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ABSTRACT

For those individuals wishing to know more about the topic, this publication provides an introduction to industry-specific training. The need for industry-specific training programs (ISTPs) is addressed. An overview follows of how to develop the capacity needed in state and local organizations to design and implement industry-specific programs. A section on marketing outlines some factors that training providers should consider in developing a marketing plan. The next section relates the elements of program design to ISTPs. It enumerates the characteristics of good programs and focuses on tailoring program design elements to ISTPs. Barriers to program development are also identified. A discussion of trends in industry-specific training concludes the paper. An annotated list of resources describes sources of further information about ISTPs. (YLB)

Information Series No. 314

Industry-Specific Training Programs An Overview

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The ERIC Clearinghouse on Adult, Career, and Vocational Education
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Foreword

The Educational Resources Information Center Clearinghouse on Adult, Career, and Vocational Education (ERIC/ACVE) is one of 16 clearinghouses in a nationwide information system that is funded by the Office of Educational Research and Improvement, U.S. Department of Education. One of the functions of the clearinghouse is to interpret the literature in the ERIC database. This paper should be of particular interest to training providers in vocational-technical institutions, community colleges, and universities and to others who are interested in developing customized training programs.

Walter R. Howard, Director of Economic Development, Georgia State Board of Postsecondary Vocational Education, developed this paper for ERIC/ACVE. Dr. Howard is the director of Georgia's successful Quick Start Training Program. He has also served as regional director of vocational program management for the Georgia Department of Education and has been a vocational instructor and supervisor at the high school and college level and in the military.

The National Center wishes to acknowledge the leadership provided to this effort by Dr. Robert E. Taylor, recently retired Executive Director. Recognition is also due to Joe Sturdivant, Director, Business and Industry Services, North Carolina Department of Community Colleges; to Edgar E. Hornback, Executive Director, Business and Industry Training, Indiana Vocational-Technical College; and to Frank Pratzner, Senior Research Specialist, and William L. Ashley, Research Specialist 2, the National Center for Research in Vocational Education, for their critical review of the manuscript prior to publication. Wesley Budke and Susan Imel coordinated the publication's development, assisted by Sandra Kerka, Cheryl Harrison, and Cathy Thompson. Clarine Cotton, Jean Messick, and Sally Robinson typed the manuscript; Janet Ray served as word processor operator. Editorial services were provided by Ciritta Park.

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Executive Summary

Industry-specific training (IST), sometimes called customized training, involves the design of training programs especially for a particular industry or company. The impact of IST on the economic development of a state or region and on the competitiveness of an industry implies the necessity for close collaboration among employers, state agencies, and training providers such as colleges and vocational schools.

This paper gives an overview of industry-specific training programs. First, the need for such programs is addressed. Rapid technological changes, increased foreign competition, and geographic relocation of industries require quick, intensive, specific training to develop the workers that industry needs.

Next, the development of capacity in state and local organizations is discussed. Some states have enacted special legislation that enables them to provide such services as consultation, liaison with vocational education institutions, and assistance with employee recruiting and screening. The state's commitment to IST is manifested in the attitudes of government and local community leaders and in the provision of adequate funding to support its development. To assist in this effort, the National Association of Industry-Specific Training Programs was established in 1984 to facilitate working relationships among the providers of customized training on a national basis.

Effective marketing of industry-specific training programs (ISTPs) is essential to meeting the increased competition faced by states for attracting resources and by educational institutions for attracting students. A section on marketing outlines some factors that training providers should consider in developing a marketing plan. The training provider needs to acquire specific knowledge about the client company's operations, products, customers, and competition; about the provider institution's capacity; and about environmental factors such as the legal, social, economic, technological, and demographic conditions of the state and locality.

Potential conflicts between the viewpoints of education and industry must also be considered. Customized training programs must respond to exact industry needs. Differences in academic and industrial priorities should be addressed and mutually satisfactory compromises reached. Institutional flexibility should be stressed in marketing the program.

The success of an ISTP requires above all strong institutional commitment from all levels of administration as well as instructional staff, including effective leadership of the college president or other chief administrator. The involvement of these officials in the marketing of ISTPs exemplifies their belief that such programs are part of their institutional mission and enhances the credibility of the effort.

The elements of good program design are fundamental to the design of ISTPs. The paper enumerates the characteristics of good programs and focuses on tailoring program design elements to ISTPs. The preliminary phase of program design involves contact with the company and careful assessment of training needs. In the developmental phase, curriculum design, development of instructional materials, and selection of trainers are addressed. The techniques of task analysis and DACUM, the use of databases of instructional materials, and the selection of instructors with technical expertise as well as teaching ability are suggested. In the implementation phase, the training is delivered and results are evaluated. Evaluation at both the course and the program levels is recommended to determine whether the program has developed the desired competencies in a cost-effective and efficient manner.

A summary of the characteristics of effective programs identifies such key elements as clear communication among personnel in industry and education, instructional excellence, institutional flexibility, administrative support, and careful and thorough planning of each cooperative effort.

Industry-specific training programs are continuing to receive the enthusiastic support of governors and state legislators. Training needs are being recognized as a critical part of economic development policy; so most states now have agencies involved in IST and more institutions are developing programs tailored to industry needs. The nature of IST is changing, as increasing numbers of service occupations appear. However, quality in the workplace is always a priority, and effective industry-specific training programs are a means of achieving that goal.

The Need for Industry-Specific Training Programs

Industry-specific training, sometimes called "customized" training, is rapidly expanding throughout the United States. The goal of such training is to train or retrain employed workers so that U.S. firms can be more competitive in the changing world market (McGahey 1986). The world market is being influenced by major changes in production processes. Traditional hard labor activities are being replaced by capital and knowledge, "production processes are being redefined within industries and the industrial mix itself is being transformed into a more knowledge-intensive profile" (Stevens 1986b, p. 2).

The redefinition of industrial processes has resulted in higher levels of technology and automation within the workplace (Meyer 1985). As technology advances, two changes occur that affect the human resource requirements in manufacturing plants. First, the basic skill level required to operate the machinery is reduced considerably to the simple push of a button; however, there must be a tremendous increase in employee knowledge and understanding of what the machine does and how it fits into the rest of the manufacturing plant. Second, it is often not possible for a company to bring in a vendor every time equipment needs repairing, servicing, or for that matter, programming. This type of knowledge requires an entirely different set of skills. Therefore, industry needs much higher level skilled technicians and maintenance personnel than were previously required.

Automation is supplanting machine operators with programmable logic control devices, computer numerically controlled (CNC) machines, robots, and other flexible manufacturing devices. The installation of computer-managed equipment on an assembly line often makes it necessary for machine operators to have more training to help them repair sophisticated machinery. Employers in both manufacturing plants and offices are looking for people with higher levels of education. Modern industrialization and these new manufacturing concepts have changed the meaning of work.

Industry Needs

To compete with foreign auto makers, U.S. firms will have to produce the same number of cars with half the present number of workers. This means skilled workers must operate labor-saving, computer-integrated manufacturing equipment such as automated processing equipment, robots, and CNC machines. All of these changes--where we work and how we do it--are coming quickly.

Industry is finding it more and more difficult to recruit persons with these new skills. Persons with skills or experience in quality control, automated manufacturing, and printed and wired circuit boards are very difficult to find, as are chemical and mechanical engineers. Due to the unavailability of engineers and quality control personnel with wired circuit board experience, some

states have had to recruit from areas with a high concentration of technicians, such as the Research Triangle area in North Carolina.

Industry-specific training essentially includes a guarantee to existing or prospective industrial clients that a trained work force will be provided for their industry at minimal cost. In some states, this function is performed by the vocational education agency; in others, it is delegated to the industrial development agency.

Too often, industry and education, approaching the problem from different financial and structural viewpoints, see different means to a similar end. When this happens, industry has been known to complain that educators will not respond to their specific needs. For example, when an industrial plant needs five workers trained in a specific area of maintenance within 3 months, management does not want to hear, "We can teach them, but you have to send them to our 2-year evening maintenance program." Time is money, after all.

Industry-specific training programs usually last a shorter length of time than certificate programs. Shorter, more intense schedules mean that industry gets a quicker return for its investment, as do employees. Training programs must be custom-tailored to fit the needs of the client, rather than trying to fit the client's needs into a precast format (Kopecek and Clarke 1984).

Companies that work with industry-specific training programs find that they save time and money during the crucial start-up period. This is particularly true for companies that use preemployment training programs. Preemployment training programs enable industries to have employees trained for specific jobs so that when the expansion or the opening takes place, they are ready to go to work. This saves the company from having to hire the employees and then train them. Employees completing preemployment programs are certified to have the required basic entry-level skills.

Companies that use industry-specific training may have higher productivity and lower labor turnover rates. Again, this is particularly true when preemployment programs and a thorough screening process are used. Generally speaking, employees who are willing to come in on their own time and attend classes without pay have a stronger work ethic, are more highly motivated, and want to work.

Industry-specific training programs enable companies to recruit employees who have been thoroughly screened for academic skills, positive attitudes, and basic machine operator skills, and who have an understanding of company history and benefits. Companies employing this approach usually have an ongoing formal training program for maintenance, production, and supervisory personnel with a complete set of training materials for their production workers.

Factors Affecting Competition for Industry

How significant are human resources to the industrial prospect, and what are the factors that influence locations of new plants? High technology companies would be welcome new residents in many states. Many communities would like to attract a high technology industry. What attracts these new industries to an area?

Availability of Workers

A study by the Joint Economic Committee (U.S. Congress 1982) included questionnaires sent to 1,750 high technology companies (691 of whom responded), listing 12 factors thought to influence the choice of a region in which to locate. Labor skills and availability were overwhelmingly the greatest concerns of high technology companies. Two-thirds of the respondents rated this factor "very significant," and just under one-quarter rated it "significant." Labor costs were the second most important factor, and the tax climate was third.

The study also focused on factors that influenced the selection of a specific site within the chosen region. Again, the most important factor, availability of technical workers, was rated as more important than the availability of professional workers (U.S. Congress 1982).

George Berry, commissioner of the Georgia Department of Industry and Trade, compares industrial competition among the 50 states today to college football. "It is like every industry is the premier running back and every state is a football team trying to recruit him. It is an extraordinarily competitive situation." Of the 1985-86 outlook, Berry says, "We are dealing with a record number of prospects and we see no sign of slowing" (Walter 1985, p. 1B). Conway Data Inc., the Atlanta-based industrial development research firm, counted 754 major new and expanded plant announcements last year in the South Atlantic region. That was a gain of about 18 percent since 1983 and included 223 commitments in Florida, 140 in North Carolina, and 108 in Georgia (Walter 1985).

Mobility of Workers

Although respondents were not asked to explain the reasons for ranking the relative importance of technical and professional worker availability, there is evidence to indicate that the relative mobility of the two groups is a factor. A study by the National Science Foundation (1980) indicates that scientists and engineers are more mobile--that is, more likely to move to a job site—than are technical workers. According to the Vocational Education Division of the Georgia Department of Education, the majority of graduates from Georgia's vocational-technical schools find employment within 50 miles of the school that they attend (Morris 1985). It would be reasonable to assume companies choose an area well supplied with technical workers and plan to alleviate any shortage of professionals by recruiting from other areas. Human resources will be the livelihood of a new industry. They are also an important factor after its location.

Availability of Training

The 1984 *Business Week* survey showed that the importance of available labor with necessary skills increased from 48 percent of the firms surveyed in 1976 to 61 percent in 1984 (Reynolds 1984). Georgia's commitment and ability to train 110 tool and die employees for Pratt and Whitney was a major factor in that firm's decision to locate in Columbus, Georgia. The Pratt and Whitney plant is the most advanced, highly automated plant of its type in the world with over 100 robots and 100 different computers. Pratt and Whitney agreed to train the operators to push the buttons if Georgia would provide the technicians (Howard 1983).

Conclusion

The availability of customized or industry-specific training programs is a key factor in attracting and/or retaining business to an area. For those individuals wishing to know more about the topic, this publication provides an introduction to industry-specific training. Following an overview of how to develop the capacity needed to design and implement industry-specific programs, the importance of marketing is discussed. The next section relates the elements of program design to industry-specific training programs including characteristics of successful programs and barriers to program development. A discussion of trends concludes the paper. A section on resources is included for those wishing further information on specific aspects of the topic.

Developing Capacity in State and Local Organizations

Legislation and Organization

Customized training programs have been around for many years. Warmbrod and Faddis (1983) define customized job training as either—

- Short-term customized training for entry-level positions to aid start-up in new or expanding companies, with all or most of the training costs subsidized by the state; or
- Short- or long-term customized training for upgrading or retraining of existing employees of established companies with occasionally some small subsidies from the state, but most often with training offered to the company at cost by the college (p. 17).

The purpose of most quick-start customized training programs is industrial training. They generally do not buy equipment or make grants to industries. Quick-start programs began in the early 1960s in the southeastern states as industries began to expand and relocate from the northern, northeastern, and western states.

These expansions were prompted by several factors. First, there was a tremendous growth in population in the Southeast in the early 1960s. This trend is continuing. Second, in order to be more competitive with foreign and domestic industries, some companies needed to lower production costs. This could be accomplished by paying lower salaries, paying lower utility rates, having lower capital investment costs, modernizing facilities, and escaping burdensome labor costs.

The Southeast provided lower labor rates, abundant natural resources, and lower utility costs. As industries looked toward the Southeast, they found that the major weakness was the lack of a skilled work force. Customized industrial (quick-start) training programs were developed to provide this work force. These programs were designed to provide skilled training in a short period of time. Special legislation, funding, and staff were provided to meet this demand.

Whereas the initial motivation behind customized training programs was to attract industries from the northeastern United States, international competition today is stimulating the need for such programs. According to Stevens (1986a), international competition is influencing customized training programs of the 1990s in two ways. First, each state is competing for foreign-owned production facilities. Second, many states are using customized training programs to retain production facilities that might otherwise relocate, either to another state or another country.

Although a few new and expanding industry-specific training programs have been around for more than 20 years, it has not been until recently that attempts have been made to compile a summary of these programs. The first summary of programs was provided through the efforts of the

U.S. Office of Vocational and Adult Education (OVAE). OVAE sponsored a study of quick-start economic development programs that was conducted by Marshall Duval in 1983 (Reynolds 1984). His study indicated that several states were implementing industry-specific training programs. One result of the OVAE initiative was the appointment of a steering committee to organize a conference for industry-specific trainers across the United States.

The first national Quick-Start Training for Economic Development Conference was held on September 27-29, 1983, in Oklahoma City. Paul Weatherly, a pioneer in quick-start training, was the keynote speaker. His message was, "The industrial age is drawing to a close and the information age is upon us. To help vocational education make the changeover, we've got to start helping each other." Weatherly was also instrumental in organizing the nation's first industry training program in South Carolina in the early 1960s (Wilkerson 1983). The meeting was co-hosted by Hallard Randell, coordinator of Oklahoma's Training for Industry Program; Lee Cornelson, U.S. Department of Education; and the National Center for Research in Vocational Education.

As a result of this conference, plans were laid to form the National Association of Industry-Specific Training Programs (NAISTP). The purpose of the organization includes the following:

> (to) facilitate a working relationship of persons providing business and industry-specific training to new or expanding businesses or industries as an economic incentive by sharing training ideas, information and materials to provide quality training programs and at the same time enjoy friendly competition between states. (NAISTP 1984, p. 1)

A second survey of industry-specific training programs was conducted during 1985 and 1986 by David Stevens (1986a,b) of the University of Missouri-Columbia. From his analysis of activities reported by 42 states, Stevens concludes that industry-specific training programs have developed in "three waves of innovation" (Stevens 1986a, p. 5). He calls the first "the area vocational-technical school and community college control era," which began in 1957 (ibid.). The second, beginning in 1974, is the era in which control of state customized training was assumed by state executive agencies other than vocational or postsecondary education. The third and most recent era is characterized by the creation of public corporations whose purpose is to offer customized training with state funds; this era began in 1981.

Services Provided

The various state programs provide similar types of services, although the amount and delivery of those services differ considerably. Some of the services provided are as follows:

- Consultation with and training of production workers at the semiskilled, skilled, and technical levels
- Development of a detailed training plan tailored to the specific needs of the company
- Instructor training workshops for company personnel who will develop and deliver training programs
- Salary reimbursement for company personnel during the development of instructional materials
- Payment of instructors' wages
- Assistance in recruiting, screening, and testing potential employees

- Provision of training facilities and equipment
- Supervisory training for first-line supervisors and, in some cases, upper management supervisory training (Paul and Carlos 1981).

However, the nagging question remains about state strategies for the future. Because customized training is nearly taken for granted (with 44 states offering it in some form), the state that offers the ordinary training package no longer enjoys a competitive edge. In fact, according to Stevens (1986a), it is this competition among states that has led to the three waves of innovation described earlier. The question becomes one of "Should we put our development efforts into some other area of the employer's needs, or should we work to make our customized training program the best one offered?" To some extent, of course, both of these options must be addressed, but it is the contention of the author that a first-rate customized training program will be the key to the future for states wanting to attract and retain industry.

> The competition for industries among states and communities is such that the range of financial incentives to new industries has more or less standardized throughout the country. As a matter of fact, some states offer to match the tax and financial incentives by any other state. While the competition in tax incentives to new industries is more or less leveling off, industry training is the area where competition is now increasing. (Paul and Carlos 1981, p. I-7)

Quality and extent of training, however, differ considerably from state to state and depend largely on the method and location of delivery. Most states depend on vocational education institutions to plan, design, and deliver training services to industries. Georgia, Florida, North and South Carolina, Mississippi, and Oklahoma are just a few of the states that have established industry training programs closely coordinated with vocational education institutions to attract new and expanding industries. These institutions play a significant role in promoting economic development and attracting new business and industry to their communities. Many of the state programs have state industrial training coordinators with funds provided through the area vocational-technical schools, colleges, junior colleges, or universities who work directly with industries in the development and delivery of quality industrial training programs.

Funding

Adequate funds are required to organize and maintain an effective customized industry training program. The most common method of funding quick-start training programs for new and expanding industries is with 100 percent state funds; such states as Georgia, Alabama, South Carolina, Indiana, and Oklahoma use this method. Several states such as Mississippi combine federal and state funds earmarked for the reduction of unemployment in an attempt to maximize the job creation benefits. In most of these cases, federal funds are used during the on-the-job training portion of the program.

In recent years, several states have passed special purpose legislation in order to fund large retraining activities for existing employers. State customized training administrators have also been able to secure funds from a number of other sources in instances when the employer was important to the economic well-being of the state. Stevens (1986a) suggests that elected officials are apt to respond with financial support for customized training under one of the following two circumstances:

- When an existing employer of a large number of state residents raises the possibility that a production facility might be cut back or closed

- When a foreign country, or a domestic enterprise that is considering relocation, raises the possibility that a substantial increase in employment of the state's residents might occur. (p. 9)

Two states, California and Iowa, have created unique arrangements to fund their customized training programs. In California, the state unemployment insurance tax rate was cut by one-tenth of 1 percent, but at the same time a new state employment tax was created. Monies from the new tax were used to create the Employment Training Fund, which is administered by the Employment Training Panel. In Iowa, the legislature passed an industrial New Jobs Training Act. The act enables area schools to issue certificates in traditional financial markets to raise monies for training projects (Stevens 1986a).

Although states use a variety of methods to raise money for industry-specific training programs, administrators and elected officials view such efforts as an investment. The following words of Francis Tuttle, Oklahoma's former State Director of Vocational and Technical Education, represent this perspective:

> Oklahoma has never looked on its funding of quick-start training for industry as spending money—we're making an investment. Not only will that investment improve the quality of life for Oklahomans, but the state will recoup its investment in the form of collecting additional taxes, both from industry and its employees. (Wilkerson 1983, p. 28c)

Commitment and Flexibility

Other variables that have been found to be especially useful in facilitating effective job creation programs are "business climate, characteristics of potential employees, and the economic development potential of a given area" (Bushnell 1980, p. 63). Business climate is generally understood to reflect the attitudes of government officials, local community leaders, and the public. Thus, economic development requires a team effort.

> A business firm's decision to locate a plant or expand its employment depends on political factors as well; strong interest on the part of key state government officials, such as the governor, does contribute significantly to a state's image regarding private industry. When the governor is an active proponent of economic development, such as Governor Riley of South Carolina, that image contributes favorably to the state's business climate. (Bushnell 1980, p. 64)

Conclusion

Most states have become active in supporting customized training programs. As a result, Stevens (1986a) observes that the following changes have occurred:

- Cost of doing business has passed from the private sector to the states.
- New "spending coalitions" have been created in the form of those who have a vested interest in the new activity.
- Both the states and private-sector interests have developed a taste for collaborative opportunities; movement along a learning curve of state investment opportunities has begun. (p. 4)

Marketing Industry-Specific Training Programs

Just as industries are facing tough competition in the international arena, states are dealing with increased competition for attracting resources for economic development, and educational institutions must contend with widespread availability of training opportunities and dwindling numbers of traditional students. Effective marketing of industry-specific training programs is essential to meeting this competition.

The Marketing Environment

Marketing can be defined as the coordination of organizational resources and functions to attain organizational goals effectively (Pride and Ferrell 1985). This coordination effort requires a high level of knowledge concerning the marketing environment: the client, the internal situation, and the external situation.

Training providers must get to know the client company by learning about its operations, products, customers, and competition. Annual reports, credit reports, and company officer biographies are sources of such information (Luther 1984). The client's problems and needs must be identified. This information can be gathered during the preliminary phase of program design, which is discussed in more detail in the next chapter. The client's current training situation and goals should be investigated. Kaplan (1984) recommends observation, personal interviews, and questionnaires as methods of collecting the necessary data.

Awareness of the training provider's internal situation is the second important piece of knowledge. Institutional capacity should be assessed in terms of such elements as institutional commitment and cooperation, organizational structure and communication channels, flexibility in scheduling and location of courses, and most important, the expertise and continuing development of instructors.

The external situation includes such environmental factors as the legal, social, economic, technological, and demographic conditions of the state and locality. The economic developer or training provider should have specific information on such topics as the number of persons employed and trained in specific skill areas, the percentage of union companies and employees in the state and community, estimated entry-level and average salary by occupation, the number of persons commuting to work in the community, the distance and location from which they are commuting, the unemployment rate locally and statewide, the population, and the average per capita income and education level of the community.

The client must be convinced that an ample supply of skilled workers exists in the area. The client must also be convinced that there are adequate elementary, secondary, and postsecondary

institutions to support the families of employees. The client frequently wants to know how many entrants there have been in the work force and how many potential employees there are in the community.

Prevailing wage rates and fringe benefits are also issues about which program marketers should be knowledgeable. Because statewide labor and wage surveys are often too broad for the specific communities being considered, regular labor rate surveys should be conducted in the community.

Labor-management relations and state laws and regulations affecting them should also be investigated. The attitude of the community is also a very important factor. Special circumstances often affect the local labor supply, such as stability and competition for labor. Similar industries tend to group close together. Although this creates competition, it also stimulates the labor market and provides a larger base of specialized skills. Developers and trainers should maintain a list of employer contacts who can provide information on the local business climate, work ethic, and labor supply.

Marketing Considerations

Although Luther (1984) sees in the industrial market for training a vast opportunity for education, a number of barriers must be overcome before that market can be tapped. Following are some considerations for marketing programs to industry.

A basic marketing principle is to give the customers what they want. Customized training programs must respond to exact industry needs, rather than trying to fit those needs into existing institutional molds. Paulsen (1981) recommends that courses be (1) highly focused and formulated with the assistance of industry advisors, (2) individualized and competency based, and (3) short, containing self-study materials when possible.

Industry training programs tend to emphasize content over effective delivery. Training is often viewed pragmatically as a means of accomplishing goals and expected to be limited, specific, economical, and efficient. Training providers should present the results of successful instructional delivery methods that meet those criteria.

Conflicts between academic and industrial priorities may arise, for example, over the issues of academic freedom and autonomy, constraints on time and other resources, and rigid organizational policies (Johnson 1984). Program marketers should be prepared to address these issues and to demonstrate the institution's willingness and ability to be flexible and responsive, developing an atmosphere of mutual trust through clear communication.

Warmbrod and Faddis (1983) suggest the following strategies to enhance a marketing program: develop a reputation for successful delivery of promises; document productivity improvements and decreases in turnover rates that result from training programs; involve satisfied customers when approaching new prospects; and speak the industry's language, listen well, and avoid academic jargon. Key marketing staff could be persons who have owned their own businesses or previously worked in industry.

Marketing Strategies

The success of an industry-specific training program requires above all strong institutional commitment from all levels of administration as well as instructional staff. Warmbrod, Persavich, and L'Angelle (1981) found that strong leadership of the college president is a critical element. Breakfast meetings between top-level academic administrators and the chief executive officers and other corporate decision makers from the target companies are a means of introducing the two groups to one another, of demonstrating the institution's support for the program, and of gathering information about the company's history, structure, and needs. The involvement of these administrators exemplifies their belief that training programs are a part of their institutional mission and enhance the credibility of the effort.

Warmbrod and Faddis (1983) cite two different approaches to marketing. South Oklahoma City Junior College (SOCJC) decentralizes marketing responsibilities by involving the dean of community services, the dean of career development and industrial relations, and the business-industry coordinator, whereas the faculty have major responsibility for developing training opportunities with industry in their own subject areas. Triton College, on the other hand, has an aggressive marketing office that uses traditional marketing techniques such as catchy slogans, direct mail, telemarketing follow-ups, and media advertising.

Designing and Implementing Industry-Specific Training Programs

The topic of designing and implementing industry-specific training programs has been treated in a number of publications. The elements of good program design, such as needs assessment, objective setting, curriculum development, implementation, and evaluation, are fundamental to the design of industry-specific training programs. Rather than providing general guidelines for carrying out these elements, this section focuses on how they may need to be tailored in planning industry-specific training programs. It also enumerates characteristics of good programs as well as barriers that may hamper program development and implementation.

Project Design Elements and Industry-Specific Training Programs

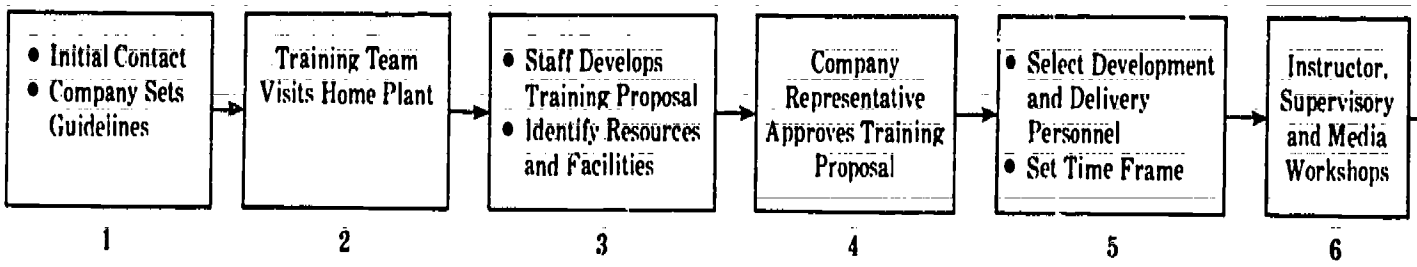
Industry-specific training programs are conducted in three phases: preliminary, developmental, and implementation. In the preliminary phase, the overall needs of the company and customized training guidelines are addressed. During the developmental phase, specifics of the training program are developed. The implementation phase is concerned with finalizing and delivering the training as well as evaluating the results. Figure 1 provides an illustration of the progress of a typical customized industrial training program. The phases and the elements associated with each are described in more detail.

Preliminary Phase

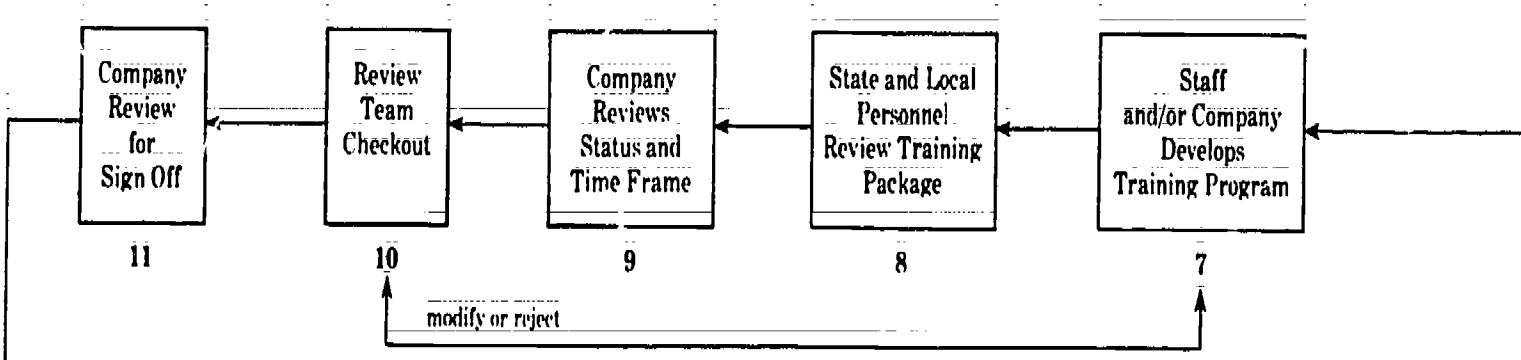
The preliminary phase includes contacting the company and assessing its training needs. The initial contact with the company may include a telephone call, an office meeting, or a meeting at the prospective client's company. The importance of this initial contact in the outcome of the training program cannot be overemphasized. David B. Luther (1984), vice-president of the Quality, Consumer, and Industry Group at Corning Glass Works in New York, views this contact from the perspective of the company and recommends two essential steps in making the initial contact. The first, which should be completed before the contact is made, is to become knowledgeable about the company. This process involves doing some homework to learn about the business, its products, and its competition. According to Luther, in order "to know the customer's needs, you must know the customer" (p. 80). The second step involves learning about the customer's problems and needs during the first meeting. This step is accomplished by allowing the company representative to describe the company's problems and finding out what the company wants to accomplish through training.

QUICK START PROJECT MANAGEMENT

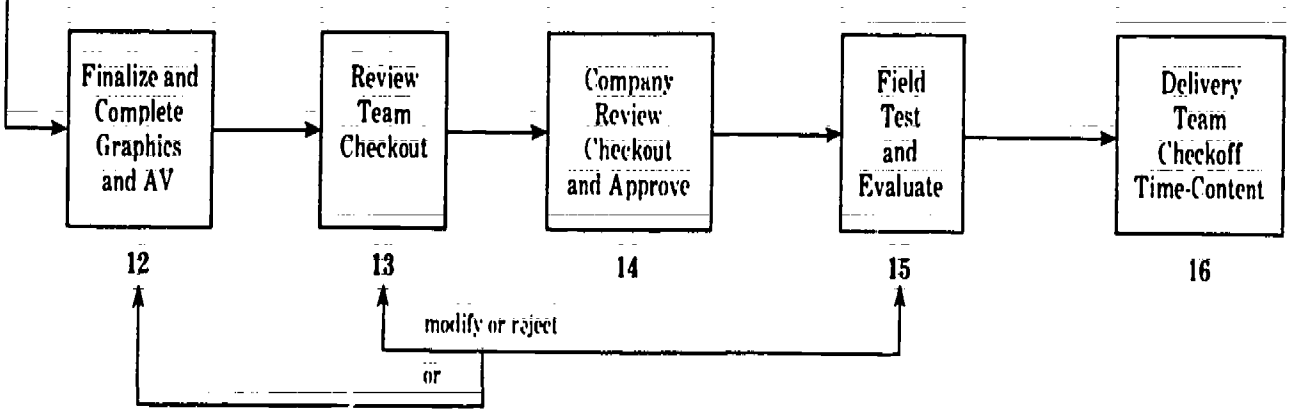
PRELIMINARY: Overall needs of the company and customized training guidelines are addressed. A letter of intent/agreement is made at the state level to establish and identify the areas and the scope of assistance from the state.



DEVELOPMENTAL: Specifics of the training program are developed and presented to the company for review and approval with regard to objectives of the training program.



IMPLEMENTATION: Final development and delivery formats of the training program are planned and developed by customized training personnel and approved by the company. Delivery of the training program for new employees is ready.



Source: Georgia State Board of Postsecondary Vocational Education

Figure 1. Example of industry-specific training program development

Learning about the customer's problems and needs through careful listening leads into the needs assessment element of the program planning process. Every company will have different training needs. Although formal needs assessments such as observation, personal interviews, and questionnaires are frequently conducted to determine training needs, "this time-honored approach . . . may be changing" (Kaplan 1984, p. 87). Some training providers are beginning to use a more informal approach to needs assessment that consists of listening to company personnel, making suggestions, and then suggesting class outlines or a curriculum. This approach, which seems to work well, is based on the assumption that a company generally knows what it needs (Warmbrod and Faddis 1983).

The preliminary phase of the program development process should conclude with the development of a general plan or proposal for conducting the training. Luther (1984) refers to this as "developing a strategy for satisfying the customer's need" (p. 80). Among other things, the plan should include a rationale for the training; a description of training needs; projections of required resources, including materials, supplies, and equipment; and relevant information about the company such as job classifications involved (Paul and Carlos 1981). When the company approves the proposal, the developmental phase of the design process is ready to begin.

Developmental Phase

The developmental phase is concerned with developing the specifics of the training program. During this phase, such elements as curriculum design, the development or selection of instructional materials, and selection/recruitment of trainers are addressed.

Because training programs vary, curriculum design requirements range widely. When training consists of a single course, the instructor is usually responsible for designing and developing the curriculum. When the training program is more complex, involving multiple offerings, the services of a knowledgeable curriculum coordinator may be required (Kaplan 1984). Regardless of who is responsible for curriculum development, it is generally agreed that training programs should be competency based (Kaplan 1984; Paul and Carlos 1981).

Developing a competency-based curriculum usually requires a task or occupational analysis. A task analysis is used to determine the nature and extent of skills, knowledge, and information a trainee needs to acquire in order to perform at an acceptable level on the job. It includes procedural and technical information needed to perform a task; tools, equipment, and supplies needed to assist with the task performance; and a sequencing of tasks to complete the job under analysis (Paul and Carlos 1981).

Individuals interested in performing a task or occupational analysis might consider the DACUM (Developing a Curriculum) process. DACUM is one type of occupational analysis that can be used for determining which competencies should be included in a curriculum. According to Day (1984), "DACUM is based on three assumptions: (1) expert workers can define and describe their jobs more accurately than anyone else; (2) any job can be effectively described in terms of the tasks that successful workers in that occupation perform; and (3) all tasks, in order to be performed correctly, demand certain knowledge and attitudes from workers" (p. 46). For a more complete description of how the DACUM process was used in the steel industry, readers are referred to Day (1984).

Once the curriculum is designed, curriculum or instructional materials need to be developed or selected. There are many existing instructional materials that may be adopted or adapted for use in

training programs. Good sources for these materials are the National Network for Curriculum Coordination in Vocational and Technical Education's Curriculum Coordination Centers and the ERIC (Educational Resources Information Center) and VECM (Vocational Education Curriculum Materials) databases. Frequently, however, customized training requires that new instructional materials be developed. The American Vocational Association (Paul and Carlos 1981) has provided the following list of helpful hints for developing training materials based on task analyses:

- Collect and compile the content from the task analysis
- Synthesize company or other applicable materials
- Conduct additional task analyses, if necessary
- Formulate training objectives
- Outline the intent and nature of instructional procedures
- Sequence learner activities and illustrate with supporting materials
- Divide the manual into self-sustaining units of instruction
- Review with the company (p. III-14)

Another key element of the developmental phase is the selection and recruitment of instructors. Instructors should be selected with care. They should not only be knowledgeable about the subject but they should also understand how to work with adult learners. It is also highly desirable for trainers to have work experience for "nothing hurts the credibility of a program more than the presentation of 'theory' without the reinforcement of practical experience" (Kaplan 1984, p. 86).

In providing customized training programs, most states have found it best to use company personnel as instructors. There are three reasons behind this approach. First, industrial personnel have expertise. Technicians already know the process and have a good understanding of what is to be taught. Second, students or employees are more likely to be attentive when the instructor is one of the company's employees, possibly a supervisor, or when preemployment training is used, a potential supervisor. Third, because company personnel already understand the material and product to be presented, it is not necessary to train an outside instructor.

> [I]ndustry prefers, if not mandates, a faculty that is not "ivory tower" or theoretical in approach, thinking, or delivery. Instruction needs to be oriented toward application and job relevance. Faculty typically need to have had experience on particular types of equipment or in very specialized operations to be most effective. Usually, full-time faculty do not have this directly applicable experience, or their schedule does not permit them to participate. (Kopecek and Clarke 1984, p. 21)

All new business and industry instructors should be given train-the-trainer sessions. Some suggested areas to be covered in a train-the-trainer course are as follows:

- Writing performance-based objectives including the selection and sequencing of job tasks
- Developing course agendas and lesson plans that can be used to guide the instructional process
- Learning to use teaching aids, such as audiovisual materials and equipment, appropriately

- Learning how to plan classroom teaching that will reinforce correct use of newly acquired skills and knowledge on the job
- Learning how to present new material to adult learners (Paul and Carlos 1981)

Although the elements in the developmental phase of planning industry-specific training programs have been discussed separately, they are in fact quite interrelated. Frequently, trainers are selected first and given the responsibility for curriculum and instructional materials development and selection. Trainers may also participate with others in these processes. Finally, if preexisting training packages or curriculum materials are used, the curriculum development process is omitted altogether. Once the tasks of the developmental phase are completed, the program implementation phase begins.

Implementation Phase

During the implementation phase, the training program is delivered and the results are evaluated. Customized training programs should be continually evaluated and revised as necessary when new equipment and technology changes occur. Evaluation should occur on two levels: the course level and the program level.

Although the courses offered in a customized training program may or may not be credit-based, all participants should take a pre- and posttest combination to measure the effectiveness of the course in developing the desired competencies. However, care must be taken that the tests unquestionably measure job-required competencies only, according to federal regulation, to avoid bias or discrimination claims (Kopecek and Clarke 1984). Thus, if literacy is not a job-required competency, participants cannot be forced to take a written test.

The courses may be doing a great job of teaching the desired competencies, yet poor administration or financial problems could keep the overall program from being a success. Thus, it is necessary to evaluate on the program level as well. Average cost per trainee and average cost per hire are two important figures that should be determined to aid evaluation of the program. In addition, the estimated return in the form of wages paid to state residents, increased tax revenues, and higher demand for various service industries must be measured (Stevens 1986a). It is impossible to pinpoint exactly the impact of customized training programs on state economic development, but these estimated figures should provide some idea of how well the program is working.

In addition to economic benefits, other areas of operation should be evaluated as well. These include rate of participation in training, the effectiveness of the liaison between state and industry, and increase in jobs for the population as a whole and for chronically unemployed or underemployed groups. Another question for careful evaluative consideration is whether the agency administering the training program is the best agency for the job. Although the states using customized training as an economic development tool usually house it administratively in one agency, that agency varies from the economic development agency (in 20 states) to the vocational education agency to a public corporation (Stevens 1986a). Thus, when evaluating program administration, it may be helpful to look at how other states do it.

Because the program development process is cyclical, results of both course and program evaluation can be used for program improvement. The results should be made available to appropriate individuals so that they can be used in decision making about future courses and the further development of the total program.

Individuals interested in designing evaluations for industry-specific programs will find *Evaluating Short-term Skill Training* (Dubravcic, Chinien, and Pratzner 1988) useful. Written for the trainer or administrator whose experience in evaluation is limited, this publication discusses key administrative concerns in planning and implementing evaluation and presents guidelines for selecting an evaluation approach.

Characteristics of Successful Programs and Barriers to Program Development

Knowledge of the program development process is one aspect of planning and implementing industry-based programs. However, it is also helpful if program developers are aware of the characteristics of successful programs as well as deterrents that inhibit program development. Two studies conducted by staff at the National Center for Research in Vocational Education have identified successful program characteristics as well as barriers that may hamper program development and implementation.

Through an analysis of reports of exemplary programs and practices of industry/education collaboration, Warmbrod, Persavich, and L'Angelle (1981) identified 11 elements that characterize successful programs: (1) clear communication among key personnel in industry and education, (2) teaching excellence, (3) institutional flexibility, (4) high quality program offerings, (5) active advisory committees, (6) quick response time from educators in order to meet industry needs, (7) recognition of mutual need, (8) support of administrators and teaching staff within the educational institution, (9) careful and thorough planning in each cooperative effort, (10) a clearly written agreement or contract, and (11) continued evaluation in order to update and improve the program.

In their study of successful postsecondary programs designed to retrain and upgrade workers, Warmbrod and Faddis (1983) analyzed the results of five case study visits in order to identify barriers encountered by college staff in their efforts to participate in economic development. A total of 39 barriers, which were clustered into 10 categories, were identified. Although many of these barriers relate specifically to postsecondary education settings, several are general and need to be addressed by any provider of industry-based training programs. Barriers in this category include the following:

- State funding for customized training exists, but it is too often limited by strict eligibility restrictions, thereby reducing its effectiveness.
- The will for cooperation between state agencies and educational institutions in economic development efforts exists, but poor or muddled communications hamper those efforts.
- Poor or insufficient communications and articulation among state and local educational institutions often hamper their efforts to improve their economic development outreach.
- Formal contracts mandated for some states' customized training programs for industry may require many signatures of various educational and state officials.
- Credit courses, whether customized or not, require time-consuming course approval by the state board of regents or other state education agency.
- The state board of regents requires that employer demand be shown when seeking course or program approval, even though the course may address training needs that are only emerging.

- Problems arise in finding enough reliable information on changing job demand, high-technology trends, changing occupations, changing regional economic patterns, shifting demographics, and so forth in order to make intelligent decisions about both short- and long-range institutional needs and economic development programs.
- Changing technologies continually render current programs obsolete.
- Poor communication between business and industry and the program providers keeps them from becoming informed about each other's needs and services.
- It is often difficult to develop effective customized training courses on short notice.
- Educational institutions may have problems finding funds to provide quick response in developing and implementing customized training as the need arises.
- The danger of a provider overpromising on what it can actually deliver regarding customized training exists.
- Companies may collaborate with a provider on setting up customized training for their employees and then have to back out of the arrangement.
- Course developers may find it difficult to make sure that customized courses teach the skills that trainees need and companies want.
- Course designers may run into problems with persons taking customized or other special training who do not have sufficient basic skills to learn the more advanced skills being taught.
- Adult students demand more in terms of training content and instructional methodology than do students coming directly from high school.
- Finding qualified instructors--often on short notice--to teach customized courses is frequently difficult.

There is a similarity between the characteristics of successful programs and deterrents or barriers to program development and implementation. It is evident that successful industry-based programs require, among other things, clear communication at all levels, flexibility, excellent instructional staff, and up-to-date, high-quality program offerings.

Trends in Industry-Specific Training

Industry-specific or customized training programs are continuing to receive the enthusiastic support of governors and state legislators as states compete with each other for high-quality employment opportunities (Stevens 1986a). An important by-product of customized training programs has been the recognition that training needs are a critical part of economic development policy, especially for job retention.

The following trends have been observed:

- Most states now have industry-specific training programs. Increasing economic pressures will cause states to expand their programs to attract new business and industry and expand existing industries.

- More vocational and technical education institutions will develop programs tailored to business and industry needs. Competition for students will be a major driving force.

- The nature of industry-specific training is changing. Training in the 1960s was directed primarily toward operators; toward technicians in the 1970s; and toward the highly skilled automation and robotics technicians in the 1980s. However, at the same time that the need exists for training highly skilled technicians, there are increasing numbers of service industries appearing (e.g., computer data entry, processing credit cards). There is movement from a manufacturing to a service society. Although jobs performed by service industry workers may not require highly technical skills, they do require basic training.

- Quality in the workplace is once again of high priority and must be reflected in the depth and effectiveness of the customized training programs. For examples of high-need skill areas, see Pratzner and Russell (1984).

Resources

The following annotated list describes sources of further information about industry-specific training programs.

Carlos, E. ***Developing a Strategy. Supporting Economic Development: A Guide for Vocational Educators.*** Harrisburg: Bureau of Vocational and Technical Education, Pennsylvania State Department of Education, 1983. 37 pp. (ERIC Document Reproduction Service No. ED 240 281).

> This handbook offers vocational educators several suggestions for becoming active partners in their community's economic development activities. It is intended as a tool to use for coordinating activities between vocational educators and representatives of industry, government, and labor. It discusses forming partnerships between these groups and examines the role and responsibilities of the industry/education coordinator.

Dubravcic, E. V.; Chinien, C. A.; and Pratzner, F. C. ***Evaluating Short-Term Skill Training.*** Research and Development Series no. 261. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986. 65 pp. (ERIC Document Reproduction Service No. ED 268 373).

> This guidebook compares short- and long-term training programs in terms of duration, philosophy, organizational context, purpose, clientele, instructional staff, curriculum, and linkage with employers; reviews evaluation methods; discusses key administrative concerns in planning and implementing evaluation; presents guidelines for selecting an evaluation approach; and describes an abbreviated method of evaluating very short programs.

Frey, D. N. ***The Economy, Productivity, and Training--A CEO's View.*** Occasional Paper no. 88. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982. 16 pp. (ERIC Document Reproduction Service No. ED 225 001).

> The way resources are deployed to educate Americans will affect, as never before, productivity, the economy, and the quality of life. To maintain the present standard of living, Americans will be dependent on a continuous infusion of scientific breakthroughs and productivity-enhancing technology. Periodic upgrading of skills will be a necessity for more and more workers.

How to Custom Design Training for Business and Industry. Elgin, IL: Elgin Community College, 1983. 39 pp. (ERIC Document Reproduction Service No. ED 237 774).

This booklet outlines the process used by Elgin Community College to custom design training for business and industry. The implementation of the process, beginning with the initial request for training, is addressed. It also contains a description of the 11 major steps that are implemented in the model process, with samples of forms that are used.

Johnson, L. G. ***The High-Technology Connection: Academic/Industrial Cooperation for Economic Growth.*** ASHE-ERIC Higher Education Research Report no. 6. Washington, DC: Association for the Study of Higher Education and ERIC Clearinghouse on Higher Education, 1984. 129 pp. (ERIC Document Reproduction Service No. ED 255 130).

Cooperative arrangements between academic institutions and industry are examined, with attention to linkages in high technology research and development (R&D), the commercial application of R&D (technology transfer), and the preparation and continuing development of scientific and engineering personnel. Incentives and barriers to campus/corporate involvements are identified.

Kopecek, R. J., and Clarke, R. G., eds. ***Customized Job Training for Business and Industry. New Directions for Community Colleges no. 48.*** San Francisco: Jossey-Bass, Inc., 1984. 119 pp. (ERIC Document Reproduction Service No. ED 252 267).

This sourcebook identifies issues in program decision making; discusses the centralized organizational model; examines a successful government-education-industry collaboration; describes the benefits of legislative, corporate, and educational cooperation in terms of increased worker productivity and improved college-employer relations; and reviews specific practices to ensure customized training program effectiveness.

Leach, J. A., and Sanders, C. S. ***Education for Employment. Planning for Economic Development: A Strategic Approach.*** Urbana: Department of Vocational and Technical Education, University of Illinois, 1983. 36 pp. (ERIC Document Reproduction Service No. ED 237 747).

This booklet provides business, industry, labor, government, and educational groups with an overview of the economic development process as well as ideas for planning and implementing coordinated economic development activities. It identifies three major goals for economic development and defines the roles of the groups involved.

Lloyd, K. ***The Federal Perspective on Vocational Education's Role in Economic Revitalization and Productivity.*** Occasional Paper no. 91. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983. 20 pp. (ERIC Document Reproduction Service No. ED 227 271).

The Vocational Education Act needs to be refocused in the direction of cooperation between schools and employers and provision of federal incentives without federal coercion. One of the greatest needs in promoting productivity is to improve the delivery of vocational education skills and vocational education students to the employer.

Long, J. P. ***Economic Development and the Community College.*** Research and Development Series no. 251. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984. 79 pp. (ERIC Document Reproduction Service No. ED 256 932).

This report looks at what 2-year postsecondary institutions can do as participants in economic development at the local, state, and national levels. Focuses on how community, junior, and technical colleges work together at the state level to pursue economic development in states with varying emphases and levels of commitment to organized economic development. Relevant activity at the national level is also reviewed.

McGahey, R. ***An Evaluation of New York State's Employer-Specific Skill Training Grant Program.*** New York: Urban Research Center, New York University, 1986. 58 pp.

This report assesses the New York State Department of Education's Employer-Specific Skill Training Grant program and offers some suggestions regarding future funding and organization. Findings include (1) the program enjoys a high degree of approval from participating employers; (2) program effectiveness is limited due to lack of coordination with other efforts; and (3) the program is inadequately and inconsistently funded.

Miller, T. W. ***The Business and Industry Perspective on U.S. Productivity: Implications for Vocational Education.*** Occasional Paper no. 82. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982. 23 pp. (ERIC Document Reproduction Service No. ED 222 700).

Describes the Control Data Corporation's response to the need for innovative and effective training techniques: a competency-based computerized education system called PLATO, a program to help chronically unemployed youth find and keep jobs, a campaign to train and place disadvantaged people in skilled career positions, and a program that allows the disabled and/or homebound to work at home via computer terminals.

Paul, K. K., and Carlos, E. A. ***Vocational Educators' Handbook for Economic Development.*** Arlington, VA: American Vocational Association, 1981. 133 pp. (ERIC Document Reproduction Service No. ED 209 535).

This "how-to" manual provides information and specific strategies for vocational educators who want to become involved in the economic development/job creation process. It is especially designed for the novice business and industry liaison or coordinator. The manual includes sections on the job creation process and planning an industry training program.

Paul, K. K.; Carlos, E. A.; and Bushnell, D. S. ***Vocational Education and Eco nomic Development Case Studies.*** Arlington, VA: American Vocational Association, 1982. 152 pp.

Seventeen sites were studied to identify the vocational education programs that support and link with economic development. A brief description of each program is reported. These descriptions include program organization, coordination, funding sources, delivery systems, and program results.

Paulsen, R. ***Short Term Skill Training. Alternative Approaches.*** Information Series no. 222. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981. 28 pp. (ERIC Document Reproduction Service No. ED 199 445).

Examines how short-term skill training programs can provide an opportunity for postsecondary vocational institutions to respond to the human resource needs of their communities. Focuses on policy issues involved in the provision of short-term training by postsecondary vocational institutions. Mechanisms for acquiring funding, ensuring quality control, maintaining accreditation, and awarding earned credit are also examined.

Quick Start. Georgia Industrual Training Services. Procedures Guide. Atlanta: Georgia State Board of Postsecondary Vocational Education, 1986. 162 pp.

This guide contains the necessary administrative guidelines and procedures for conducting Georgia's Quick Start Program. In addition, it explains the various services provided by the Quick Start Program. It is an operational guide and a source of reference for personnel engaged in the development and delivery of Quick Start training programs for businesses and industries in Georgia.

Quick Start. Georgia Industrial Training Services. Strategic Planning for Your Service Area. Atlanta: Georgia State Board of Postsecondary Vocational Education, 1986. 95 pp.

This service area manual is intended to be used by local school personnel who are primarily responsible for the delivery of training programs and other services in the service areas of the schools throughout Georgia. The manual discusses program implementation and funding sources.

Scharlatt, H. "Customized Training: Great Work if You Can Get It." ***Training*** 20, no. 8 (August 1983): 42-44.

The advantages and disadvantages of various customized training programs are identified. Points to consider when purchasing a customized program are presented, such as the amount of customizing, origination of the program's objectives, trying out programs before purchase, and training for the buyer's trainers.

Special Report. Vocational and Technical Education Industrial Services: Training Workers for New and Expanding Industry. Jackson: Division of Vocational-Technical Education, Mississippi Department of Education, 1983. 94 pp.

This report includes specific case histories showing how the cooperation between Mississippi state agencies and important corporate enterprises has successfully provided trained workers in many fields. It examines vocational-technical training for industry, use of videotape, classrooms on wheels to teach computerized numerical control, and supervisory training courses.

Stevens, D. W. ***State Industry-Specific Training Programs: 1986.*** Columbia: University of Missouri-Columbia, 1986. 42 pp.

This report focuses on the skill-training activities subsidized by the various states and the instructional arrangements through which these activities are conducted. It also examines

three waves of innovation occurring in schools, state executive agencies, and public corporations.

Teaching for Tomorrow. "Quick Start-Up" Vocational Training Programs. Tucson: Department of Business and Career Education, University of Arizona, 1979. 81 pp. (ERIC Document Reproduction Service No. ED 202 997).

Describes the economic outlook of Arizona and the nation as a whole, gives information on nationwide skill centers and their efforts to meet industry's needs, and makes recommendations for a program that would be effective in answering future labor needs.

Training and Economic Development: The Impact of Industry-Specific Training on Business and the Economy of New York State. Albany: Office of Occupational and Continuing Education, New York State Education Department, 1984. 77 pp. (ERIC Document Reproduction Service No. ED 248 342).

Researchers interviewed representatives of businesses, industries, unions, and educational institutions involved in training programs in order to determine the effectiveness of the program themselves and the methods used to evaluate them. It was concluded that the Short-Term Program for Economic Development resulted in increases in productivity and quality or quantity of goods and services for the participating companies.

Training Programs for Small Business. Report on Funded Projects. Capsule Report 86-07-CR-B. Albany: Subcommittee on Education and Training, New York State Interagency Small Business Task Force, 1986. 31 pp.

Fourteen projects are presented that have provided training for entry-level positions in the financial services, supervisory uses of time and motion studies and methods and advantages of computerization to employees and proprietors of agricultural businesses, machine manufacturing companies, stores in shopping malls, and other types of small businesses. Program objectives, key attributes, obstacles, and recommendations are included.

Tuttle, F. T., and Wall, J. E. ***Revitalizing Communities through Industry Services Programs.*** Critical Issues Series, no. 2. Washington, DC: American Vocational Association, 1979. 32 pp. (ERIC Document Reproduction Service No. ED 182 476).

Describes some of the basic features of state industry services programs, particularly those related to job training. It seeks to answer the following questions: How does an industry services program differ from more traditional vocational education programs? What types of training are provided? Who benefits? How are the activities of industry, state or local agencies, and community groups coordinated?

Warmbrod, C. P. and Faddis, C. R. ***Retraining and Upgrading Workers: A Guide for Postsecondary Educators.*** Research and Development Series no. 235. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983. 219 pp. (ERIC Document Reproduction Service No. ED 228 458).

Provides an in-depth look at successful upgrading and retraining programs in colleges in diverse situations across the country. Contains case studies of upgrading and retraining

programs at various institutions. Various barriers and solutions to developing successful retraining programs are examined, including state and local linkages for economic development, course approval systems, and college forecasting and planning.

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