DOCUMENT RESUME

ED 303 682 CE 051 984

AUTHOR Budke, Wesley E.
TITLE Trends and Issues in Vocational Education 1988. Information Series No. 334.
INSTITUTION ERIC Clearinghouse on Adult, Career, and Vocational Education, Columbus, Ohio.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 88
CONTRACT RI88062005
NOTE 37p.
AVAILABLE FROM Publications Office, Center on Education and Training for Employment, 1900 Kenny Road, Columbus, OH 43210-1090 (Order No. IN334: $4.75).
PUB TYPE Information Analyses - ERIC Information Analysis Products (071)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Access to Education; Basic Skills; Economic Factors; Educational Change; *Educational Trends; *Employment Patterns; Equal Education; Futures (of Society); *Job Training; *Population Trends; Postsecondary Education; Secondary Education; Sociocultural Patterns; *Technological Advancement; *Vocational Education

ABSTRACT

Vocational education providers need knowledge of trends and critical issues in order to prepare workers for the future. The context of vocational education and training programs is greatly influenced by social, economic, and technological forces to which they must respond. Among the most important social trends are the following: (1) increase in minority populations; (2) increase in nontraditional families; (3) aging of the population; (4) changes in life-style; and (5) changes in the culture of the workplace. Technological forces having an impact on vocational education include changes in skills and skill levels of workers resulting from technological changes and the transformation of the workplace into a learning environment. Related economic trends are the change from a manufacturing to a service economy, increased international competition, and growth of small businesses. Three major trends in vocational education have emerged in the 1980s: an impetus for reform; changing administrative and instructional roles; and access to vocational education. Within the framework of these broader trends are specific issues confronting vocational educators, in such areas as at-risk populations, teacher preparation, basic skills improvement, dropout prevention, program articulation, public-private sector linkages, technology as an instructional medium and as subject matter, emphasis on higher-order thinking skills, academic credit for vocational education, and vocational education at the elementary school level. (Includes 62 references.) (SK)

Information Series No. 334

TRENDS AND ISSUES IN VOCATIONAL EDUCATION 1988

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1988

FUNDING INFORMATION

Project Title:	ERIC Clearinghouse on Adult, Career, and Vocational Education
Contract Number:	RI88062005
Act under Which Administered:	41 USC 252 (15) and P.L. 92-318
Source of Contract:	Office of Educational Research and Improvement U.S. Department of Education Washington, DC 20208
Contractor:	The Center on Education and Training for Employment The Ohio State University Columbus, Ohio 43210-1090
Executive Director:	Ray D. Ryan
Disclaimer:	This publication was prepared pursuant to a contract with the Office of Educational Research and Improvement, U.S. Department of Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official U.S. Department of Education position or policy.
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This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under Contract No. RI88062005. The opinions expressed in this report do not necessarily reflect the position or policies or OERI or the Department of Education.

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FOREWORD

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is 1 of 16 clearinghouses in a national information system that is funded by the Office of Educational Research and Improvement (OERI), U.S. Department of Education. This paper was developed to fulfill one of the functions of the clearinghouse--interpreting the literature in the ERIC database. This paper should be of interest to anyone seeking an overview of current issues and recent developments in the field of vocational education.

ERIC/ACVE would like to thank Wesley E. Budke for his work in the preparation of this paper. Dr. Budke is Assistant Director and Vocational Education Specialist of ERIC/ACVE and Associate Professor in the Department of Agricultural Education, The Ohio State University. In 20 years of experience in vocational education, his roles have included teacher, teacher educator, director of research projects, and manager of information systems, including the Resources in Vocational Education and Vocational Education Curriculum Materials databases. He also served as Managing Editor of the *Journal of Vocational Education Research* and in 1988 as President of the American Vocational Education Research Association.

The following people are also acknowledged for their critical review of the manuscript prior to publication: Melvin Miller, Director of the School of Occupational and Adult Education, Oklahoma State University; James Pershing, Associate Professor of Instructional Systems Technology, Indiana University; Joan McFadden, Professor of Home Economics and Consumer Education, Utah State University; James P. Greenan, Professor of Vocational and Technical Education, Purdue University; Susan Klein, Clearinghouse Monitor, OERI; and Morgan Lewis, Research Scientist; Mark Newton, Associate Director; William Hull, Senior Research Specialist; and Wayne Schroeder, Senior Research Specialist, the Center on Education and Training for Employment.

Dr. Budke coordinated publication development with editorial assistance from Sandra Kerka. Janet Ray served as word processor operator, and editorial review was provided by Judy Balogh.

Ray D. Ryan
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EXECUTIVE SUMMARY

Knowledge of trends and critical issues in vocational education provides direction for the development of programs and policy. The challenge facing vocational educators is to develop a qualified labor force through high quality, accessible, and equitable education. The necessary background for awareness of trends and issues is an understanding of the vocational education and training enterprise. This huge and diverse enterprise includes (1) publicly supported vocational education and training programs offered through secondary and postsecondary institutions, military job training, and Job Training Partnership Act programs and (2) private sector training offered by business and industry and proprietary schools.

The context of vocational education and training programs is greatly influenced by social, economic, and technological forces to which they must respond. Among the most important social trends are the following:

- o Increase in minority populations
- o Increase in nontraditional families
- o Aging of the population
- o Changes in life-style
- o Changes in the culture of the workplace

Technological forces having an impact on vocational education include changes in skills and skill levels of workers resulting from technological changes and the transformation of the workplace into a learning environment. Related economic trends are the change from a manufacturing to a service economy, increased international competition, and growth of small businesses.

Three major trends in vocational education have emerged in the 1980s:

1. An impetus for reform
2. Changing administrative and instructional roles
3. Access to vocational education

Within the framework of these broader trends are specific issues confronting vocational educators: at-risk populations, teacher preparation, basic skills improvement, dropout prevention, program articulation, public-private sector linkages, technology as an instructional medium and as subject matter, emphasis on higher-order thinking skills, academic credit for vocational education, and vocational education at the elementary school level.

Information on vocational education trends and issues may be found in the ERIC system using the following descriptors: Access to Education, Basic Skills, Economic Factors, Educational Change, *Educational Trends, *Employment Patterns, Equal Education, *Job Training, *Population Trends, Postsecondary Education, Proprietary Schools, Secondary Education, Sociocultural Patterns, *Technological Advancement, *Vocational Education. Asterisks indicate descriptors having particular relevance.

INTRODUCTION

Planning and delivering education and training is a dynamic process. Constant program adjustments are necessary to respond to national and international social, economic, and technological forces impinging upon the educational system and the workplace. The challenge is to train a qualified and motivated labor pool through high quality, accessible, and equitable education for an increasingly diverse population.

This paper briefly reviews the current vocational education and training enterprise; highlights several social, technological, and economic factors influencing the education and training enterprise; and examines selected trends and issues facing vocational educators.

The Vocational Education and Training Enterprise

The vocational education and job training enterprise requires the collaborative efforts of a variety of agencies and programs. Key among the providers of education and training are publicly funded secondary and postsecondary vocational education institutions; federally funded training programs such as those provided through the Job Training Partnership Act including the Job Corps; military job training; on-the-job training offered by business, industry, and trade unions; proprietary vocational schools; and apprenticeship training programs.

Despite overlaps and gaps, each education and training agency or program has unique purposes and clientele. Collectively, they constitute a very significant enterprise, affecting millions of lives and spending billions of dollars annually. They differ from each other fundamentally in their goals--from remediating early socialization gaps to increasing profit margins. Their strategies range from traditional classroom practices to on-the-job mentoring. They focus upon competencies that range from literacy skills to technical proficiency in lightly skilled jobs, from personal development to work socialization. Their organizational structures range from federal, state, and local public and private agencies to small entrepreneurial operations.

This enormous diversity in programs and services provides multiple service deliverers at the local level so that individuals of different ages and stages in their lives have options that meet their specific developmental and employment needs. For example, adults who have been displaced by technological improvements need job training just as much as high school seniors who do not plan to attend postsecondary schools (Hollenbeck, Pratzner, and Rosen 1984). However, much of the potential value of this diversity may be lost because of the independence of the programs and the apparent lack of models, incentives, or mandates for effective collaboration, cooperation, or linkage. Because these diverse programs have not been viewed by themselves or with others as components of an "articulated system" for work prep-

aration, there has been little coordination or collaboration in their policies, practices, or services. Moreover, they do not share a common approach to education and training or a common philosophy of human resource development.

One of the most important and least understood roles of vocational education is its role in the nation's decentralized education and job training system. This is a decade of tight budgets at all levels, shortages of youth in the labor market, displacement of adult workers, underemployment, and increased needs for retraining. Therefore, policymakers and practitioners need to understand more clearly the decentralized education, training, and employment delivery system in which vocational education operates. The following briefly describes the major education and training institutions and programs.

Public Sector Programs

Publicly supported vocational education and training programs are offered through secondary and postsecondary institutions, military job training, and Job Training Partnership Act funded training programs.

Secondary vocational education. Public secondary vocational education is offered in approximately 17,000 high schools in the nation (National Council on Employment Policy 1982). Evans (1982) notes that four principal goals of vocational education are to "(a) provide the skilled workers needed by society, (b) increase the work-related options of trainees, (c) increase the face validity of general education and (d) enable trainees to improve their working conditions" (p. 267). He stresses that no other occupational training system seeks to achieve goal (c), enhancing general education.

Enrollments in vocational education have grown substantially in the last decade. In 1970 there were 6 million students enrolled in secondary programs; at the beginning of the current decade there were 10 million (National Center for Education Statistics 1984).

Postsecondary vocational-technical education. Public postsecondary vocational-technical education is offered in more than 2,000 community colleges and technical institutes (National Council on Employment Policy 1982). With the growth and accessibility of 2-year postsecondary institutions, high school has become less of a "terminal" education program than it once was for many students. Although it is true that about one-fourth of the high school students drop out before completion and about one-third of the graduates enter immediate employment, a majority of graduates go directly into postsecondary programs; others return at a later time to 2-year institutions or combine postsecondary education with employment (Campbell and Basinger 1985).

Postsecondary enrollment has increased sharply in the last few years, as displaced and underemployed youth and adults have sought skills that are more salable in a rapidly changing labor market. In 1970 there were fewer than 1 million students in postsecondary programs; by 1984 there were over 10 million (National Center for Education Statistics 1984). Evans (1982) points out that over "one hundred and fifty occupations are taught" under six major categories (agriculture, business and office, marketing and distributive, health, home economics, and trade and industrial), and higher levels of education in each of these categories are provided for in the technical education category.

Adult vocational programs. Adult vocational programs constitute an important part of vocational education at both the secondary and postsecondary levels. Between 1978 and 1981, the number of adults in the population increased 2 percent, but participation in part-time instruction for adults increased 8 percent (Plisko 1983). Over 23 million people participated in more than 43 million adult education courses during the year ending May 1984 (Center for Statistics 1986). Job-related factors are most often cited as the reason for taking adult education courses. In light of current economic and social trends, the occupational emphasis in adult education is not surprising. Some adult workers are being displaced by technology. Many adults, such as displaced homemakers, are going back to work and finding the need to update their skills. Working adults are becoming more career conscious; many are eager to move into other, more satisfying jobs. Additionally, the growing national concern about the high rate of adult illiteracy highlights the need for adult education programs.

Adult vocational programs often are evening school courses that are part of the secondary school program or an offering of the local community college. These programs are usually staffed by part-time teachers and are often noncredit. These adult vocational courses provide individuals with a way of improving themselves at their own speed without the constraints and pressures usually associated with degree-granting programs.

The Job Training Partnership Act (JTPA). This act became law in 1982. As the nation's major federally sponsored job training program, JTPA provides a variety of training programs primarily for economically disadvantaged youth and adults and displaced workers. It focuses on training for occupations for which there is a demand and in industries where there is a high potential for sustained demand and growth. In addition, the act requires efforts to develop programs to help participants enter new careers and programs to overcome sex stereotyping. It eliminates public service employment, and it adds a new program focused on retraining displaced workers.

The Job Training Partnership Act involves close collaboration between the public and private sectors. Appointed by and advising the governor is the state job training coordinating council made up of representatives of business and industry, the state legislature and state agencies, local government officials, and public representatives including labor, schools, and community-based organizations. At the local or service delivery area (SDA) level are Private Industry Councils (PICs) representing business; education; organized labor; economic development, public employment service, and rehabilitation agencies; and community-based organizations. The PICs work under an agreement with local elected officials to determine the procedures for developing 2-year local training plans and for administering, monitoring, and evaluating training programs. Exemplary youth programs are authorized, including the following:

- Education for employment, primarily to help high school dropouts develop basic skills
- Preemployment skills training for 14- to 21-year-olds, such as remedial education and counseling
- Entry-level employment experience, such as tryout employment and cooperative education
- School-to-work transition assistance, such as occupational infor-

mation and job placement and follow-up (Capitol Publications 1982, p. 8)

According to the 1985 National Alliance of Business (NAB) survey of PICs and SDA administrators, over two-thirds of JTPA adult participants obtained employment at the completion of the 1984 program year, and 62 percent of youth completed school, enlisted in the armed forces, enrolled in another program, or achieved employment competencies (p. 67). According to the NAB survey, the public-private partnership concept--the belief "that the public and private sectors can successfully work together to help train and find jobs for the long-term unemployed and economically disadvantaged--appears to be working well in most service delivery areas" (p. 68).

Moreover, 86 percent of PIC chairpersons believe that private sector participation increases employers' receptivity to JTPA and its trainees, 93 percent feel that business participation improves programs, and more than 75 percent believe that private sector input makes a positive difference in participant outcomes (p. 69).

Job Corps programs. Under JTPA, the federal government continues to operate the Job Corps. These programs provide highly structured alternative education and training for hardcore unemployed and dropout youth needing residential and multifaceted programs. The strengths of these programs include the residential and controlled environment, the targeted population the programs serve, and the ability to motivate learners to successful program completion.

Military job training. Military job training is a large training establishment. "It is expected to have costs in excess of $10 billion in Fiscal Year 1982 and to provide over 236,000 student person-years of training" (Cooper and Huerta 1982, p. 39). Cooper and Huerta point out that "military personnel constitute about 2 percent of all United States' employment" (p. 44) with about 400,000 new recruits being attracted into the services each year.

Nearly 90 percent of enlisted personnel are in occupations that have civilian counterparts such as electronics repair, vehicle maintenance, and clerical occupations (Cooper and Huerta 1982). This means that there is a high potential for transferability of skills learned in the military to the civilian labor market. Additionally, "training in a military occupation may affect the individual's choice of occupational area in the civilian sector" thereby serving as an "important guide to subsequent career planning and occupational choice" (Cooper and Huerta 1982, p. 84).

Private Sector Programs

In the private sector, vocational education and training are offered by business and industry and proprietary vocational schools.

Business and industry training. Training provided by business and industry is vast and directed principally at adult workers. As noted by Carnevale and Goldstein (1983), "employee training by employers is by far the largest system for adult education" (p. 36).

A great deal of education and training for work is provided by employers in house or is sponsored by management and labor and obtained outside the corporation. Among the special strengths of in-house training provided by business and industry are clear incentives for learning, knowledgeable trainers addressing real technological and workplace needs, and practicality and

relevance.

Boyer (1985) estimates that corporations are spending $40-60 billion to train and educate nearly 8 million employees annually. "This approaches the total annual expenditure of all of America's 4-year and graduate colleges and universities . . . and may equal the total enrollment in these same institutions" (p. ix). Moreover, as noted by Carnevale and Goldstein (1983) and by Zemsky and Meyerson (1985), measurement problems and the lack of detailed company records systematically drive estimates of employee training below actual levels.

Having reviewed a number of significant surveys of training in the private sector, Goldstein (1980) concludes that the amount of formal and informal training in industry is huge, but it varies considerably by industry. Larger firms (500 or more employees) provide more formal training opportunities than small firms; formal training is mostly in the form of sponsored courses during working hours. Formal training is predominantly for managers and other white-collar workers, whereas manual workers get a disproportionately small share of formal training.

In general, large multinational corporations meet the lion's share of their education and training needs through their own programs--programs that they can directly control to meet their immediate needs and goals. Small (less than or equal to 50 employees) and medium-sized (50 to 500 employees) corporations and firms account for the bulk of the work force and create more new job openings annually than the large firms. However, they cannot provide adequately for their own education and training needs because of their size.

Apprenticeship and other training programs supported by organized labor and employers are also substantial. Such training is provided on national, regional, state, and local levels and is offered jointly by management and the unions. As of 1985, 18 percent of nonagricultural wage and salary earners claimed union membership ("Bureau of Labor Statistics Reports on Displaced Workers" 1984). Most collective bargaining agreements call for the establishment and funding of local Joint Apprenticeship and Training Committees (JATCs). JATCs also exist on the state and national level.

Apprenticeship is generally a jointly sponsored program consisting of on-the-job training and related classroom instruction. Glover (1982) estimated that there were approximately 300,000 apprentices in 1982, and the Bureau of Apprenticeship and Training forecasted 500,000 by 1985. The vast majority of these apprentices (61 percent) are in less than a dozen trades in the construction sector.

As it now operates, apprenticeship training in the United States is a relatively small but significant part of the overall vocational training system. Special consideration needs to be given to developing ways of expanding apprenticeship in the more rapidly growing sectors of the economy, such as in the electronics or health fields, if it is to remain a reliable and important component of the vocational education and job training system.

Proprietary schools. Proprietary vocational school enrollments have been expanding every year. In 1978, proprietary schools enrolled over 3 million students per year in over 7,000 schools (National Center for Education Statistics 1984). Gross annual revenues of at least $2.5 billion were reported for these schools in 1973 (Cann 1982).

Most proprietary schools are relatively small in size, number of courses of study, and enrollment--typically between 250 and 300 students. Cann (1982) notes that most schools have been incorporated and many are operated as successful subsidiaries and chains of schools by such companies as ITT, Bell and Howell, Control Data Corporation, and Airco.

Many proprietary school courses, such as bartending, diving, barbering, tool and die design, and medical office management, are not usually found in local public institutions. Generally, course offerings are fewer and the content is directly related to the job market (Meyerson and Zemsky 1985). The courses are also generally shorter, "often taking less than half the time required for similar course titles offered in public institutions" because of "less unrelated subject matter" (Cann 1982, p. 434).

SOCIAL, ECONOMIC, AND TECHNOLOGICAL TRENDS AFFECTING VOCATIONAL EDUCATION

Vocational education programs operate within a broad context out of which arise the critical issues they must confront. The context of secondary and postsecondary vocational education will be greatly influenced by social, economic, and technological forces in the next decade. Pucel et al. (1988) developed several assumptions about this context:

> In general, the assumptions indicated that there will be slow steady economic growth, increased personal consumption of goods and services, and a decline in the proportion of jobs in the goods-producing sector of our economy. We can expect an expansion of the service sector of the economy, with a pluralistic, multicultural social mix in the United States.
>
> There will be an increase in mass communications and advanced information technologies. The importance of the individual will be expressed in a trend toward participative styles in organizations, and values of self-fulfillment and self-actualization at all levels of society. With the increasing automation of repetitive tasks, workers at all levels will need to be increasingly competent in cognitive and affective, as well as psychomotor skills. Educational institutions will incorporate technology to increase effectiveness and efficiency, and employers and private groups will increasingly deliver educational services. (pp. 3-6)

These trends are examined in greater depth in the following discussion.

Social Trends

Changing demographics will be a major force shaping the way we live, thereby affecting all aspects of education including vocational education. The challenge for vocational education today and tomorrow is to provide programs that ensure equity, access, and quality for an increasingly diverse clientele. How can vocational education best respond to the needs of special learners such as handicapped, limited-English-proficient (LEP), and economically disadvantaged students? How can equal access to vocational education be increased? What strategies are most effective for dealing with the needs and pressures of a culturally diverse student population?

Increase in Minority Populations

Minority populations are rapidly increasing. Over one-third of new births are to minority parents. Thornton (1984) points out that 28.6 million blacks account for 12.1 percent of the population. Hispanic Americans, now numbering around 16 million, are expected to become the largest minority group in the next decade. The number of Asian Americans, the fastest-growing group, jumped 128 percent in one decade to total 3.5 million in 1980.

Few educators are prepared to deal with the problems spawned by these demographic trends. In many of our urban areas, "minority majorities" will increasingly occupy the classrooms. Along with the task of determining how best to serve the needs of an increasingly culturally diverse student body, schools are facing the difficult task of dealing with a worsening dropout rate though prevention and reconnection measures. At the same time that standards of academic excellence and achievement are increasing, so are the numbers of black, Hispanic, and other minority youth who traditionally have not done well in academic learning. How these academically less able and dropout-prone students are best served and what role vocational education should play in the education of these groups is of great concern.

Across the nation, more than one in every four students enrolling in the ninth grade drop out before high school graduation. Compared to white students, the dropout rate for black students is just under twice as great and for Hispanic students it is twice as great (U.S. General Accounting Office 1986, p. 6). In some school systems, the dropout rate for Hispanic students approaches 70 percent. Dropouts experience higher unemployment rates and lower earnings throughout their lives, creating a potential future dual-class society. In effect, many of these individuals not only drop out of school, but drop out of life (American Vocational Association 1986).

Women, minorities, and the handicapped continue to suffer higher unemployment rates than white males. The problem is exacerbated for teenagers, especially minority teenagers. For many historical reasons, women and minorities are crowded into specific kinds of occupations. Because of this situation, on the average, minority men earn less than majority men, and women earn about 63 percent of what men earn.

In 1982, when the median income for white families was $24,603, the median for Hispanic families was $16,228, and for black families $13,599 (Trafford 1984). More children are living in poverty than at any time since the "Great Society" reforms began in the 1960s. Thus, the challenge is how to incorporate the poor into our culture in ways that enable them to share in the wealth and influence available in this country.

Increase in Nontraditional Families

Rossman (1985) notes that only 7 percent of Americans now live in families with a working husband, homemaker wife, and two children. It is estimated that about one-third of all children will spend some of their growing-up years in a single-parent household. In 1984, 1 in every 7 families was headed by a woman, up from 1 in 10 families in 1960 (Trafford 1984).

Moreover, the teenage out-of-wedlock birthrate has increased dramatically. In 1950 fewer than 15 percent of teen births were out-of-wedlock. By 1983 more than half of teenage births were out-of-wedlock and in some regions of the country, the figure exceeded 75 percent (Wallis 1985). Approximately 560,000 children are born to teenagers nationwide each year (DiPerna 1984). DiPerna states the following:

> According to the Alan Guttmacher Institute, 80 percent of teenage young women who drop out of school do so because they are pregnant; 90 percent of teenage mothers eventually join the ranks of the unemployed; and 66 percent eventually receive welfare payment. (pp. 57-58)

Vocational education programs, career

counseling, job search skills, placement assistance, and the development of basic skills, employability skills, work habits, and attitudes are all critical needs of these youth. Access to appropriate support services (for example, child care programs and services, transportation) are critical prerequisites.

Aging of the Population

The U.S. population is aging and workplace changes are increasing the need for adult recurrent education. As as result, the nature and the delivery of adult learning in educational institutions that serve adults and in the workplace will be of growing concern to business and industry and to vocational education. With individuals living longer, the United States is rapidly becoming a nation with many older citizens who will place increasing demands on the educational system. For the first time in U.S. history, there are more people 65 and over than teenagers in the population, and by 1990 the number of older citizens is expected to surpass 31 million, whereas the teenage population will shrink to 23 million (Sanoff 1984).

Lower birthrates, increased life expectancy, and the aging of the "baby boom" generation are causing the population to grow older. By 1990, the number of people between the ages of 30 and 44 will increase by 20 percent and total 60 million. This aging process is resulting in an increased need for adult education.

Workers with critical technical skills will be retiring at an increasingly rapid rate. For example, the average age of the nation's 300,000 machinists is 58, yet industry is training only one-fourth of the skilled machinists needed each year (American Vocational Association 1986). Effective adult, career, and vocational education responses to these shortages need to be developed.

Changes in Life-Style

How Americans live and with whom they live will continue to change and to have profound effects on vocational education. These changes will include--

- o smaller families, with more households headed by women and one in two marriages ending in divorce;
- o increasing numbers of both men and women who never marry;
- o more people eating out more often, purchasing more luxury items, and taking more exotic vacations;
- o sharp increases in sexually transmissible diseases that may result in the emergence of a New Victorianism with the possibility of decreasing the rapidly increasing rate of divorce; and
- o dramatic increases in the snack food industry.

Increasingly, individuals will have more responsibility for their own health. It is anticipated that health-promoting activities, such as exercise classes, home gyms, and employee fitness programs, will cease to be regarded as luxuries and will grow rapidly in number and scale. Two health-related trends likely to affect the types of vocational education programs needed to prepare workers in the future are a dramatic increase in the number of elderly persons needing special health care and increasing emphasis on the environmental and occupational health and safety issues.

Changes in the Culture of the Workplace

Rose (1986) sees such problems for blue-collar workers as foreign and interregional competition, automation, and the declining strength of labor unions. For professionals and middle managers, he sees problems with the large number of highly educated baby boomers, the postponement of retirement, automation, and the tendency to streamline the corporate structure as likely to keep many people from progressing in their careers, thus creating stagnation and underemployment.

Defining the contributions of vocational education to business and industry will be an increasing concern. What is the optimal relationship between vocational education and business and industry? What collaborative models are most effective for achieving articulation and responding to lifelong recurrent education needs of adults? How can vocational education help develop skills required for managing change and lifelong learning?

The worker of the future will be more oriented to--

- o autonomy--more individuals or work groups will work with less supervision;
- o getting the job done--individuals will want to maximize their use of leisure time;
- o personal computers at home and at work;
- o flexitime and flexiplace--individual productivity will be enhanced by adapting work time and workplace to respond more adequately to individual preferences; and
- o having more choices of consumer goods.

The way Americans work and the types of work they do will continue to change. Job sharing, part-time employment, and flexible work schedules will become increasingly commonplace. More individuals will work with robots, computers, and other forms of automation. New types of jobs, such as space station workers or underseas miners, will emerge. Workers' attitudes toward their jobs--demanding greater job satisfaction and better working environments--could bring about many changes in the workplace.

Technological and Economic Trends

Uncertainty and disagreement exist about the nature of technological development and change in the workplace, its impact on skill requirements and on the education and training needs of workers. However, three broad types of educational consequences seem to be especially important: (1) changes in skills and skill levels of workers resulting from technological changes, (2) changes in the workplace as a learning environment for continuing and recurrent education, and (3) changes in the educational infrastructure to support economic development (Johnston and Packer 1987).

Technological Changes

Many people conclude that technological change is resulting in an increased demand for higher levels of skill and better trained workers, whereas others argue that most jobs now and in the future will require less skill rather than more. The latter contend that the proliferation of high technology industries and their products is likely to reduce the skill requirements of jobs.

This uncertainty over the educational

consequences of technological change exacerbates a traditional split among educators and policymakers concerning the appropriate role and function of job training and vocational education as part of the nation's public education system. Many who hold the view that technology increases skill demands argue that schools should increase the availability of highly specialized technical job skill training. Others argue that the de-skilling effects of technology require greater attention to the development of broadly applicable basic and higher-order skills.

Of growing importance in today's global economy is the transformation of the workplace into a learning environment. Increasingly, employers need to provide efficient and effective conditions for recurrent learning in the workplace in order to keep individuals and the corporation up to date with technological, social, and economic changes. This creates a need for a better understanding of the implications of technological change for the recurrent learning needs of adults and corporations and of the conditions necessary to facilitate rapid and flexible adult learning in tomorrow's workplace (Perelman 1984). Current joint labor-management agreements contain important models of training.

It is generally thought that a strong educational system, particularly post-secondary and adult education, contributes to the economic health of a region or state. The link between perceived quality of education in an economic area and its ability to attract resources and spur employment is an important area of concern. Educational quality, particularly in vocational education, leads to higher labor productivity (Bishop 1982), which can give local business a competitive edge. A major and growing contribution of education to economic development is customized training. In these collaborative arrangements, industries are relying on the comparative expertise of educators to provide specific training as well as basic skill remediation to their employees.

International Competition

The past decade has seen great changes in international trade. An increasing number of industrial jobs are being lost as other nations have developed their industrial capacity and U.S.-based firms have moved production to other countries to take advantage of lower wage structures (Zahniser, Ashley, and Inks 1985).

The United States participates in an increasingly complex and competitive global economy. "By 1980, more than 70 percent of all goods produced in the United States were actively competing with foreign-made goods" (Reich 1983, p. 121). But as Reich points out, "American producers have not fared well in this new contest" (p. 121). Reich's figures indicate that--

> since 1963, America's share of the world market has declined in a number of important areas: automobiles, by almost one third; industrial machinery, by 33 percent; agricultural machinery, by 40 percent; telecommunications machinery, by 50 percent; metalwork machinery, by 55 percent. (p. 122)

Reich argues that, whatever the final product, "those parts of its production requiring high-volume machinery and unsophisticated workers can be accomplished more cheaply in developing nations" (p. 121). Skilled labor, according to Reich, is the only dimension of production where the United States can retain an advantage over developing nations. "Flexible-system production" is seen by Reich as the

reverse of high volume, standardized production and as the way for the United States to gain competitive advantage in the global economy.

> Flexible-system production is characterized by technological innovation, precision manufacturing, and customization of products. It demands a new style of management, emphasizing teamwork instead of hierarchy and problem-solving instead of routinization. . . . Flexible-system production is rooted in discovering and solving new problems; high-volume, standardized production basically involves routinizing the solution to old problems. (p. 247)

As noted by a New York Stock Exchange study in 1982, although current investments in human capital developments are relatively small, its potential benefits are enormous. Reich (1983) supports this:

> Financial-capital formation is becoming a less important determinant of a nation's well-being than human-capital formation. . . . Only people can recognize and solve novel problems. Machines can merely repeat solutions already programmed with them. (p. 236)

He concludes that "industries of the future will depend not on physical 'hardware' which can retain a technological edge," but on human resource development.

Economic Factors

There is a growing fear, however, that the development of human resources is not keeping pace with rapid developments in other areas. A serious and growing imbalance between available jobs and trained technical workers may stifle the rapid application of high technology and choke national efforts aimed at economic development and revitalization.

Statistics from the U.S. Department of Labor ("Bureau of Labor Statistics Reports on Displaced Workers" 1984) indicate that approximately 5.1 million workers were displaced from their jobs between January 1979 and January 1984, partly because of international competition. Although 3.1 million were reemployed when surveyed in January 1984, 900,000 of these individuals reported earnings that were lower than those of their previous jobs. Another 360,000 of the 3.1 million who had been in full-time employment were in part-time jobs when surveyed. Two million were still among the ranks of the unemployed.

Small businesses will continue to account for the majority of new jobs. Many of these jobs will result from the entrepreneurial spirit currently affecting the economy. These small businesses find it difficult to train their employees, thus creating a demand for external assistance.

Many older, declining industries will change dramatically with the increased use of automated equipment and the introduction of completely new technologies and occupations. If they do not, they will rapidly fade. Meanwhile, new production industries in high-technology fields, such as computers and microprocessors, lasers and fiber optics, robots and flexible manufacturing, and biotechnology and automated information processing, will contribute to major shifts in employment from traditional manufacturing and blue-collar jobs to the service sectors, white-collar occupations, and new manufacturing areas (Taylor, Rosen, and Pratzner 1982).

A summary of work and career trends indicates that--

- o 5 of the 16 fastest-growing jobs over the next few years will be computer-related, with programmers and systems analysts growing by 70 percent in the next 10 years;

- o 25-35 percent of all paid work in the United States will be done from people's homes by the turn of the century; and

- o services will account for 92 percent of the jobs and 85 percent of the gross national product (GNP) by the year 2000, compared with 70 percent of the U.S. jobs and 60 percent of the GNP today.

These rapid and dramatic changes in the workplace are making the skills of a growing number of adults obsolete, greatly expanding the need for new skills, and creating a demand for anticipating training needs prior to job displacement. The changes promise to increase work specialization (with its attendant need for highly specialized skill development) and at the same time increase the need for greater individual employment flexibility and adaptability. On the one hand, education and training for work must be directed toward providing programs for the development of technical skills and concepts and applied math and science knowledge and skills, required by specialized occupations. On the other hand, education and training must simultaneously provide preparation and skills required by changing labor market conditions and opportunities. They must direct attention to what they can do to prepare workers effectively not only for specific jobs, but also for adaptation to new jobs and occupational requirements.

VOCATIONAL EDUCATION TRENDS AND ISSUES

Vocational education is one of the primary methods by which society prepares for the future. In general, schools and school personnel have been slower to respond to change than many other segments of society. However, as societal goals change, the goals and strategies of vocational education also need to change.

The following subsections examine some of the the general trends that have emerged in the field in the 1980s, as well as the problems and issues that will challenge the field throughout the remainder of this decade and into the 1990s.

General Trends

Three major trends in vocational education have emerged in the 1980s: (1) an impetus for reform, (2) changing administrative and instructional roles, and (3) an emphasis on access to high quality programs.

The publication of *A Nation at Risk* (National Commission on Excellence in Education 1983) started a ground swell of reform aimed at raising the academic standards of U.S. schools. Even though vocational education was not mentioned in the report, this movement has now encompassed vocational education as well. Secondary vocational education particularly is being asked to formulate a new vision in order to improve its social, economic, and educational value. In addition, it is being asked to give serious attention to designing new approaches to prepare today's students for tomorrow's jobs and to improve its articulation with postsecondary vocational-technical education. The following changes are among those suggested in *The Unfinished Agenda* (National Commission on Secondary Vocational Education 1984):

- Programs must accommodate a greater diversity of learners, including women, Hispanics, blacks, the handicapped, limited-English-proficient individuals, and older adults.
- Programs must not only develop occupational skills, they must also improve students' basic skills.
- Programs must develop more purposeful collaboration between vocational education and the private sector in order to increase articulation and communication between the two sectors.
- Programs must improve their accountability not only in effectively preparing individuals for participation in the work force, but also in addressing a wider range of personal, social, and vocational development.

The second general trend is changing administrative and instructional roles. U.S. education is experiencing a radical decentralization in the management of education as authority and responsibility increase at the local level. Administrators and teachers are working more closely with parents and other interested stakeholders. Teaching and teacher education are becoming more

complex and diverse. All of these roles are changing in response to the following emerging developments:

- o New technologies with the potential to transform the classroom, laboratory, and shop
- o Alternative forms for delivery of teaching/learning experiences (for example, apprenticeships and internships)
- o Changes in patterns of training (for example, open-entry/open-exit, varying lengths of training, greater variation in learner age levels and experiences)
- o The need to adapt programs for a variety of learners, especially those needing basic skills
- o Higher standards for preparation and certification of vocational teachers, which have implications for the status of nondegreed vocational teachers, the need to upgrade teacher preservice and inservice preparation, and the need to attract and retain minority teachers

The third general trend is access to vocational education. The National Commission on Secondary Vocational Education (1984) identified four reasons why access to secondary vocational education is declining for many students: increased emphasis on academics, program consolidation, time scheduling, and inadequate or inaccurate student knowledge of vocational education. Reports by such policy bodies as the National Commission on Excellence in Education (1983) and the Education Commission of the States (1983) have catalyzed changes in high school graduation requirements in many states. Most of these changes aim primarily at preparing students for college attendance--making it more difficult for students to participate in secondary vocational education. Ironically, this move comes at a time when only one-fifth of the employment slots across the country require a bachelor's degree or higher. In addition, many students who need vocational education drop out before they can benefit from it. Whether they leave because of a lack of interest in school, poor achievement, or inadequate basic skills, dropouts face a bleak future.

Specific Issues

Within the framework of these broader trends, a number of significant specific issues emerge. Several of these are discussed next:

Meeting the Needs of At-Risk Populations

The Carl D. Perkins Vocational Education Act of 1984 (P.L. 98-524) emphasizes federal support of increased vocational education opportunities for special target populations, including persons with disabilities, limited English proficiency, and/or disadvantage, as well as the incarcerated, displaced homemakers, single parents, and adults in need of retraining. A number of writers have identified issues related to at-risk groups (Berry and Feldman 1983; Coffey and Carter 1986; Corthell and Van Boskirk 1984; Douglass 1986; National Alliance of Business 1986; Office of Technology Assessment 1986; Weber and Puleo 1988). Specific issues related to at-risk groups include the following:

- o **Access**
  - --How can the enrollment of at-risk groups in vocational education be increased?
  - --How can enrollments of at-risk students be more equitably dis-

tributed across all vocational education program areas?
--How can both internal and external barriers to participation in vocational education be reduced?

o **Program Quality**

--How can individualized planning be implemented to respond to specific needs of at-risk individuals?
--How can the quality of programs that are available to at-risk individuals be ensured?
--How can teacher competence in providing vocational education to at-risk learners be increased?

o **Support Services**

--How can financial support best be provided to encourage adults at risk to participate in employment and training programs?
--Does the use of the case management approach in educational settings provide a viable model for ensuring coordinated, high quality support services for at-risk groups?
--What are the most effective methods of combining basic skills remediation with occupationally relevant training?

o **Interagency Coordination**

--How can barriers (for example, differences in terminology, goals, outcomes, and services) to interagency coordination be reduced?
--What is the most effective mix of efforts that supports both legal compliance and program improvement?

o **Family Influence**

--What family characteristics increase the risks of target group members for school dropout, low educational attainment, and unemployment or underemployment?
--What family interventions are most effective in reducing these risk factors?

o **Employers**

--What are the most effective methods of increasing employers' willingness to hire members of special target populations?
--What are the most effective models of work-site training and on-the-job support services for various target groups?
--What are the most effective strategies for preventing worker displacement?

o **Disadvantaged Groups**

--Although effective models exist, why have programs not been more effective?
--How can the severe academic deficiencies of disadvantaged youth and adults be remedied so that they can become more successful in vocational education and adult retraining?
--What can be done to make employers more willing to hire disadvantaged youth and adults?

o **Limited English Proficiency**

--How can vocational education teachers become more competent in the recruitment and intake assessment of limited-English-proficient (LEP) learners?
--How can information on programs and materials for use with LEP persons in vocational education be more effectively disseminated?

o **Sex Equity**

--How can the enrollment of women in nontraditional programs be increased?
--How can skill upgrading best be

provided to women who are currently in the labor force?
--What support services are most needed to help women deal with multiple role demands?

o Adults

--How can access to vocational training programs be increased for high-risk adults?
--How can the basic skills of adult workers be improved?
--How can adult literacy be increased to support training efforts?
--How should the trend toward underemployment be addressed?

o Disabilities

--How can the placement of students with disabilities in vocational education programs be more congruent with their interests, abilities, and special needs?
--How can vocational education make more effective use of education accommodation for students with handicapping conditions?
--How can interagency coordination be maximized to support education and employment of individuals with disabilities?

o Incarcerated Persons

--How can the multiple problems of many incarcerated persons, including lack of social, emotional, and academic skills, best be reduced?
--How can the major institutional barriers to the provision of vocational education in correctional institutions be reduced?
--How can the delivery of high quality education be made a higher priority in correctional institutions?

Preparation of Vocational Teachers

Vocational teacher education is experiencing reorganization, unification, modernization, and redirection. At the same time, it faces declining financial support, lower enrollments, program image problems, outdated curricula, and a decreasing teaching force.

The Holmes Group (a consortium of major research universities) has developed an agenda for the reform of teacher education that has serious implications for vocational teacher education. The most relevant Holmes Group proposal aims to phase out the undergraduate education major in member colleges and universities and develop in its place a graduate professional program in teacher education (*Tomorrow's Teachers* 1986). Such a 5-year teacher preparation program may encourage many excellent, would-be vocational teachers from colleges, the military, or business and industry to reconsider their career options.

On the other hand, it has serious implications for vocational education so reliant on work experience as a key criterion for teachers. Among the issues of particular concern to vocational education are the impact of higher standards for preparation and certification on the supply of new vocational teachers, what to do about nondegreed vocational teachers--including those already teaching and those who seek entry into vocational teaching from business and industry, how to update and upgrade vocational teacher preservice and inservice preparation, and how to attract and retain minority vocational teachers.

In light of these broader issues, the following ways of modernizing vocational teacher preparation have been suggested:

- Programs and approaches to prepare all vocational teachers to meet the needs of special student populations

- Programs and strategies to recruit and retain significantly increased numbers of minority vocational teachers

- Programs and emphases on adult learning and development and on the education and training of adults in general and for work in particular

- Curricula and programs to prepare for new teaching roles, titles, and responsibilities resulting from greater staff differentiation and career ladder initiatives

- Recognition and emphasis of the teacher career development continuum and the need for lifelong learning

- Curricula and programs to prepare vocational teachers for greater autonomy, participation, and shared decision making in school management and operations

- Programs and approaches to prepare vocational teachers to enhance and reinforce basic skills and higher-order skills in vocational courses

- Preservice and inservice programs to develop knowledge and instructional skills in concepts generic to work today--the nature of change in the workplace, quality control, productivity improvement, entrepreneurship, and participative management (Adams et al. 1987)

Improving Basic Skills of Vocational Students

Because at least 40 percent of high school graduates do not go to college, the development of good basic skills is not the sole responsibility of the academic curriculum. All students--academic, vocational, or general preparation--must be helped to meet the higher standards that are emerging.

Basic skills play an important role in ensuring job success. Employers expect their employees to be able to use basic math and reading skills to solve work-related problems. Basic skills represent a critical area of learning that needs to be addressed in all areas of the curriculum. Because the increased emphasis on academic requirements has reduced the time available for vocational courses, a debate has arisen over the amount and type of courses needed. Many academic basic skills are embedded in vocational tasks, however, and vocational tasks allow realistic use of academic basic skills. Clearly, neither should be taught in isolation from the other. Vocational educators need to find more and better ways to integrate academic concepts with vocational skills training (Pritz and Crowe 1987). Weber and Puleo (1988) state:

> Although vocational classrooms offer frequent and varied opportunities for reinforcing and enhancing students' basic skills, far too many of these opportunities are lost and more needs to be done if the intent of the Perkins Act in this critical area is to be realized. (p. 7)

Reducing the Dropout Rate through Vocational Education

The annual dropout rate among teenagers is already a large national problem. Some educators now predict that the increased emphasis on academic requirements for high school graduation will result in even higher dropout rates.

Vocational education's impact on school retention can be improved by strengthening programs to meet the needs of potential dropouts. To do so, programs must help potential dropouts learn in meaningful ways. Appropriate, equitable ways must be found to help students see vocational education as a viable option; conduct outreach and recruitment programs for dropout-prone students; and help students identify, enter, and complete comprehensive occupational skill development programs. Early career awareness, career exploration, and work-study experiences also hold promise and require careful consideration (Weber 1986).

Secondary and Postsecondary Program Articulation

Articulation is the coordination of educational programs that allows students to progress without duplication of time, effort, or expense to themselves or to taxpayers. It includes the granting of postsecondary or college credit for the mastery of competencies that are equivalent to the postsecondary or college course. It also includes sharing of resources, faculty, facilities, and equipment (Lerner 1987).

Secondary-postsecondary arrangements have become more numerous and comprehensive. Future efforts will need to focus on guaranteeing relevant curricula to meet student and labor market needs, developing state policies to support articulation, and implementing local articulation plans. Although state policy can support or even mandate articulation, local factors such as turf conflicts, faculty resistance, poor communication, and incompatible curriculum are greater barriers than external problems such as state-level policy (Long et al. 1986).

Linking Public and Private Sector Training Delivery Systems

If U.S. businesses are to compete successfully in world markets, public providers of vocational education and employer-based training organizations must find ways to pool their knowledge. According to Ruth (1987), dwindling resources and ineffective or duplicative delivery systems for education, training, and support services make the development of better linkages between the diverse public and private delivery systems a necessity.

In order to facilitate such linkages, the following specific questions need to be addressed:

- What types of education and training can be provided most effectively by which providers?
- What basic skills are needed for success in the workplace and where are they best taught?
- How can high quality curriculum standards be ensured?
- How can the continuing transfer of training technology between educational institutions and employer-based training organizations be ensured?

Smith and Trist (1988) recommend the following six policy initiatives to stimulate public-private collaboration:

1. Strengthen and enlarge the nation's investment in public education.
2. Reorient federal vocational education programs to permit greater flexibility, more service to disadvantaged persons, and more private sector participation.
3. Modify JTPA performance incentives to encourage longer-term invest-

ments in innovative programs.

4. Provide stronger federal support for public-private training initiatives.

5. Support development and use of techniques that teach higher-order thinking skills.

6. Build public awareness of the nature of economic and workplace changes and promising cooperative solutions.

Effects of Technology on Education and Training

The effects of emerging technologies on vocational education raise issues in three areas: (1) the adoption and use of technology to deliver instruction, (2) technology as subject matter, and (3) the importance of keeping up to date with technological advances as they relate to the workplace.

Educators need to become familiar with emerging instructional technologies--including their advantages and disadvantages--in order to make informed decisions about whether certain technologies can facilitate the achievement of instructional goals. Instructors must consider how their roles will change as a result of using educational technologies. Since technology can perform many basic education functions, educators may need to perform as program developers and managers rather than as direct instructional deliverers (Miller 1982).

Existing pretechnology and technology curriculum models should be tested to determine their quality and to identify the most effective ways of incorporating these areas into existing curricula. Curriculum developers must find effective ways to monitor technological developments and revise curricula to include emerging concepts. This will require stronger linkages to research and industrial settings in which technological development occurs (Miller and Imel 1987).

Uncertainty and disagreement exist about the nature of technological developments in the workplace and their impact on skill requirements and on the education and training needs of workers (Meyer 1985). As a result, the appropriate role of job training and vocational education is in question. Vocational educators must continue to follow technological changes closely in order to assess their effect in the workplace.

The Use of New Cognitive Research in Vocational Education

Recent advances in cognitive psychology provide insights into thinking processes and learning behavior that can help prepare students for the demands of the workplace. A new view of learners, learning, and intelligence is emerging. Intelligence is now seen as a set of thinking and learning skills that can be modified.

Laster (1985) suggests that vocational educators can incorporate cognitive psychology concepts in vocational curriculum and instruction in the following ways:

- Use curriculum materials that require students to process information in order to form concepts, procedure rules, and patterns of conditions needing action

- Develop learning and problem-solving strategies as curriculum components for use in high school and adult programs

- Implement an information processing approach to learning

- o Develop condition patterns and procedural rules for vocational education
- o Develop model career development systems for high school and adult vocational education

Cognitive psychology has potential for helping vocational students develop problem-solving and learning skills needed for successful careers in the workplace. Vocational educators will need to cope with new technology, new concepts, and new procedures.

Granting Academic Credit for Vocational Education

Recent studies criticizing public education call for schools to strengthen their curricula in the basic skills. In response, educational policymakers in many parts of the country are increasing the number of academic credits needed for high school graduation. As a result, the amount of time left in the high school student's program for vocational courses has diminished.

Copa and Johnson (1988) examined the relationship between vocational education and high school graduation requirements in four states where vocational education is used to assist students in meeting graduation requirements in more general subject matter areas (that is, communication, mathematics, science). They found that the process must address (1) incentives for developing and nurturing the relationship, (2) ways of describing the relationship, (3) processes for putting the relationship in place and continuing maintenance, and (4) means of dealing with barriers and facilitators to the relationship.

As of 1985, 11 states established policies allowing vocational credit to be counted in lieu of science or mathematics, and 16 states gave local school districts jurisdiction over course credit approval. Only three states had a policy prohibiting credit allowance for vocational subjects as a substitute for math, science, or any other required subject (Delaware Department of Public Instruction 1985). Although vocational education courses deliver 14 areas of instruction in addition to technical skills, math, science, and communication skills are usually the areas considered for awarding academic credit. The issue of whether to grant academic credit for vocational courses as a means of strengthening basic skills preparation will become increasingly important as vocational educators continue to explore ways of offering vocational education and satisfying the academic requirements.

Extending Aspects of Vocational Education to Elementary Education

A great deal of interest has recently arisen, particularly at the federal level, in bringing basic vocational education courses and career guidance information to the elementary school level ("House Panel Hears ED's Voc Ed Advice" 1987). The "Ag in the Classroom" program is one example of extending vocational education-related information into the elementary grades. In 1981, a U.S. Department of Agriculture task force set up a national "Ag in the Classroom" program. Long-range plans in Ohio are to reach students in kindergarten through eighth grade. Currently, a rural rehabilitation grant project is aimed at grades four and five. A notebook of short lesson plans is being developed with student worksheets to blend in with science, social studies, language arts, and math lessons. The materials are designed to enhance or supplement what is being taught in the classroom, but not to be an additional load for the teacher (Minot 1988).

This concept seems to be reverting back to the "Career Awareness" stage of the school-based career education model of the early 1970s. In this system, first- and second-grade students examine occupations in the immediate environment and gradually broaden that environment to encompass the community. Students in grades three through six compare and contrast occupations in the immediate area to those found in other communities.

The importance and focus of issues change with educational level (local, state, federal) and with responsibility (policymaker, administrator, instructor). The list of issues could be ongoing; for example, providing vocational education to sparsely populated rural areas, providing vocational education to immigrants, assessing the effectiveness of vocational education programs, and examining the societal impact of increased graduation requirements on at-risk youth.

SUMMARY

The vocational education and job training enterprise requires the collaborative efforts of a variety of public and private sector agencies and programs. The chief providers of education and training are publicly funded secondary and postsecondary vocational education institutions; federally funded training programs such as those provided through the Job Training Partnership Act; military job training; on-the-job training offered by business, industry, and trade unions; proprietary vocational schools; and apprenticeship training programs.

Vocational education programs will be greatly influenced by social, economic, and technological forces. The social changes or forces include an increase in minority populations, an increase in nontraditional families, the aging of the population, changes in life-style, and changes in the culture of the workplace. The technological and economic forces on vocational education will appear in the form of (1) changes in skills and skill levels of workers resulting from technological changes, (2) changes in the workplace as a learning environment for continuing and recurrent education, and (3) changes in the educational infrastructure to support economic development.

During the 1980s, three major trends have emerged in vocational education: (1) an impetus for reform, (2) changing administrative and instructional roles, and (3) an emphasis on access to high quality programs. Within the framework of these trends and influenced by the social, economic, and technological forces numerous issues and problems emerge. The following are selected issues:

- o Meeting the needs of at-risk populations
- o Preparation of vocational teachers
- o Improving basic skills of students enrolled in vocational education
- o Reducing the dropout rate through vocational education
- o Secondary and postsecondary program articulation
- o Linking public and private sector training delivery systems
- o Effects of technology on education and training
- o The use of new cognitive research in vocational education
- o Granting academic credit for vocational education
- o Extending aspects of vocational education to elementary education

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