, is the new frontier in the development of mining for the purposes of providing increased mineral, food and drug resources. Minerals, such as manganese nodules and petroleum on and below the ocean floor, and foods and drugs from sea organisms await efficient and economical extractive technology. High-speed aircraft production and nuclear reactor technology will require increasing need for such exotic minerals as titanium and zirconium and development of methodology for lower-cost mining and production.

10. Department of Labor Information

According to Dr. F. N. Spiess, head of the Marine Physical Laboratory of the Scripps Institute of Oceanography, "Within fifty years man will move onto and into the sea--occupying it and exploiting it as an integral part of his use of this planet for recreation, minerals, food, waste disposal, military and transportation operations, and, as populations grow, for actual living space."[11]

More than two-thirds of the planet's surface is covered with ocean--and of this submerged terrain a bare five per cent is well mapped. However, this underwater land is known to be rich with oil, gas, coal, diamonds, sulphur, cobalt, uranium, tin, phosphates and other minerals. It teems with fish and plant life.[12]

Technologically, novel industries will rise to process the output of the oceans. Others will produce sophisticated and highly-expensive tools for working the sea--deep-diving research craft, rescue submarines, electronic fish-herding equipment and the like. The rate of obsolescence in these fields will be swift. The competitive struggle will spur ever-accelerating innovation.[13]

The increasing ability to alter weather, the development of new energy sources, new materials, new transportation means, new foods--not only from the sea, but from huge hydroponic food-growing factories--all these only begin to suggest the nature of the accelerating changes that lie ahead.

---

[11] Spiess, Dr., article on ocean mining, NEW YORK TIMES, July 17, 1966

[12] KAISER ALUMINUM NEWS, #2, "Lure of the Lost World" 1966

[13] Gordon, T. J., "The Feedback Between Technology and Values" Baier, Kurt & Rescher Nicholas, VALUES AND THE FUTURE, New York, The Free Press, 1969.

FUTURE JOB TRAINING DIRECTIONS

A recent report from the U. S. Department of Labor provides this information:

> Training and education, undertaken by business and industry, as well as by public and private institutions--ranging from very informal to highly-structured programs--generally have equipped a large part of the work force with the skills needed for employment.
>
> However, training and related services have not been sufficiently available and are needed:
>
> --by large numbers of disadvantaged persons to qualify them for job entry and for continuing employment;
>
> --by many thousands of young people to help them successfully bridge the gap between school and work;
>
> --to provide sufficient trained manpower in emerging occupations;
>
> --to provide upgrade training to meet skill shortages, provide opportunities for individuals to advance up the career ladder, and to open up entry-level jobs to less-qualified individuals; and
>
> --to meet the large increase expected in the years ahead in our work force and the growing demand for skills requiring specialized training.
>
> The commitment to career education must be continuous and responsive to long-term requirements rather than only to immediate crisis situations.
>
> Since business and industry employ most workers in our economy and have established expertise in occupational training, they should play significant and more effective roles in attaining educational objectives. Employers can also provide leadership in the improvement of education and training to make these programs more relevant to today's manpower needs.

CHOOSING A CAREER: OCCUPATIONAL OUTLOOK HANDBOOK

Choosing a career is one of the most important decisions a person will make in his lifetime. Planning a career calls for two areas of study (1) an evaluation of an individual's abilities and interests and (2) gaining knowledge of employment opportunities that will be favorable or not so favorable in the future.

A Point of Departure

Analyses of the economy's industrial composition show that work locations have changed sharply over the years and are expected to continue to do so. These changes greatly affect employment opportunities and occupational choices.

Industries in the nation can be viewed either as goods-producing or service-producing.

Most of the nation's workers are in industries producing services such as education, health care, trade, repair and maintenance, government, transportation, banking and insurance service.

The production of goods--raising food, extracting minerals, and manufacturing of goods--has required less than half of the country's work force since the late 1940s.

MULTIPLE FACTORS TO WEIGH IN CAREER CHOICE

In considering a career, occupations should not be eliminated just because they will not be the most rapid growing. Replacement needs will be particularly significant in occupations which have a large proportion of older workers and women. Large occupation areas that

have little growth may offer more openings than a fast-growing small one. Openings for operatives resulting from growth and replacement combined will be greater than for craftsmen, although the rate of growth of craftsmen will be more than twice as rapid as the rate of growth for operatives.

Employers are seeking people who have higher levels of education and training because jobs are more complex and require greater skill. Employment growth generally will be fastest in those occupations requiring the most education and training. Professional occupations requiring the most education will show the fastest growth through the 1970s.

Unemployment falls heaviest on the worker who has the least education. Getting as much education and training as one's abilities and circumstances permit should be a top priority.

A statement from U. S. MANPOWER IN THE 1970S OPPORTUNITY AND CHALLENGE, U. S. Department of Labor, notes:

> In this decade, as in the last, the fastest growing occupations are professional and technical, the ones requiring the most educational preparation.
>
> This occupational group will increase by 50% by 1980.
>
> Service occupations (excluding private households) will rank second only to professionals with a growth of 45 percent.
>
> By 1980, for the first time, there will be as many professional and technical workers as blue-collar operatives.

> Yet there will be many good jobs in the economy for which limited career education is sufficient: there will be more than 15 million operative jobs. Clerical occupations, with more than 17 million workers, will be larger than any other occupational group.
>
> Jobs in craft skills are increasingly well-rewarded financially, reflecting a continuing need for highly skilled workers in the economy.[14]

FAST GROWTH SEEN IN SERVICE PRODUCING INDUSTRIES

Job growth through the 1970s is expected to continue to be fast in the service producing industries.

Trade, the largest division within the service producing industries has expanded sharply. Wholesale and retail outlets have multiplied in large and small cities to satisfy the need of an increasingly urban society. However, the rate of increase in manpower needs will be slowed by labor-saving technology.

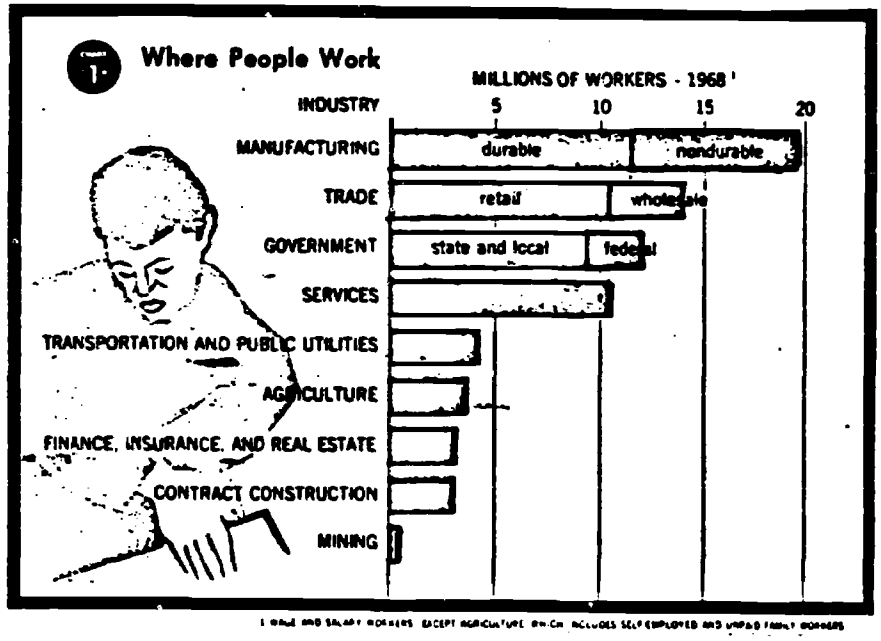
Government employment has grown faster than any other industry division. Growth has been mostly at the state and local levels. Employment growth has been greatest in agencies providing education, health, sanitation, welfare and protective services.

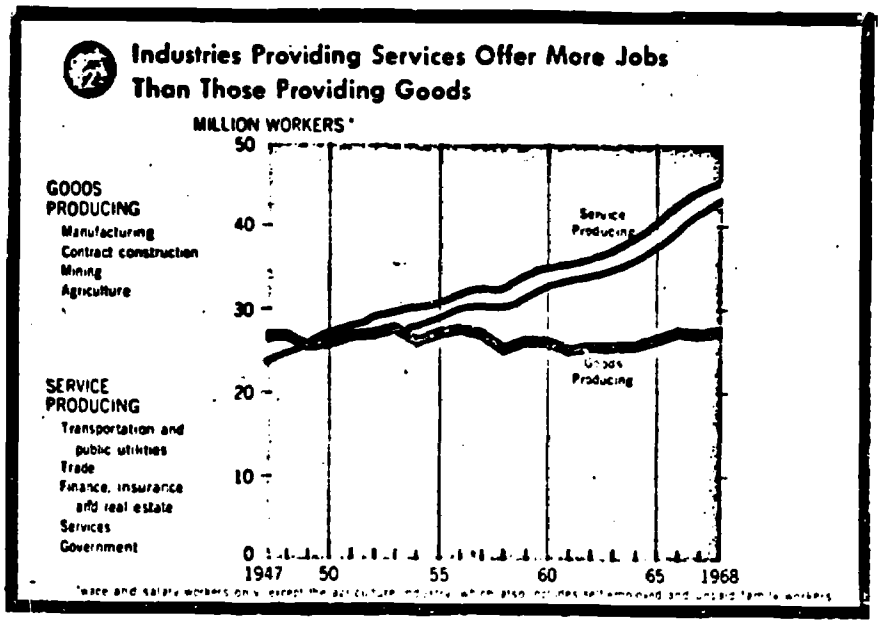
Services, such as Health Care, Respond to Growing Needs

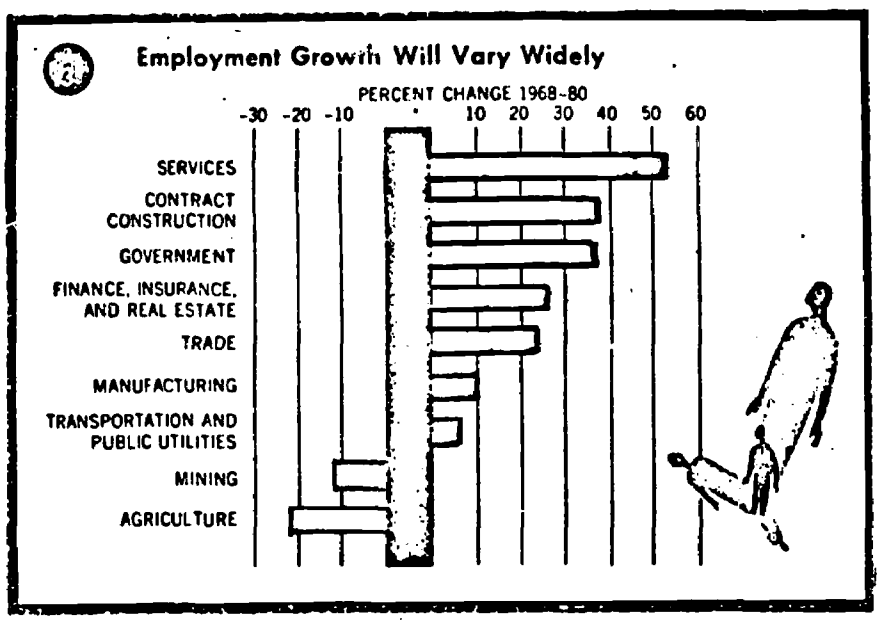
Services and miscellaneous industries have increased rapidly since World War II as a result of the growing need for maintenance and repair advertising, domestic and health care services and they will continue to be among the fast-growing industries through the 1970s.

---

[14] Superintendent of Documents, Government Printing Office, Washington D.C., 20204







Manpower requirements in health services are expected to grow rapidly due to population growth and the increasing ability of persons to pay for health care.

The number of jobs in transportation and utilities as a whole is expected to continue to increase slowly through the 1970s. Rapid increases in employment are expected in air transportation and a decline is expected to continue in railroad employment.

Rapid Advances Seen in Finance Related Jobs

Finance, insurance and real estate, the smallest of the service producing industry divisions, has grown about 90 per cent since World War II. Employment has grown especially rapidly in banks, credit agencies and security and commodity brokers, dealers, exchanges and services.

The most rapid advances will be in banking and credit agencies, which, combined, account for nearly two-fifths of total employment in this industry division.

EMPLOYMENT GROWTH SLOWER IN GOODS-PRODUCING INDUSTRIES

Employment in goods-producing industries has increased slowly in recent years. Significant gains in productivity resulting from automation and other technological developments as well as the growing skills of the work force have permitted large increases in out-put without corresponding increases in employment.

Declines Forecast in Several Job Areas

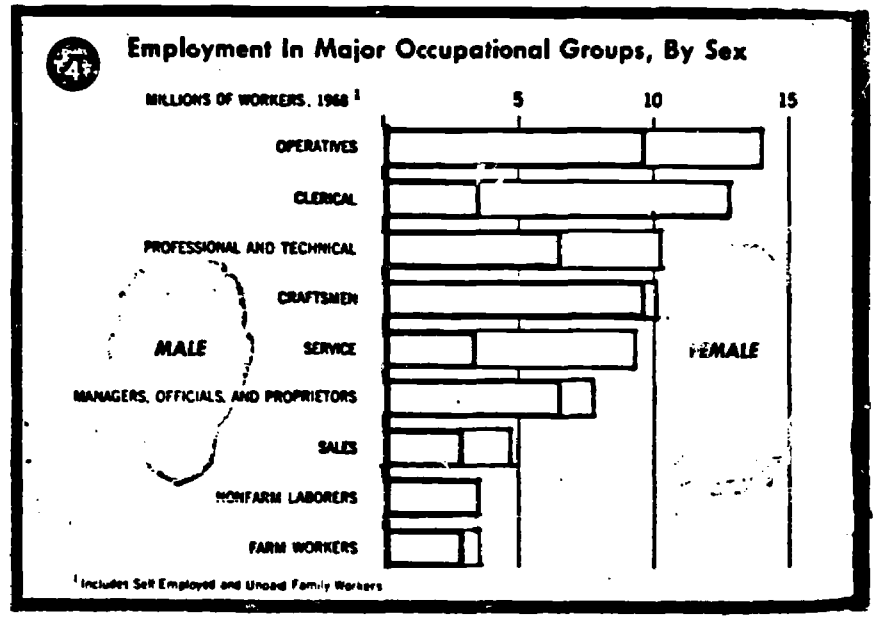
Employment in agriculture has dropped by more than one half since 1947. Increases in the average size of farms, rapid mechanization, and improved fertilizers, feeds, and pesticides have created large increases in out-put at the same time that employment has fallen sharply.

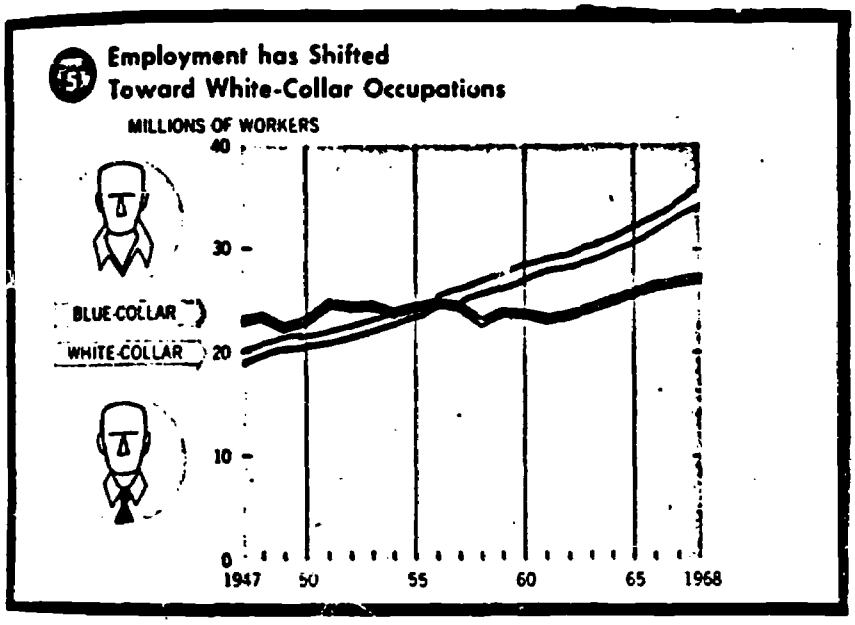
The job level of the entire mining group is expected to decline about 10 per cent by 1980.

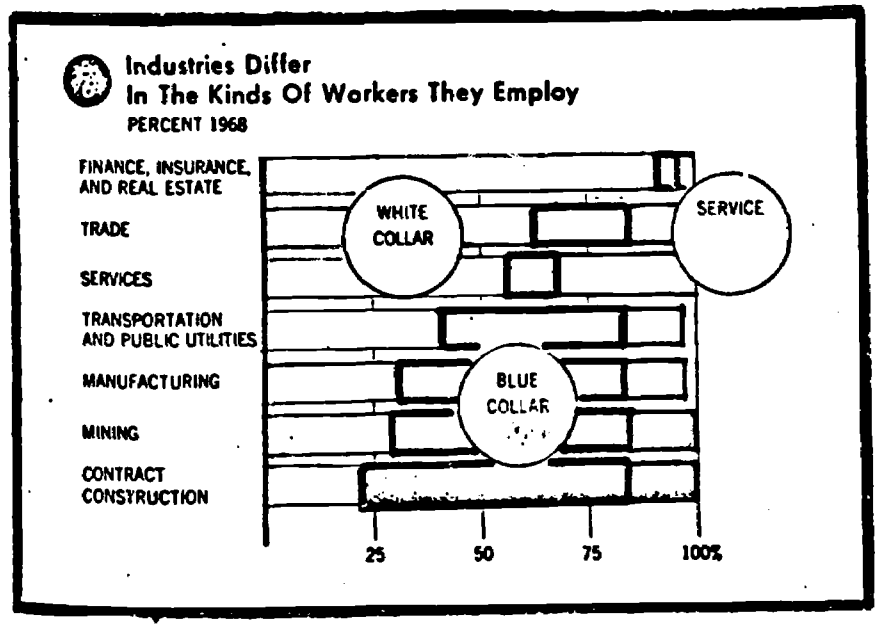
Construction activity will be spurred by several factors. An expanding economy will result in more industrial plants and commercial establishments such as office buildings, stores and banks. The volume of construction maintenance and repair, which is now about one-third of new construction activity, also is expected to grow significantly through the 1970s.

The rate of growth will vary among the individual manufacturing industries with sizeable increases for producers of rubber and plastic products, furniture and fixtures, stone, clay and glass products, and instruments while others such as petroleum refining and ordnance are expected to decline.

As American industries continue to grow larger, more complex, and more mechanized, occupations will reflect that in complexity and increased specialization.







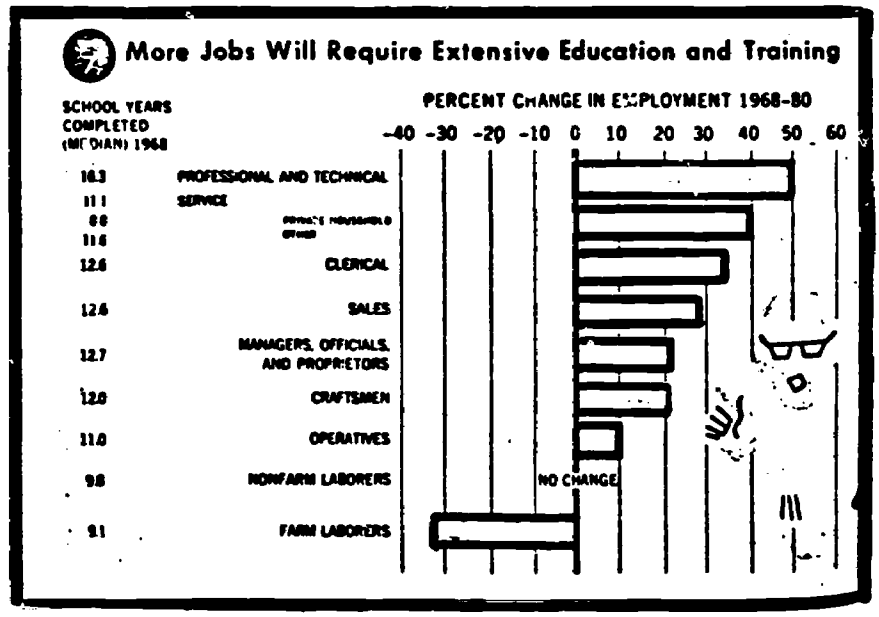
NATIONAL OCCUPATION STRUCTURE SHIFTING TO WHITE COLLAR JOBS

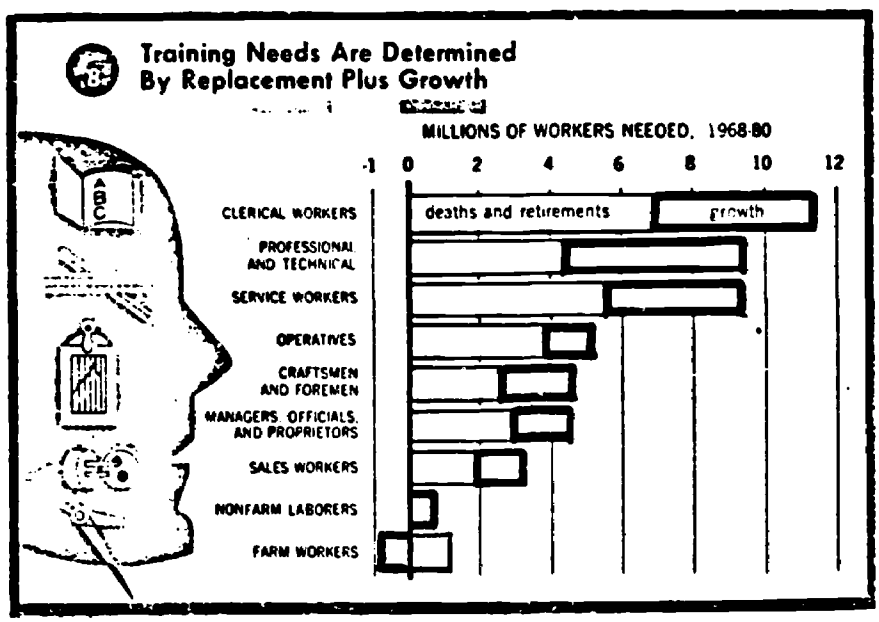
Among the most significant changes in the structure has been the shift toward white collar jobs. Through the 1970s, it can be expected that there will be a continuation of the rapid growth of white collar occupations, a slower than average growth of blue-collar occupations, a faster than average growth among service workers, and a further decline of farm workers. Total employment is expected to increase about 25 per cent between 1968-1980. An increase of about 36 per cent is expected for white-collar jobs, and only about 13 per cent for blue-collar occupations. The growing demand for workers to perform research and development, to provide education and health services, and to process the increasing amount of paperwork throughout all types of enterprises, will be significant in the growth of white-collar jobs.

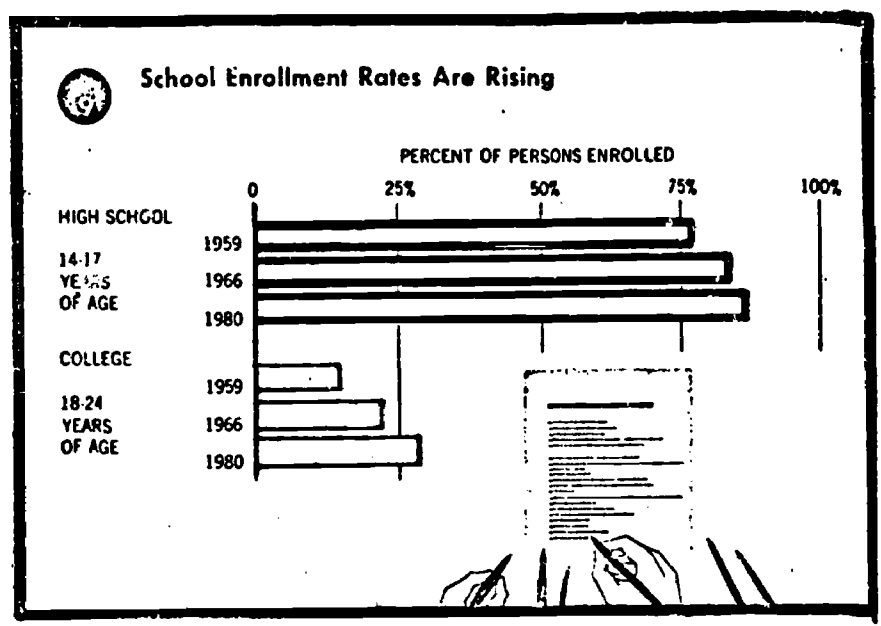
Professional Occupations will be Fastest Growing

Professional occupations will be the fastest growing occupation. The quest for scientific and technical knowledge is bound to grow and raise the demand for workers in scientific and technical specialities.

There will be continuing emphasis in the social sciences and medical services. Managers, officials and proprietors, as a group will increase somewhat slower than the rate of growth for all occupations. More rapid increase is expected for salaried managers because of the increasing dependence of business organizations and government agencies on management specialists. A decline in the number of self-employed managers is expected as larger businesses restrict growth of the total number of firms.







The need for clerical workers is expected to increase by about one-third by 1975.

The expected increase in residential and commercial construction and urban renewal will increase the need for real estate agents. Changes in distribution methods, such as self-service and automatic vending, are likely to restrict the employment growth of sales workers.

Technological Developments Will Limit Crafts Growth

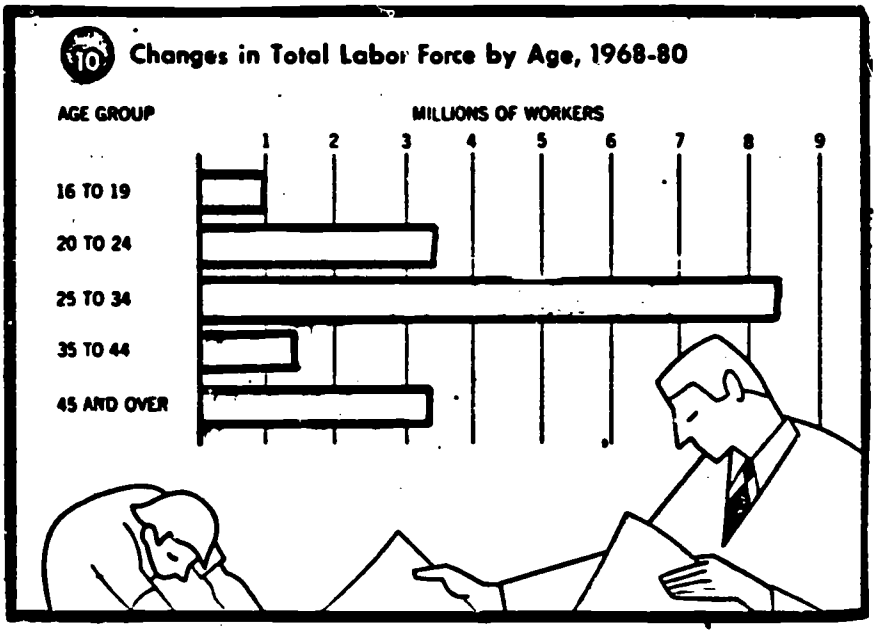
Technological developments will tend to limit the expansion of crafts occupations opportunities. Craftsmen jobs are expected to increase somewhat slower than the growth of all occupations.

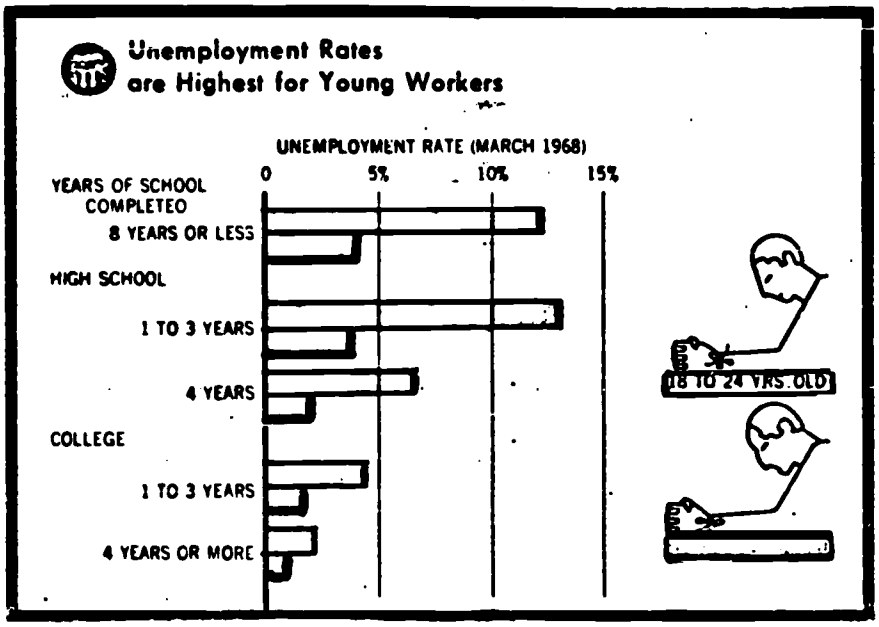
In semi-skilled employment, increases in production generated by rising population and rapid-economic growth as well as the increasing trend to motor truck transportation of freight are expected to be the major factors contributing to the increasing employment.

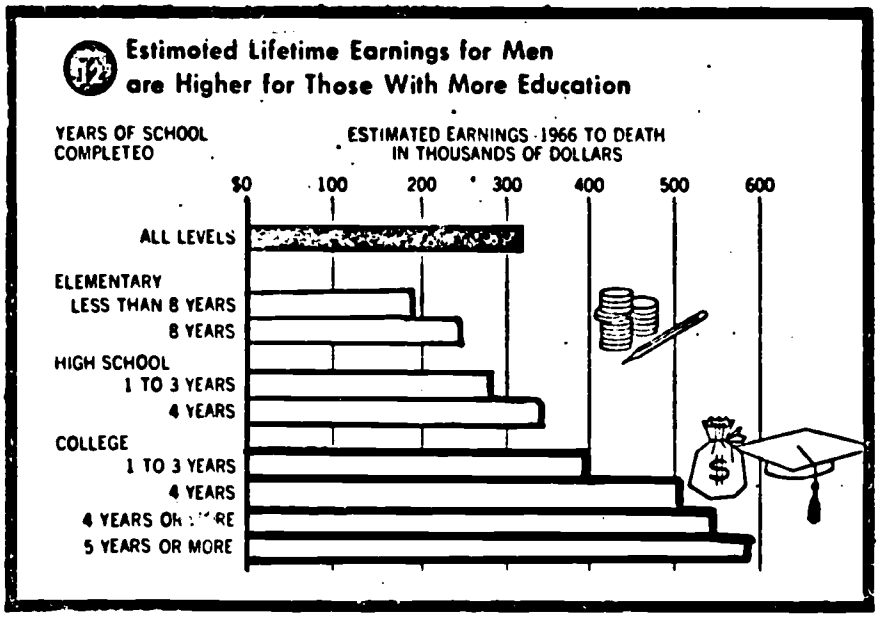
Employment of laborers is expected to change little in spite of the rises in manufacturing and construction which employ most laborers. Increased demand is expected to be offset by rising productivity resulting from continuing substitution of mechanical equipment for manual labor.

Service Worker Demand is Rapidly Expanding

Service workers, after professional workers, will be the fastest growing group because of such factors as rising demand for hospital and other medical care, the greater need for protective services as urbanization continues and cities become more crowded, and the more frequent use of restaurants, beauty parlors and other services as income levels rise and an increasing number of housewives take jobs outside the home.







A decrease is anticipated in farm workers, in part because of continued improvement in farm technology.

BAY REGION CAREER AREA GROWTH PROJECTIONS

1. The largest number of careers in the Bay Area will be in wholesale and retail trade and management, with good potential for careers at professional levels. This points to the need for further expansion of present management programs at the colleges.

2. Service industries is a large growth potential job area, particularly in the fields of allied health careers, transportation--both in moving people and in air freight--mental health and others. An emerging program in public service careers at Cañada College is an example of the college response to a growing new segment of career education. Increased development of the program is planned for the future.

3. Food and lodging technology and hospitality services will be increasingly needed as an age of recreation motivates more travel, lodging and restaurant use, and convention business is stimulated by the crossroads nature of the San Francisco Bay Region.

4. Increased automation gives rise to greater need for technicians to repair and service sophisticated computerized equipment and to operate numerically controlled production machines. Further expansion is indicated for computer programming and the data processing fields.

5. The concentration of electronic, engineering, aeronautic and aero-space production plants in the Bay Area will continue to be an area of opportunity for technical service careers including such fields as engineering and science technicians.

COMMUNITY COLLEGE RESPONSIBILITY AREA

TODAY'S DISTRIBUTION OF EMPLOYMENT -- SAN FRANCISCO BAY REGION, March 1971

	% of Total
Manufacturing	
Prof./tech	10
Managers, officials and proprietors	6
Clerical	12
Salesworkers	2
Craftsmen, foremen	19
Operatives	44
Service	2
Laborers	5
SFBR Total Jobs	318,200

Transportation, Communications Public Utilities	
Prof./tech	7
Managers	9
Clerical	25
Sales	1
Crafts	21
Operatives	27
Service	3
Labor	8
SFBR Total	151,900

Wholesale, Retail trade	
Prof/tech	2
Manager	21
Clerical	16
Sales	24
Crafts	7
Operatives	12
Service	14
Labor	4
SFBR Total Jobs	378,200

Service	
Prof./tech	31
Manager	7
Clerical	20
Sales	1
Crafts	6
Operatives	6
Service	30
Labor	2
SFBR Total Jobs	401,200

Above information taken from Department of Labor OCCUPATION OUTLOOK Bulletins, March 1971

Government	
Prof./tech.	37
Managers	6
Clerical	23
Sales	1
Crafts	7
Operatives	5
Laborers	18
Services	4
SFBR Total Jobs	339,400

Mining	
Prof./tech	10
Managers	8
Clerical	9
Sales	1
Crafts	26
Operatives	44
Service	1
Laborer	0
SFBR Total Jobs	1,000

Construction	
Prof/tech.	5
Managers	12
Clerical	6
Sales	1
Crafts	52
Operatives	10
Laborers	16
Service	1
SFBR Total Jobs	85,800

Finance, Insurance and Real Estate	
Prof./tech.	5
Managers	23
Clerical	46
Sales	18
Crafts	2
Operatives	1
Service	4
Laborers	2
SFBR Total Jobs	123,300

Total Distribution SFBR: 1,799,000

VOCATIONAL EDUCATION: SAN MATEO JUNIOR COLLEGE DISTRICT

EMPLOYMENT PATTERNS SAN FRANCISCO BAY REGION

San Francisco - Oakland - San Jose Labor Market

	% of Total Employment	March 1971	% of Change	March 1970
Employment Total - All Industries	100%	1,817,400		1,822,100
Agriculture	1%	13,200	- 6%	14,000
Contract Construction	5%	85,800	- 3%	88,400
Manufacturing (Total)	*17%	318,200	- 6%	340,500
Durable Goods: Primary Metals Fabricated Metals, Electrical Machinery, Auto Assembly, Shipbuilding	11%	194,900	- 8%	212,900
Non-Durable Goods: Food Processing, Apparel, Printing, Chemicals, Food Products	7%	123,300	- 3%	127,600
Services and Public Utilities	*30%	553,100	+ 1%	545,100
Services	22%	401,200	+ 2%	391,700
Public Utilities	8%	151,900	- 1%	153,400
Wholesale & Retail Trade	*21%	378,200	+ 1%	372,700
Wholesale	6%	105,800	+ 2%	103,300
Retail	15%	272,400	+ 1%	269,400
Government, Finance, Real Estate	*26%	462,700	+ 2%	455,200
Government	19%	339,400	+ 2%	334,300
Finance, Insurance, Real Estate	7%	123,300	+ 2%	120,900

*Major employment areas

SAN FRANCISCO BAY REGION
MAJOR EMPLOYMENT AREAS

	%-age of Employed Work Force
EMPLOYMENT AREA 1: SERVICES & PUBLIC UTILITIES Total in Bay Area: 545,200	30%

This includes hotels and other lodging places, personal services, which include laundries, dry cleaning, photograph studios, beauty shops, barber shops, shoe repair, funeral services and garment alterations and repair); miscellaneous services (including advertising, credit reporting and collection, duplicating, mailing and stenographic, janitorial services, news syndicates, private employment agencies, business services, automobile repair and service, appliance repair, motion picture houses, amusement and recreation places, medical and health services, legal services, museums, accounting, engineering and architectural services, communication and electric, gas and sanitary service, and non-profit organizations.

EMPLOYMENT AREA 2: GOVERNMENT, FINANCE & REAL ESTATE Total in Bay Area: 472,500	26%

Agencies of employment include Federal-State-County-City School districts, special districts, banking, other credit agencies, security and commodity brokers, insurance agents, real estate and investment companies.

EMPLOYMENT AREA 3: WHOLESALE & RETAIL TRADE Total in Bay Area: 381,600	21%

This includes wholesale and retail trade of all types, local passenger transportation, trucking and warehousing, water transportation, air transportation, pipeline transportation and other transportation services.

EMPLOYMENT AREA 4: MANUFACTURING (Total) Total in Bay Area: 309,000	17%

Products include ordnance and accessories, food and kindred products, textile mill products, apparel and related products, lumber and wood products, paper and allied products, printing and publishing, chemicals and allied products, petroleum and coal products, leather and leather products; stone, clay and glass products, primary metal industries, fabricated metal products, machinery and transportation equipment.

It is noteworthy that these four major employment areas constitute 94% of the employed work force. It would seem appropriate that our vocational education emphasis should reflect these percentages to a considerable degree.

COMPARISON OF PROJECTED NEEDS THROUGH THE 1980S WITH PRESENT PROGRAMS OF TRAINING IN THREE COLLEGES OF THE SAN MATEO DISTRICT

The best projection data available on job markets through the 1980s is provided by the U. S. Department of Labor, Bureau of Labor Statistics. This information is accepted as the most reliable by those who are responsible for planning and development in business, industry and government.

On the following pages the left-hand column provides information on projections in specific employment areas through the 1980s. The numbers indicate the new openings per year.

A second number--typewritten below DOL projections--is a projection for the number of jobs to be available each year in the San Francisco Bay Region. The number has been determined locally by comparing the California total work force with the numbers of workers in the Bay Region. It is estimated that a direct relationship is the best way to refine these projections for local use in planning and development.

The right-hand column lists the career education programs of the three colleges of the San Mateo College District. The column of numbers identified as enrollments are intended as an estimate of the number of workers that will enter this area of the employment market as the result of education provided by the colleges. These data calculations were obtained from class enrollment figures for fall semester 1971.

EMPLOYMENT OPPORTUNITIES AND CAREER EDUCATION NEEDS

SAN FRANCISCO BAY REGION TO 1980

Total SFBR Annual Openings to 1980: 51,288

Occupation	Estimated employment, 1968	Average annual openings to 1980	Employment prospects	San Mateo College District Career Education Programs	
PROFESSIONAL, TECHNICAL & RELATED OCCUPATIONS					
BUSINESS ADMINISTRATION AND RELATED PROFESSIONS		National (upper number) S.F. Bay (lower number)		Est. Enrollment Completions	
Accountants	500,000	33,000 759	Excellent opportunities. Strong demand for college trained applicants. Graduates of business and other schools offering thorough training in accounting should have good prospects.	38	Pre-professional programs are available on each campus to qualify students for specialization in Business Administration, Management and Supervision.
Advertising workers	140,000	5,700 131	Many young people attracted to this field. Hence, still competition, but good opportunities will continue for those having college-level training in marketing, journalism, or business administration and a flair for language.	7	
Marketing research workers	20,000	2,700 62	Very good opportunities for college graduates well prepared in marketing research methods and statistics. Marketing research organizations expected to expand, and many new ones will emerge.	3	Two-year community college business programs are designed to qualify students for employment in many areas of specialization.
Personnel workers	110,000	6,900 159	Favorable outlook. Opportunities best for college graduates. New workers needed for recruiting, interviewing, and related activities. More people will probably be engaged in psychological testing and labor-management relations.	8	
Public relations workers	100,000	8,800 202	Demand expected to grow as population increases and general level of business rises. Increases in amount of funds spent on public relations will continue.	10	
MANAGERIAL OCCUPATIONS					
Bank officers	125,000	9,900 228	Very rapid employment increase, as banks expand. However, competition keen, as banks rely on "promotion from within" to fill most positions.	11	Pre-professional programs are available which qualify students for transfer to upper division professional training.
Industrial traffic managers	15,000	500 12	Strong demand expected for specialists who know how to classify products to obtain the lowest possible freight rates, choose carriers best able to handle each shipment, and otherwise protect their companies from excessive shipping charges.		
Managers and assistants (hotel)	150,000	9,500 219	Moderate employment increase as additional hotels, motels, and motor hotels are built. Hotel administration graduates will have advantage.	10	Expansion is needed in management programs using programmed learning and televised courses to reach more students.
Purchasing agents	140,000	6,700 154	Very good opportunities. Demand strong for business administration graduates who have had courses in purchasing or engineering and science to work in firms manufacturing chemicals, complex machines, and other technical products.	8	

Occupation	Estimated employment, 1968	Average annual openings to 1980[1]	Employment prospects[2]
CLERICAL AND RELATED OCCUPATIONS			
Bank clerks	400,000	29,500 679	Moderate employment increase. Data processing will slow growth. Sharpest increases in clerical vocations related to data processing. Decline may occur in occupations such as check sorters and bookkeeping machine operators.
Bank tellers	230,000	20,000 460	Very rapid employment growth as banks expand services to urban population. Increasing proportion will be part-time tellers for peak hours.
Bookkeeping workers	1,200,000	78,000 1,794	Demand expected to outpace labor-saving impact of office machines.
Cashiers	730,000	69,000 1,587	Opportunities best for persons having typing, bookkeeping, or other special skills. Many opportunities for part-time workers.
Dental assistants	100,000	9,000 207	Excellent opportunities, especially for graduates of academic programs.
Electronic computer operating personnel	175,000	20,400 469	Although staff required to operate a computer installation may be reduced as new equipment is developed, total number of computer and auxiliary operators expected to increase very rapidly.
Front office clerks (hotel)	50,000	3,200 74	Moderate increase in employment as number of hotels, motels, and motor hotels increases.
Library technicians	70,000	9,000 207	Outlook excellent, particularly for graduates of academic programs. The continuous shortage of professional librarians contributes to very rapid growth.
Office machine operators	325,000	25,000 575	Rapid increase despite automated recordkeeping systems, advances in interoffice communications, devices for transmitting data, and electronic computer technology, which permit centralized recordkeeping.
Receptionists	240,000	30,000 690	Despite rapid increase, young applicants will face keen competition from older and more experienced workers. Unlikely to be affected by automation because work is of a personal nature.
Shipping and receiving clerks	370,000	12,400 285	Employment will not increase as fast as the volume of goods distributed. Laborsaving equipment enables large firms to handle a greater volume of merchandise, using fewer clerks.
Stenographers and secretaries	2,650,000	237,000 5,451	Very good opportunities. Increasing use of dictating, duplicating, and other office machines is not expected to affect growth greatly.
Telephone operators	400,000	28,000 644	Direct dialing and other automatic devices will offset employment impact of expanding business. Most growth will be in PBX installations where technological advances are minimal.
Traffic agents and clerks (civil aviation)	37,500	2,600 60	Rapid employment increase, mainly because of anticipated growth in air passenger and cargo traffic. Mechanization of reservation processing and recordkeeping will limit growth of clerical jobs.
Typists	700,000	63,000 1,449	Very good opportunities. Demand strongest for typists to do difficult work in senior jobs and for those combining typing and other office work.

San Mateo College District
Career Education Programs

Est. Enrollment Completions	
34	Two year community college business programs are designed to qualify students for employment in many areas of specialization.
23	
90	Cooperative Education opportunities are available in many office occupations.
80	
20	
35	All indications point to the need for expansion of educational programs in computer technology for many career areas.
25	
60	
45	A small number of courses using individual self-paced learning and programmed instruction would solve this need for training.
15	
225	Department of Employment personnel have stated that there is an unending need for first-rate secretarial and clerical workers
32	
5	
75	

Occupation	Estimated employment, 1960	Average annual openings to 1980[1]	Employment prospects[2]
SALES OCCUPATIONS			
Insurance brokers and agents	410,000	16,200 373	Field will remain keenly competitive despite expected increase in number of insurance policies issued.
Manufacturers' salesmen	500,000	32,000 736	Very good opportunities for well-trained workers, but employers will be selective. Demand strong for those trained to handle technical products.
Real estate salesmen and brokers	225,000	14,200 327	Many new positions will be created to serve growing population, but most openings will result from turnover.
Retail trade salesworkers	2,800,000	150,000 3,450	Many opportunities for full- and part-time work. Employment will increase more slowly than volume of sales. Most demand for workers who are well informed about their merchandise and skilled in salesmanship.
Automobile parts countermen	65,000	2,500 58	Continued employment growth related to increasing number of motor vehicles and a growing variety of replacement parts.
Automobile salesmen	120,000	4,400 101	Employment fluctuates, but tends to be more stable than car sales, which are affected by general business conditions, consumer preference, and availability of credit. Sales of new and used cars will increase as a result of increases in driving age population, multiple car ownership, and personal income.
Automobile service advisers	10,000	300 7	Complexity and larger number of cars expected to increase employment in this relatively small occupation.
Securities salesmen	135,000	7,400 170	Good opportunities. Many new and replacement openings for salesmen to serve growing number of individuals and institutions investing in securities.
Wholesale trade salesworkers	530,000	25,200 580	Good opportunities. Demand will be stimulated by increase in business transacted and specialized services offered by wholesale houses.
NATURAL SCIENCE OCCUPATIONS			
Geologists	22,800	800 18	Favorable prospects for persons who have graduate degrees; those with only the bachelor's degree, including those who rank high academically, will face some competition for the few available entry positions.
Geophysicists	6,800	300 7	Good job prospects especially for those having a graduate degree.
Meteorologists	4,000	200 5	Good opportunities. Space-age activities contributing to demand. Those with advanced degrees will be in special demand to conduct research, teach in colleges and universities, and engage in management and consulting work.
Oceanographers	5,200	500 12	Those with advanced degrees will have best opportunities. Growing recognition of importance of the oceans to the Nation's welfare and security has heightened interest in oceanography and has opened new fields for specialists.

San Mateo College District
Career Education Programs

Estimated Enrollment completions	
18	Pre-professional programs are available which qualify students for transfer to upper division professional training.
36	
25	A business curriculum with special emphasis in real estate prepares students for state examinations.
265	
8	
55	Evening college program could be expanded

Occupation	Estimated employment, 1969	Average annual openings to 1980	Employment prospects	San Mateo College District Career Education Programs Est. Enrollment Completions	
LIFE SCIENCE OCCUPATIONS					
Life scientists	170,000	9,900 228	Very good opportunities for graduate degree holders, particularly for research in medicine, health, and environmental quality control. Those having only a bachelor's degree may work as research assistants or technicians.	35	Pre-professional programs are available which qualify students for transfer to upper division professional training.
Biochemists	11,000	700 16	Very good prospects. Ph.D.'s will be in special demand to do independent research and teach. Greatest demand for medical research.		Two-year community college science programs are design to qualify students for employment in many areas of specialization.
PHYSICAL SCIENTISTS					
Chemists	130,000	8,800 202	Very good prospects, especially for those having advanced degrees, to teach and do research. Increased research and development expenditures will create new jobs. New products resulting from research also create other types of work.		Science Technicians are needed to work in many industries.
Physicists	45,000	3,200 74	Favorable opportunities, particularly for those having advanced degrees. Strong demand in teaching, research, and in various science and engineering programs.	35	
Astronomers	1,400	100 2	The higher level professional positions will continue to be filled mainly by persons having the doctorate. Well qualified persons having only a bachelor's or a master's degree will have good prospects primarily as research and technical assistants.		Medical science transfer programs are offered in pre-medical, pre-nursing, medical lab technician, physical therapy, dentistry dental hygiene, pre-veterin medicine and optometry.
HEALTH SERVICE OCCUPATIONS					
Physicians	295,000	20,000 460	Shortage occupation. Excellent opportunities. Limited capacity of medical schools restricts supply as demand increases steadily.	55	
Osteopathic physicians	12,000	800 18	Excellent job prospects. Greatest demand in areas where osteopathy is widely accepted method of treatment.		
Dentists	100,000	4,900 113	Very good opportunities. However, limited capacity of dental schools will restrict entrants.		
Dental hygienists	16,000	2,400 55	Demand will continue to exceed supply. Excellent opportunities, particularly for part-time workers.		
Dental labaratary technicians	27,000	2,100 48	Very good opportunities for well-qualified technicians and trainees. Best sources for salaried jobs are commercial laboratories and the Federal Government.	25	The AA degree program at CS qualifies students to take the State Board Examination for Registered Nurses.
Registered nurses	660,000	65,000 1,495	Current shortage, very favorable opportunities. Steadily rising demand accompanied by increasing supply, as training facilities and financial aid expand.	75	
Licensed practical nurses	320,000	48,000 1,104	Employment opportunities will increase rapidly as these workers are utilized to a greater extent to provide increasing nursing services.	45	The vocational nursing program at CSM prepares students to meet the qualifications for licensed vocational nurse.
Optometrists	17,000	800 18	Favorable prospects. Graduates of optometry schools expected to lag behind demand.	5	
Pharmacists	121,000	4,400 101	Graduaf increase in new positions anticipated.		
Podiatrists	8,500	200 5	Favorable opportunities for new graduates to establish their own practices as well as to enter salaried positions.		

Occupation	Estimated employment, 1980	Average annual openings to 1980	Employment prospects	San Mateo College District Career Education Programs Est. Enrollment completions	
Chiropractors	16,000	900 21	Outlook favorable; uncrowded field. Prospects will be best in areas where chiropractic is most fully accepted as a method of treatment.		
Occupational therapists	7,000	1,500 35	Shortage occupation. Public interest in rehabilitation of the disabled and the success of established therapy programs will continue to stimulate demand.	15	Excellent opportunities for jobs in Inhalation Therapy. Skyline College program.
Physical therapists	14,000	2,800 64	Excellent prospects. Demand expected to exceed supply, as rehabilitation services expand.		
Speech pathologists and audiologists	18,000	2,300 53	Good opportunities. Since most States require master's degree, trained applicants are in limited supply.		
Medical laboratory workers	100,000	12,800 294	Expanding opportunities as physicians increasingly depend upon laboratory tests in routine physical checkups as well as in the diagnosis and treatment of disease. Particularly strong demand for technologists having graduate training in biochemistry, microbiology, immunology, and virology.	25	Cooperative Education opportunities are available in many allied health training areas.
Radiologic technologists	75,000	7,300 168	Very good prospects for both full-time and part-time employment. Expansion in use of X-ray equipment in diagnosing and treating diseases strong factors underlying rise in demand.	10	Completion of the program in radiologic X-ray) technology at Cañada prepares students for the American Registry of Radiological Technologists examinations.
Medical record librarians	12,000	1,400 32	Shortage field; very good opportunities. More hospitals and increasing volume and complexity of hospital records will contribute to growing demand.		
Dietitians	30,000	2,700 62	Shortage occupation. Increasing opportunities for full-time and part-time work. Growth related to expansion of hospitals and nursing homes.	25	
Hospital administrators	15,000	900 21	Excellent prospects for those with master's degree in hospital administration. Applicants will have difficulty entering this field without graduate training.		
Sanitarians	10,000	600 14	Very favorable prospects as State and local health agencies expand activities in environmental health.		Expansion indicated
Veterinarians	24,000	1,400 32	Very good prospects. Although demand is expected to expand, supply will be restricted by limited capacities of schools of veterinary medicine.		
ENGINEERS	1,100,000	53,000 1,219	Very good opportunities. Applicants need to be well-grounded in fundamentals to avoid skill obsolescence.	75	Pre-professional programs are available which qualify students for transfer to upper division professional training. Long-range prospects are good. Engineers will work in many technical areas rather than intense specialization.
Aerospace	65,000	1,400 32	Favorable opportunities and moderate increase in requirements related to continuing developments in supersonic, subsonic, and vertical lift aircraft as well as advancement in space and missile activities.		
Agricultural	12,000	400 9	Moderate growth in demand stimulated by growing mechanization of farm operations, increasing emphasis on conservation of resources, and the broadening use of agricultural products and wastes as industrial raw materials.		

Occupation	Estimated employment, 1968	Average annual openings to 1980[1]	Employment prospects[2]	Est. Enrollment Completions	
Ceramic	10,000	400 9	Excellent opportunities for new graduates. Growth of programs related to nuclear energy, electronics, and space programs will provide many opportunities.		Cooperative education opportunities are available in many engineering technology career areas as with telephone communications, computer technology and others;
Chemical	90,000	1,400 37	Excellent opportunities. Growth factors related to expansion of the chemical industry and large expenditures for research and development.	15	
Civil	180,000	11,500 265	Expanding opportunities related to growing needs for housing, industrial buildings, and highway transportation systems. Work related to urban environmental problems such as air pollution may also require additional civil engineers.	15	
Electrical	230,000	12,500 288	Rapid growth related to demand for electrical equipment to automate and mechanize production processes, especially for items such as computers and numerical controls for machine tools and for electrical and electronic consumer goods.	15	A number of courses using individual self-paced learning and programmed instruction would be helpful in solving many needs
Industrial	120,000	7,200 166	Increasing complexity of industrial operations, expansion of automated processes, and continued growth of the Nation's industries are expected to increase demand.	8	
Mechanical	215,000	8,600 198	Rapid employment growth due to demand for industrial machinery and machine tools and increasing technological complexity of industrial machinery and processes.	10	
Metallurgical	6,000	300 7	Increasing number of workers will be needed to develop new metals and alloys as well as adapt current ones to new needs, and to solve metallurgical problems connected with efficient use of nuclear energy.		
Mining	5,000	100 2	Growing demand, to work with newly discovered mineral deposits and devise more efficient methods to mine low grade ores, as well as develop oil shale deposits.		
MATHEMATICS AND RELATED OCCUPATIONS				20	
Mathematicians	65,000	4,600 106	Favorable employment opportunities for those having graduate degrees and for well-qualified persons having bachelor's degrees.		
Statisticians	23,000	1,600 37	Good opportunities. Widespread application of statistical methods should strengthen demand in industry, government, and in colleges and universities.		
Actuaries	4,000	300 7	Excellent opportunities because of rising number of insurance policies. Qualified graduates who have passed some actuarial examinations will be in particular demand as trainees.		
TECHNICIANS					
Draftsmen	295,000	15,300 352	Favorable prospects, especially for those having post-high school drafting training. Well-qualified high school graduates in demand for some types of jobs.	35	Technology programs are available at CSM in drafting as well as in technical illustration.
Engineering and science technicians	620,000	31,000 713	Very good opportunities. Demand strongest for graduates of post-secondary technician training schools to fill more responsible jobs. Industrial expansion, complexity of products, and manufacturing processes increasing demand.	35	Technology programs are available at CSM in electronics, machine tools, manufacturing and welding.

Occupation	Estimated employment, 1968	Average annual openings to 1980	Employment prospects	San Mateo College District Career Education Programs Est. Enrollment Completions	
OTHER PROFESSIONAL, TECHNICAL & RELATED OCCUPATIONS					
Airline dispatchers	1,200	50 1	Little or no employment change as improved communication facilities enable dispatchers at major terminals to dispatch aircraft at other airports.		
Air traffic controllers	14,800	425 10	Moderate employment increase, despite greater use of automated equipment, as airline traffic increases.		
Architects	34,000	2,300 53	Good prospects in this rapidly growing field as volume of nonresidential construction expands. Demand will be stimulated also by urban redevelopment and city and community planning projects.	5	
Broadcast technicians	20,000	400 9	Slight increase in employment, despite technical advances, such as automatic switching and programming, automatic operation logging, and remote control of transmitters which limit job opportunities. Color television, which requires more maintenance and skill than black and white equipment, will increase demand.	10	Telecommunications technician program is available at CSM
College placement officers	2,500	200 5	Prospects best for recent college graduates seeking beginning positions, particularly at their own alma maters. College and university emphasis on the student personnel service aspect of higher education will increase demand.		
Commercial artists	50,000	1,900 44	Good opportunities for the talented and well trained. Young people having only average ability and little specialized training will encounter competition for beginning jobs and limited opportunities for advancement.	3	
Flight engineers	7,500	225 5	Rapid increase in employment as heavier jet-powered aircraft, requiring flight engineers, come into wider use.		
Ground radio operators and teletypists	8,200	225 5	Employment may decline somewhat because of more automatic communications equipment.		
Home economists	100,000	7,800 179	Greatest demand will be for teachers. Increased national focus on the needs of low-income families may also increase demand.	15	Home economics programs on each campus are proving to be valuable career development areas through cooperative education placements in business and merchandising.
Industrial designers	10,000	300 7	Employers will seek applicants with a college degree and outstanding talent. Entrants likely to encounter keen competition from creative persons with engineering, architectural, and related educational backgrounds.		
Interior designers and decorators	15,000	700 16	Good opportunities for talented graduates. Those having no formal training will find jobs increasingly difficult to obtain.		Liberal arts transfer programs at each campus prepare students for upper division career specialization
Landscape architects	8,500	500 12	Profession will expand because of continued growth of metropolitan areas with their needs for parks and recreational facilities, increasing public construction including housing, and rising interest in city and regional planning.		

Occupation	Estimated employment, 1968	Average annual openings to 1980[1]	Employment prospects[2]	San Mateo College District Career Education Programs Est. Enrollment Completions	
Lawyers	278,000	14,500 334	Very good prospects for graduates from widely recognized law schools and those who rank high in class. Others may encounter difficulty finding salaried jobs as lawyers. The increased use of legal services by low- and middle-income groups will add to the long-term growth in demand.	334	Pre-professional programs are available which qualify students for transfer to upper division professional training.
Librarians	108,000	8,200 189	Excellent prospects. Shortages, particularly in school libraries, expected to continue despite anticipated increase in number of library school graduates.	20	
Models	80,000	1,700 39	Full-time modeling should remain highly competitive. Favorable part-time opportunities.		
Photographers	80,000	2,200 51	Competition keen in portrait and commercial fields, but demand will continue strong for industrial photographers.	5	
Pilots and copilots	52,000	1,800 41	Very rapid increase in employment to the extent that increased traffic exceeds increased carrier capacity.	5	Specialized aeronautics curriculum is available at CSM for preparation for commercial pilot
Programmers	175,000	23,000 529	Sharpest employment increase in firms using computers to process business records and control manufacturing processes. Changes in job function related to advances in technique and equipment will eliminate much routine work. Increasing demand for qualified programmers and systems analysts in science and engineering programs.	25	All indications point to the need for expansion of educational programs in computer technology for many career areas.
Psychologists	32,000	3,100 71	Excellent opportunities for those having a Ph.D. Competition likely to be keen for those having an M.A. Expansion of health services, counseling, testing, and teaching will contribute to demand.	2	
Radio and television announcers	14,000	600 14	Moderate increase in employment as new radio and television stations open; however, automatic programming will limit growth. Entry jobs easier to get in radio than in television because of the greater number of radio stations, especially small ones, that hire beginners.	5	Telecommunications production program is available at CSM
Recreation workers	40,000	4,100 94	Current shortage. Excellent opportunity for well-qualified workers, particularly in local governments, voluntary agencies, hospitals, and youth-serving organizations.	5	
Social workers	160,000	16,700 384	Excellent opportunities for those having master's degree in social work; very good opportunities for those having a bachelor's degree. Many part-time jobs for qualified and experienced women.	15	Pilot programs in public service careers are developing and need expansion.
Surveyors	45,000	2,600 60	Best prospects for persons having post-secondary school training in surveying. Demand will be stimulated by expanding urban and highway development.	5	
Systems analysts	150,000	27,000 621	Excellent opportunities; one of fastest growing professions. Qualified workers difficult to obtain because of competition from other fields, especially mathematics and science.	20	
Urban planners	7,000	800 18	Shortage of qualified planners in this small, rapidly growing field. Very good prospects with government in health planning, model cities programs, and intergovernment planning relations.	2	

Occupation	Estimated employment, 1963	Average annual openings to 1980	Employment prospects	San Mateo College District Career Education Programs Est. Enrollment Completions	
CONSERVATION OCCUPATIONS					
Foresters	25,000	1,000 23	Good opportunities. Factors contributing to increased demand are expanded need for forest products; use of forests for recreational purposes; and growing awareness of need to conserve and replenish our forest resources.	10	
Forestry aids	13,000	900 21	Prospects will be especially good for those with post-high school training in a forestry curriculum.		
Range managers	4,000	200 5	Favorable opportunities, particularly in Federal agencies. Demand will be especially good for well-qualified persons having advanced degrees to fill research and teaching positions.		
SOCIAL SCIENTISTS				20	
Anthropologists	3,000	200 5	Excellent opportunities for Ph.D.'s. Those with only the master's likely to face persistent competition.		Cooperative education opportunities are available in many social service careers.
Economists	31,000	2,200 51	Excellent opportunities for those having graduate degrees, particularly in teaching and research. Applicants having B.A. degrees will find many opportunities in government and as management trainees in industry.		
Geographers	3,900	200 5	Favorable outlook. Strong demand in teaching and research for those with graduate degrees. Government needs are related to regional development, urban and resource management planning, and interpretation of maps.		
Historians	14,000	800 18	Excellent opportunities in teaching and archival work for Ph.D.'s. Those with only a master's or less will find positions scarce; high school teaching available for those meeting certification requirements.		
Political scientists	11,400	800 18	Very good prospects, especially for Ph.D.'s interested in college teaching. More limited prospects for those having only a master's or less. Demand in government for work related to foreign affairs.		
Sociologists	10,000	600 14	Majority of new positions will be in teaching. Best opportunities for Ph.D.'s. Very good opportunities for research workers in rural sociology, community development, population analysis, public opinion research, and medical sociology.		
TEACHERS					
College and university teachers	286,000	17,000 391	Good opportunities, especially for Ph.D.'s; many opportunities, particularly in junior colleges, for those having master's degrees. Shortages likely in some subject fields.		
Kindergarten and elementary school teachers	1,230,000	56,300 1,295	Number of qualified teachers may exceed openings if present enrollment projections and trends in number of newly trained teachers continues. Greater emphasis expected to be placed on quality of applicant's training and academic achievement.	75	Long-range potential remains good.

Occupation	Estimated employment, 1968	Average annual openings to 1980	Employment prospects[a]
Secondary school teachers	940,000	40,000 920	A slowing of enrollment growth may be accompanied by an increase in college graduates trained to teach. Greater emphasis expected to be placed on type and quality of an applicant's training and academic achievement. Demand may exceed supply in some geographical areas and in some subjects.
PERFORMING ARTISTS			
Actors and actresses	14,000	900 21	Overcrowding to persist. Applicants outnumber many times the jobs available. Moreover, many actors are employed in their profession for only a small part of the year.
Dancers	23,000	1,000 32	Few full-time jobs and large number of applicants. Outlook for those qualified to teach will be much better than for those trained only as performers.
Musicians and music teachers	166,000	8,600 198	Overcrowded field. Keen competition for performers; prospects brightest for teaching. Slight employment increase expected.
Singers and singing teachers	61,000	3,100 71	Keen competition for performers. Better chances for teachers. Little growth likely.
COUNSELING OCCUPATIONS			
Employment counselors	5,300	700 16	Excellent opportunities for those having a master's degree or recognized experience in the field. College graduates with a bachelor's degree and 15 hours in counseling courses will find many opportunities as trainees in State and local employment service offices.
Rehabilitation counselors	12,000	1,050 24	Shortage occupation; excellent opportunities particularly for persons having graduate training in rehabilitation counseling or in related fields.
School counselors	54,000	3,800 87	Shortage area. Excellent opportunities. Very rapid employment increase, reflecting continued strengthening of counseling services and some increase in secondary school enrollments.
SERVICE OCCUPATIONS			
Cooks and chefs	670,000	48,000 1,104	Excellent opportunities. Small establishments offer most opportunities for beginners. Acute shortage of skilled cooks and chefs.
Cosmetologists	475,000	38,000 874	Very good opportunities. Employment will rise because of increase in population and more frequent use of beauty salons.
FBI special agents	6,500	(?)	Employment expected to rise with growing FBI responsibilities. Turnover rate traditionally low.
Firefighters	193,000	7,700 177	Many new jobs created, as city fire departments enlarge staffs and as paid firefighters replace volunteers.
Licensed practical nurses	320,000	48,000 1,104	Opportunities will increase rapidly as these workers are utilized more commonly to fill demand for nursing services.
Hospital attendants	800,000	100,000 2,300	Very rapid rise in employment. Most openings will be in hospitals, but many will be in nursing and convalescent homes and other long-term care facilities.

San Mateo College District
Career Education Programs
Est. Enrollment
Completions

48

20

35

45

10

35

50

Two-year community college service career programs are designed to qualify students for employment in many areas of specialization

Cooperative education opportunities are available in most service career areas.

San Mateo College District
Career Education Programs
Est. Enrollment
Completions

Occupation	Estimated employment, 1968	Average annual openings to 1980[1]	Employment prospects[2]	
Housekeepers and assistants (hotel)	25,000	2,400 55	Increase in employment related to growing number of hotels, large motor hotels, and luxury motels. Established hotels fill most openings by promoting assistant housekeepers and maids.	
Police officers (municipal)	285,000	15,000 345	Very good opportunities although future jobs are likely to be affected by current changes in police methods and equipment. Specialists becoming more essential.	45
Private household workers	1,700,000	121,000 2,783	Large number of openings. Demand stimulated by rising family incomes and larger number of women working outside the home.	
State police officers	35,000	2,800 64	Opportunities excellent. Number of applications restricted in some States by State Civil Service and other entry requirements.	5
Stewardesses (civil aviation)	25,000	(3)	Very rapid increase expected because of more air travel and high turnover; 30 percent of stewardesses leave jobs each year.	20
Waiters and waitresses	960,000	67,000 1,541	Employment will increase rapidly despite growth in use of vending machines.	
[redacted]				
BUILDING TRADES				
Asbestos and insulating workers	22,000	800 18	Moderate employment increase as construction expands and industrial pipe is used more widely in manufacturing.	
Bricklayers	175,000	7,600 175	Moderate employment increase, as construction expands and more structural and ornamental brick is used.	
Carpenters	869,000	39,300 904	Moderate employment increase resulting from large rise in construction activity, but growth will be limited by technological developments.	
Cement masons (cement and concrete finishers)	60,000	3,600 83	Rapid employment increase resulting from rapid expension of construction and growing use of concrete and concrete products.	
Electricians (construction)	190,000	10,500 242	Very rapid increase in employment expected in construction requiring electrical wiring for appliances, air-conditioning systems, electronic data processing equipment, and electrical control devices.	
Elevator constructors	14,500	500 12	Slow employment increase. Some workers needed as industrial and commercial building activity expands and old structures are modernized.	
Floor covering installers	37,000	1,700 39	Moderate employment increase resulting from expansion of construction activity and wider use of resilient floor coverings and wall-to-wall carpeting.	
Glaziers	9,000	500 12	Very rapid increase in employment. Expansion of construction activity and the increasing use of glass in building construction will create very favorable long-range outlook.	
Lathers	30,000	1,250 29	Moderate increase related to anticipated growth in construction and to new kinds of plaster that require lathing.	
Operating engineers (construction machinery operators)	285,000	16,200 373	Very rapid employment growth resulting from increasing use of machinery for construction, particularly for highways.	

Estimated that 150 students of 3 colleges enter building trades per year

San Mateo College District
Career Education Programs
Estimated Enrollment completions

Occupation	Estimated employment, 1968	Average annual openings to 1980	Employment prospects	
Painters and paperhangers	430,000	23,200	Expected increase in construction points to moderate employment increase for painters. Painters also needed in maintenance and in use of such new materials as polyester and vinyl coatings and epoxys. Moderate employment increase for paperhangers because of wider use of fabric, plastic, and other wall coverings. Use of interior wall paint and wallpapers for "do-it-yourselfers" will limit growth.	534
Plasterers	40,000	1,150	Moderate increase resulting from growth in construction. New materials and methods have expanded use of plaster; but drywall construction will limit employment growth.	26
Plumbers and pipefitters	330,000	19,500	Rapid growth, as construction increases. Maintenance, repair, and modernization of existing plumbing and heating systems will create additional jobs.	449
Roofers	55,000	3,000	Rapid increase resulting mainly from construction growth. Technological innovations may limit growth somewhat.	69
Sheet-metal workers	50,000	2,500	Very rapid increase, due to expansion of construction that will use air-conditioning and refrigeration systems.	58
Stonemasons, marble setters, tile setters, and terrazzo workers	30,000	850	Little employment increase for stonemasons, due to decline of stonemasonry in modern architecture. Little change for marble setters. Moderate increase for tile setters, limited by increasing use of competing materials. Rapid increase for terrazzo workers due to expanding use of terrazzo materials.	20
Structural-, ornamental-, and reinforcing-iron workers; riggers; and machine movers	75,000	3,900	Rapid increase, as a result of expected growth of construction and because metals are expected to become more competitive with other building materials.	90
MACHINE OCCUPATIONS				
All-round machinists	400,000	12,600	Slow employment increase, with most openings resulting from need for replacements.	290
Setup men (machine tools)	70,000	2,600	Moderate increase, as a result of anticipated expansion of metalworking activities. Numerically controlled machine tools may change job duties.	60
Tool and die makers	150,000	3,700	Despite technological advances in toolmaking, employment is expected to increase slowly because of anticipated long-range expansion of metalworking industries.	85
MECHANICS AND REPAIRMEN				
Air-conditioning, refrigeration, and heating mechanics	100,000	5,000	Continued fast growth of home air-conditioning will contribute to very rapid employment increase for air-conditioning mechanics. Oil burner mechanics may find openings limited, since relatively few new homes have oil heating systems.	115
Aircraft mechanics	135,000	9,700	Rapid increase due to substantial increase in the number of aircraft in operation.	223

20

Technology programs are available at CSM in electronics, machine tools, manufacturing and welding.

Estimate that 250 students from 3 colleges enter mechanics and repair careers each year.

Occupation	Estimated employment, 1968	Average annual openings to 1980[1]	Employment prospects[2]
Appliance servicemen	295,000	8,800 198	Rapid increase because of the larger number of household appliances. Increased efficiency of service will limit growth.
Automobile body repairmen	100,000	3,550 82	Moderate increase, primarily as a result of growing number of motor vehicle accidents.
Automobile mechanics	615,000	20,000 460	Moderate increase as a result of more automobiles and their new features such as air-conditioning, power steering, power brakes, and devices that reduce exhaust fumes. Greater shop efficiency will limit growth.
Bowling-pin machine mechanics	6,500	50 1	Little or no employment change. Despite growing popularity of bowling, improvements in manufacture of pinsetting machines result in fewer repairs.
Business machine servicemen	115,000	8,500 196	Outlook particularly favorable for those who have good mechanical ability and knowledge of electricity or electronics.
Electric sign servicemen	6,100	300 7	Rapid increase despite trend toward illuminated plastic signs.
Farm equipment mechanics	40,000	1,100 25	Slow increase due to declining number of farms and increased reliability of farm machinery.
Industrial machinery repairmen	175,000	7,550 174	Moderate increase as result of anticipated use of more machinery and equipment to fabricate, process, assemble, inspect, and handle industrial production materials.
Instrument repairmen	85,000	4,600 106	Very rapid increase because the use of instruments for scientific, industrial, and technical purposes will increase.
Maintenance electricians	240,000	9,900 228	Moderate increase because of growing volume of electrical and electronic equipment.
Millwrights	75,000	2,400 55	Slow increase, related to new plants, additions of new machinery, changes in plant layouts, and maintenance of increasing amounts of heavy equipment.
Television and radio service technicians	125,000	3,000 69	Moderate increase related to growing number of radios, television receivers, phonographs, and other home entertainment products.
Truck mechanics and bus mechanics	110,000	2,900 67	Moderate increase resulting from more freight transportation by truck. Favorable effect of increased intercity bus travel is expected to be offset by declining local bus transit.
Vending machine mechanics	16,000	650 15	Moderate increase of qualified mechanics, resulting from expansion of automatic merchandising.
Watch repairmen	20,000	1,400 32	Inadequate supply of skilled workers expected to continue. Well-trained workers in demand to produce miniaturized devices, especially in industries making scientific instruments and electronics.
PRINTING (GRAPHIC ARTS) OCCUPATIONS			
Bookbinders and related workers	30,000	400 9	Some employment decrease despite anticipated growth of bound printed material, because of increasing mechanization of bindery operations.

San Mateo College District
Career Education Program
Est. Enrollment
completions

Cooperative education opportunities are possible in many technical careers.

Estimate that 50 students from 3 colleges enter printing and related fields per year.

Occupation	Estimated employment, 1988	Average annual openings to 1988[1]	Employment prospects[2]
Composing room occupations	190,000	3,200 74	Slow decline caused by technological changes, despite greater volume of printing. Knowledge of electronic principles increasingly important for operation of new typesetting equipment.
Electrotypers and stereotypers	8,000	—25	Moderate decline caused by technological change, despite increased printing volume.
Lithographic occupations	73,000	1,800 41	Slow increase despite expansion of offset printing. Technological developments expected to slow employment increase.
Photoengravers	18,000	300 7	No increase despite growing use of photographs and other illustrations and increasing use of color. Technological change in etching and engraving and greater use of offset printing will limit growth.
Printing pressmen and assistants	90,000	2,850 66	Moderate increase as volume of printing and use of color expands, requiring larger and more complex presses. Technological improvements will limit growth.
TELEPHONE INDUSTRY OCCUPATIONS			
Central office craftsmen	80,000	2,700 62	Moderate employment increase, resulting mainly from greater demand for telephone service and data communication systems. Electronic and automatic devices will restrict growth.
Central office equipment installers	22,000	400 9	No change in employment; however, increasingly complex central office equipment will require manpower having more and higher skills in electronics.
Linemen and cable splicers	40,000	600 14	Trends will differ among individual occupations. Very small growth is expected in number of cable splicers because of technological developments that increase worker efficiency. Employment of linemen not expected to increase significantly because of increased mechanization.
Telephone and PBX installers and repairmen	86,000	3,000 69	Moderate increase. Growing number of telephones and specialized equipment expected to cause some growth in volume of service.
OTHER OPERATIVE OCCUPATIONS			
Assemblers	785,000	26,000 578	Slow increase in employment as technological developments curb growth. Many replacements needed, however.
Automobile painters	30,000	1,200 28	Moderate increase resulting from larger number of motor vehicle accidents.
Brakemen (railroad)	74,000	1,000 23	Declining employment as railroad yards become more mechanized. Some replacement opportunities.
Electroplaters	13,000	600 14	Moderate increase, related to long-run expansion in metalworking and machinery industries and use of electroplating processes on more metals and plastics. Continuing mechanization and reassignment of duties to other workers will limit growth.
Gasoline service station attendants	400,000	10,900 251	Moderate increase resulting from growing consumption of gasoline and other service station products and services.

San Mateo College District
Career Education Programs
Est. Enrollment
Completions

Two year community college business programs are designed to qualify students for employment in many areas of specialization.

20

Cooperative education opportunities are available in many technical, engineering and scientific career areas.

Estimate that 250 students from 3 colleges enter Other Operative occupations per year.

Occupation	Estimated employment, 1988	Average annual openings to 1988[1]	Employment prospects[2]
Inspectors (manufacturing)	585,000	19,200 442	Slow increase. Use of mechanized and automatic inspection equipment will offset rising need for inspectors.
Machine tool operators	300,000	10,500 242	Little change despite anticipated expansion of metalworking activi-
Photographic laboratory occupations	30,000	1,600 37	Moderate increase tied to growth of amateur, business, and government photography. However, greater use of improved mechanized film processing equipment will keep employment from growing as fast as volume of processing.
Waste water treatment plant operators	23,500	2,500 58	Rapid increase as result of construction of new treatment plants for industrial and domestic waste water.
Welders and oxygen and arc cutters	480,000	23,000 527	Rapid increase as a result of favorable long-run outlook for metalworking industries and wider use of welding.

San Mateo College District
Career Education Programs
Est. Enrollment
Completions

A small number of courses using individual self-paced learning and programmed instruction would solve this need for training.

STATEMENTS FROM A POSITION PAPER ON OCCUPATIONAL EDUCATION by the Regents of the University of the State of New York

In the paper, prepared in May of 1971, the Regents noted, "The fundamental need is for an occupational education system as comprehensive and flexible as the society it serves is complex and changing."

The Regents' observed that "Programs are needed to prepare workers for jobs which exist and are emerging and to enable those already in the labor force to maintain job security even as occupational requirements change."

Further, they observed:

> ...Since students will not only be preparing for jobs which exist or are emerging, but for jobs of the future, whose nature cannot always be foreseen, occupational education will need to place increased emphasis on developing general learning ability as well as specific skills. More than ever before it will function as a means for learning to use the arts and sciences in real life situations, and as a source of and motivation for other forms of learning, rather than a substitute for them.
>
> To serve all people, occupational education must be a part of a macroeducational system which recognizes the career implications of all education and the educational nature of all experience, and which therefore minimizes "credentialism," or the idea that the only true path to success and happiness is an education leading to a traditional 4-year degree or beyond. The need is evident for an educational system containing multiple avenues to success and happiness.
>
> ...While it can be distinguished from other components of the educational process by its emphasis on developing job skills, occupational education functions as part of the total process in developing the many characteristics needed for personal, social, and occupational success. Besides developing specific job skills, occupational education provides orientation....

...The time is past when any secondary educational program could be regarded or designed as terminal. Already, increasing numbers of workers are facing the need to retrain several times in a lifetime, and this trend can be expected to accelerate along with industrial change. Many new and emerging technical and service occupations require preparation beyond the secondary level. Accordingly, underlying this paper is the assumption that in addition to preparing students for immediate employment, all secondary occupational education programs will provide the basis for continuation of education and training, either immediately after graduation, or as the desire or need arises.

Any student will be able to choose an occupational education program with assurance that he is increasing his buture options, if:

- there is a strong bond between occupational and academic education, so that students completing occupational programs have sound backgrounds in both occupational and basic educational skills.
- the trend continues toward preparation of secondary, and community college students for work in families or broad clusters of occupations, rather than for specific jobs alone.
- the scope of occupational education at the secondary and community college level continues to broaden, so that students with a wide range of interests and abilities are able to obtain preparation for occupations of their choice.
- more programs are specifically designed to prepare occupational education students for continued study at the post-secondary level, and articulation between programs at the two levels increases.
- occupational programs are relevant, in the sense that they prepare students for occupations in which employment opportunities exist or are emerging, and reflect the actual requirements for entering and succeeding in those occupations.
- all students electing occupational programs have reasonable assurance of employment upon completion. This assumption implies that every occupational education agency, including community colleges, will either act as an employment service in placing its own graduates, or facilitate placement through effective relationships with existing employment services.
- all barriers are eliminated which prevent any persons, such as members of racian minority groups, from enjoying equal opportunity for employment and career advancement.

CALIFORNIA STATE PLAN FOR VOCATIONAL EDUCATION

The general administrative organization for federally aided vocational education in California and operational policies, procedures, and responsibilities includes:

1.1 State Board. The State Board of Education is the sole agency in California responsible for the administration of the California State Plan for Vocational Education and for the supervision of its administration in local educational agencies. Any reference in this plan to "the Board" or "the State Board" means the California State Board of Education.

1.13 Authority of State Board. The State Board is vested with all necessary power and authority to submit this state plan and to administer its provisions. Legal provisions for such authority in the Education Code are:

6254. The State Board of Education is designated as the state board to carry out the purposes and provisions of the acts of Congress, and is given all necessary power and authority to cooperate with the Federal Board for Vocational Education in the administration of the provisions of the federal acts and of this article (commencing at Section 6251).

18601. Whenever by the provisions of any act of Congress the act is to be administered in the State by the Superintendent of Public Instruction, Director of Education, Department of Education, State Board of Education, or any one or more of such officers, or agencies, the officers and agencies designated in the act of Congress are authorized to administer the act in the State. Such officers or agencies are vested with all necessary power and authority to cooperate with the government of the United States or any agency or agencies thereof in the administration of the act of Congress and rules and regulations lawfully adopted thereunder.

1.13-1 Community Colleges. Assisting the State Board in its general responsibilities for federally aided vocational education is the Board of Governors of the California Community Colleges to which the State Board has delegated certain functions and responsibilities. Chapter 1.5 of the Education Code makes provisions for the Board of Governors of the California Community Colleges.

3.14 Manpower Needs and Job Opportunities. The local educational agency will develop plans and prepare applications for funds based on current and emerging manpower needs and job opportunities. The local educational agency is responsible for consulting with local advisory committees composed of employer-employee representatives, the State Department of Human Resources Development, as specified in the agreement between the State Board and that agency, and with other knowledgeable persons.

The allocation of funds to local educational agencies will be based upon information regarding current and projected manpower needs and job opportunities. Each application, as required in Section 3.26 of this state plan, must include consideration of projected manpower needs and job opportunities as related to each vocational education program for which funds are requested. The absence or inadequacy of such information will invalidate the eligibility of the applicant for such funding.

Analyses of labor market data coupled with data from other sources will be used to identify current and projected manpower needs and job opportunities on a regional and statewide basis.

The State Board and the Board of Governors will identify current and projected manpower needs and job opportunities as outlined by the California Manpower Coordinating Committee. This committee represents the following state agencies with responsibility for various aspects of educational training: Department of Human Resources Development, Department of Industrial Relations, Governor's Office of Economic Opportunity, Department of Rehabilitation, Department of Social Welfare, and Department of Education.

The eligibility and priority of each application will be based upon the adequacy of the information of the following types:

(a) Information and Current Occupations. Securing local labor market information on job opportunities for men and women in occupations is of highest priority. Information on entry-level jobs for youth who have no more than a high school education, or who are dropouts, including data on minimum abilities required by employers, constitutes a special need. Predictions of job opportunities are needed for short-range (up to five years) and long-range (up to ten years) bases.

(b) Information on New and Changing Occupations. Information is needed on new types of occupations that will be available in five years and ten years, and information on occupations and jobs that will change significantly in five years and ten years.

(c) Information About Educational Training and Requirements. Information is needed about training necessary for professional, technical, and highly-skilled and semi-skilled jobs. Information of this kind should be related to academic, technical, and personal qualifications.

(d) Information on Occupations and Families of Occupations Requiring Similar Patterns of Abilities and Interests. Information is needed that relates to occupational characteristics to personal characteristics and that expedites mobility of workers, horizontally and vertically, as conditions change.

(e) Information on Long-term Trends in Major Occupations and Industries. Projections of industrial and business growth should be given by regions or areas, considering taxes, availability of workers, land values, transportation, and other factors that attract or repel business.

(f) Information Identifying Specific Occupations That Will Employ Large Numbers of Workers, Male and Female, in the Future. Information is needed on major occupations in terms of numbers employed in each for the next five or ten years and the percent of the work force estimated to be employed.