DOCUMENT RESUME

ED 336 567 CE 058 948

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TITLE Vocational Education for Special Populations: Recommendations for Improving State Policy.
INSTITUTION National Center for Research in Vocational Education, Berkeley, CA.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE Sep 91
CONTRACT V051A80004-88A
NOTE 65p.
AVAILABLE FROM National Center for Research in Vocational Education Materials Distribution Service, Horrabin Hall 46, Western Illinois University, Macomb, IL 61455 (order no. MDS-031: $3.25).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Access to Education; Demonstration Programs; Educational Legislation; Educational Research; Employment Patterns; Enrollment; Federal Legislation; Literature Reviews; Mainstreaming; *Outcomes of Education; Postsecondary Education; *Program Effectiveness; Public Policy; Racial Integration; Secondary Education; Sex Discrimination; Sex Fairness; *Special Needs Students; State Government; *Vocational Education

ABSTRACT

Three aspects of equity embedded in the Carl D. Perkins Vocational Education Act of 1984 were examined through a review of the research literature: access, program effects, and student outcomes. The analysis suggested that access to vocational education programs for disabled students improved in recent years, disadvantaged and poor students continued to be significantly overrepresented in many programs, and limited-English-proficient students had very little access to vocational education. Little empirical evidence documented effects of different program approaches or components. A broadly defined list of "components" or "practices" that tended to be supported by case study data was developed, although studies frequently cautioned that much of what was observed was unique to the program setting. Administrative support and adequate financial support appeared to be important. In regard to student outcomes, the differentials in earnings and labor force participation between majority groups and special populations completing high school vocational education programs appeared to be reduced. The following strategies were outlined to enhance access to and attainment of equitable outcomes for vocational special needs students: (1) use of an access ratio; (2) development of guidelines that incorporate components of effective programs; (3) development of computer-based tracking systems; and (4) development of performance outcomes. (82 references) (YLB)

VOCATIONAL EDUCATION FOR SPECIAL POPULATIONS: RECOMMENDATIONS FOR IMPROVING STATE POLICY

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Supported by
The Office of Vocational and Adult Education,
U.S. Department of Education

September, 1991 MDS-031

This publication is available from the:

National Center for Research in Vocational Education
Materials Distribution Service
Western Illinois University
46 Horrabin Hall
Macomb, IL 61455

800-637-7652 (Toll Free)

FUNDING INFORMATION

Project Title:	National Center for Research in Vocational Education
Grant Number:	V051A80004-88A
Act under which Funds Administered:	Carl D. Perkins Vocational Education Act P.L. 98-524
Source of Grant:	Office of Vocational and Adult Education U.S. Department of Education Washington, DC 20202
Grantee:	The Regents of the University of California National Center for Research in Vocational Education 1995 University Avenue, Suite 375 Berkeley, CA 94704
Director:	Charles S. Benson
Percent of Total Grant Financed by Federal Money:	100%
Dollar Amount of Federal Funds for Grant:	$4,000,000
Disclaimer:	This publication was prepared pursuant to a grant with the Office of Vocational and Adult Education, U.S. Department of Education. Grantees undertaking such projects under government sponsorship are encouraged to express freely their judgement 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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INTRODUCTION

The Carl D. Perkins Vocational Education Act of 1984 and the Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 provide an extension of a twenty-five-year federal interest in strengthening equity through vocational education programs. Clearly, one of the central purposes of both pieces of legislation is to improve the employment and further education prospects for a variety of individuals who face significant barriers to succeeding in the labor market. Both laws provided sweeping changes in the allocation and distribution of basic state grant funds. Several expanded provisions related to serving disadvantaged, disabled, and limited-English proficient (LEP) students were included in various sections of both laws. Section 204(c) of the Perkins Act, for example, mandated that each local education agency operating programs must provide the following set of services to all students:

- assessment of interests, abilities, and special needs;
- appropriate support services based on the information provided through the assessment;
- guidance, counseling, and career development services; and
- special services which facilitate transition to either employment or further education. (P.L. 98-524, Title II, 204c)

According to the 1990 Amendments, these mandates must be met through the endorsement of an "assurance statement" by all schools and postsecondary educational agencies receiving federal funds. Other new provisions in the Perkins Act and the Amendments have called for an in-state allocation formula to spread the funding to all eligible schools and postsecondary institutions, enhancing access to the program by providing information to students and parents about vocational education no later than the ninth grade.

Earlier legislation (i.e., the landmark 1963 Vocational Education Act and the 1968 and 1976 Amendments) largely reflected concerns for enhanced state planning and the appropriate use of funds. Set-asides were established to guarantee that programs serving disadvantaged and disabled students would receive twenty-five to thirty percent of the federal funds received by a state. State boards of vocational education (SBVEs) were urged to collaborate with other state agencies responsible for special education,

rehabilitation, and employment training in developing state plans. Following the enactment of the Education for All Handicapped Children's Act of 1975 (P.L. 94-142), vocational educators were actively encouraged to participate in the development of individualized education plans for handicapped students. Other recent legislation and policy (e.g., P.L. 94-482 and the Office of Civil Rights Guidelines for Eliminating Discrimination and Denial of Services on the Basis of Race, Color, National Origin, Sex, and Handicap [*Vocational Education Programs*, 1979]) established an important trend toward prescribing various forms of local-level responsibility in addressing the needs of special populations.

This paper examines three aspects of equity embedded in the Perkins Act:

1. The extent of access which special needs youth and adults have to programs and services.
2. The effectiveness of various programs and services locally received.
3. The outcomes realized by special students participating in vocational education. (See Plihal, Ernst, & Rehm, 1986, and Harvey & Klein, 1985, for conceptual frameworks for evaluating educational equity.)

The following sections of this paper examine access, program effects, and student outcomes through summaries of recent studies, related evaluative and empirical literature, and data from longitudinal studies. The final section of the paper presents a set of general conclusions and recommendations for improving state policy. These recommendations should be of interest to policymakers at both the federal and state level as they examine alternatives for implementing the 1990 Amendments to the Perkins Act (P.L. 101-392).

This paper gives primary attention to disabled, disadvantaged, and LEP youth served in secondary-level vocational education programs. These groups were chosen because they represent the largest portion of the special needs population currently enrolled. The secondary level was chosen because it has been the focus of most of the comprehensive and empirically grounded studies of vocational special needs programs. Few studies have been done as yet to systematically examine the participation of special needs students in postsecondary vocational education.

Herein, programs in vocational special education are examined with an implicit but often unstated assumption concerning the role of federal policy. Our assumption is that

policy which is optimally effective must be based on an understanding of well-documented, effective practice at the local level. Throughout this paper, the questions to be explored (i.e., questions regarding access, programs, and outcomes) are framed in relation to the net effects that certain policies have upon student's educational achievement, their decisions to stay in school, or their post-school status. To achieve insights from this perspective is extremely difficult, especially because of the myriad of federal, state, and local administrative bureaucracy that has been created. However, most professionals who work in this arena appear to support the view that effective human services must be judged and reshaped accordingly from this perspective.

EXAMINING ACCESS

Who is served in vocational education and the quality of the programs they have access to are critical policy questions at the federal and state levels. This section will describe the enrollment and participation patterns of each of the special population groups. Additionally, the extent to which students are enrolled in mainstream or special, separate programs will be examined; as will the issue of which vocational-technical education programs appear to be responsive to serving special student populations.

As Benson (1988) notes, one of the biggest problems confronting vocational education policymakers is the limited access that special students have to high quality vocational education. The complexity of the problem is easily recognized when one realizes that those communities with the highest unemployment rates, lowest household incomes, and lowest per capita educational expenditures are also the communities that tend to have outdated vocational education facilities, teachers with few incentives to grow professionally, and curriculum and instructional materials that are not linked well with labor market needs and trends. To compound the problem, those communities are also often without large numbers of good semiskilled, skilled, or technical jobs. As noted in the 1981 National Assessment of Vocational Education (NAVE) (David, 1981), the diversity of the vocational education enterprise in this nation is immense, and so is the quality of programs within and across states.

When authorizing the Perkins Act (P.L. 98-524), the Congress clearly declared an intent to strengthen access to vocational education programs. In fact, the second major goal cited for the Perkins Act is to

> Assure that individuals who are inadequately served under vocational education programs are assured equal access to quality vocational education programs, especially individuals who are disadvantaged, who are handicapped, men and women entering nontraditional occupations, adults who are in need of training or retraining, individuals with limited English proficiency, and individuals who are incarcerated in correctional institutions. (Section 2)

The major mechanism Congress established to provide equal access to quality vocational education was a set of earmarked funds within the basic state grant for each of the target groups named above, plus single parents and homemakers. The distribution of these set-asides to the various groups totals fifty-seven percent of the federal funds received annually by each SBVE, leaving the remaining forty-three percent for program improvement and innovative activities.

Additionally, the Perkins Act calls for several forms of inter- and intra-agency coordination. For instance, agencies responsible for programs funded under the Job Training Partnership Act (JTPA) are to review and comment on plans for vocational education at both the state and local level (Section 113 (b)(10)). Appropriate representatives of special education and vocational education are to coordinate planning for handicapped students (Section 204 (a)(3)(B)).

Since the early 1980s, the federal policy goals for providing access to vocational education included (1) focusing on serving a larger array of special target groups, (2) continuing to emphasize appropriate access through provisions such as the least restrictive environment and necessary support services, (3) ensuring consistency and efficiency in program delivery for various federal programs serving the employment preparation needs of special groups, and (4) emphasizing access to vocational education programs of high quality. The latter provision represents an integration of the two major policy thrusts of the Perkins Act, strengthening the capacity for program improvement and improving educational opportunities for special groups. Given the rapid changes occurring in the workplace, the Congress felt strongly that providing access to programs of minimal or average quality would be insufficient for preparing the nation's future workforce,

especially for those individuals who traditionally face special difficulties in securing education and employment.

Enrollment and Participation

Given the federal intent to improve access, enrollment and participation data are important indicators of the degree of access being achieved in any program. Unfortunately, there is only limited data of questionable reliability to report. Presently, states have only minimal responsibility to report information on enrollment through the annual performance report. Since the suspension of the Vocational Education Data System (VEDS) in 1983, the only references for estimating participation are the current longitudinal studies. High School and Beyond (HS&B), the principal longitudinal study launched by the U.S. Department of Education in 1980, tracked a nationally representative sample of approximately twelve thousand sophomores over six years. HS&B data demonstrated the extent to which sophomores from various special groups participated in vocational education at the secondary and postsecondary level. Table 1 presents data on high school vocational education participation by students who were female, in the lowest socioeconomic status (SES) quartile (low income families), came from homes where English is not the primary language, and who identified themselves as being in a special education program during both their sophomore and senior years. It should be noted here that students were asked to self-report any physical or learning disability in the initial HS&B data collection. Thus, the students with disabilities who are represented are only those with mild impairments.

For these groups of students, the following observations can be noted regarding access to vocational education:

- Students from low income (lowest SES quartile) and non-English speaking families tended to complete fewer units of credit—on average about 18.5 units as compared with 19.5 for all sophomores.

- While most sophomores completed 3.75 units of vocational education, low SES students took considerably more—4.5 units. Youth with disabilities and from non-English speaking households completed four and three units respectively.

- Students from low SES families were overrepresented in virtually all indices of vocational education enrollment. They completed more units in both nonoccupationally specific (e.g., general business) and occupationally specific areas (e.g., accounting). In each of the vocational education program areas (e.g., home economics and health), they were more frequently represented than average ability students, students whose families didn't speak English, and students identified as disabled. Among the students concentrating in a specific occupational field (i.e., taking three or more credits), the pattern is most striking. While twenty-one percent of the 1980 sophomores completed a three credit sequence in vocational education, more than 27.5% of the youth from the lowest SES quartile were concentrators.

  Such patterns of tracking may or may not be problematic for these youth, depending upon the quality of employment options open to them, the quality of the vocational education they received, and the value of foregone options. Since many of these students will not do well academically and will not be successful in academic postsecondary programs, a strong vocational education alternative is critically important to their post-school success. However, many vocational programs are poor in quality and are not preparing students in occupations where there is a demand for skilled workers.

- Youth who identified themselves as disabled were participating in vocational education programs to much the same extent that all students were. Their mean scores for all factors, including completion of a concentrated sequence of vocational education courses, tended to be quite close to the means reported for all students. However, the major reservation here is the validity and reliability of the self-reported handicapped data used in HS&B.

- The 1980 sophomores coming from homes where English is not the primary language appear to be severely underrepresented in vocational education programs. While they complete more Carnegie units in high school than other students (19.7 as compared to 19.5), less than three of those units were in a vocational education subject (compared to 3.75). While more than twenty-one percent of the total sophomore sample concentrated in a field of vocational education, only eleven percent of these students chose to do so. At least two major dilemmas

Table 1
Participation in Vocational Education by Special Population Students, High School and Beyond—1980, Sophomore Cohort

Factor	Total	Female	Lowest SES Qrt.	Non-Eng Spkg	In Hdcp Program
Average number of Carnegie units taken in high school	19.49	19.89	18.55	18.44	19.70
Average number of Carnegie units in vocational education	3.79	3.89	4.51	2.99	3.96
% of students participating	92.03	92.37	94.58	90.02	94.80
% of students participating in nonoccupational vocational education	83.75	87.06	87.87	82.24	85.46
% of students participating in any occupationally specific vocational education	73.14	73.00	77.24	64.45	73.82
Average number of Carnegie units earned in occupationally specific courses	1.93	1.92	2.28	1.32	1.89

Source: MPR Associates (1986)

that are raised by this data require further examination and treatment. Either strong cultural biases against vocational education are operating or high schools lack the supportive services and ESL instruction that would enable LEP students to be successful in mainstream vocational classes.

NAVE and the U.S. Office of Special Education and Rehabilitative Services cosponsored a study of the 1987 high school transcripts of approximately thirty-five thousand students from a nationally representative sample of 435 schools, including transcripts of 6,585 disabled students. Handicapped students earned an average of 5.20 credits of vocational education (compared to 4.02 credits for nonhandicapped students for four years of high school), and eighty-one percent of the handicapped students completed their courses in regular, as opposed to self-contained classrooms. These findings clearly confirm that these students, for the most part, have acquired full access to vocational education (Hayward & Wirt, 1989). What remains problematic, however, are some of the major problems that affect all vocational education students—access to programs which offer high quality preparation (e.g., paid work experience and course sequences focused on occupationally specific preparation) and which attempt to overcome the problems of gender stereotyping.

Despite the improved access of special groups to vocational education, there are three major policy areas of concern: (1) the extent to which access to mainstream programs is being attained, (2) the nature and extent of separate programs, and (3) the amount of access to various types and levels of vocational education.

Integration

The extent to which students are served in racially integrated vocational-technical programs is also a key access consideration. Throughout the past three decades, one of Congress's major educational goals has been to improve equality of opportunity. Indeed, since the 1954 Brown v. Board of Education decision, an overriding concern of most federal education legislation has been strengthening the quality of educational opportunities and programs for all students through policies of desegregation and mainstreaming. This view emphasizes the critical role of education in the assimilation of racial and ethnic

minorities, as well as those with disabilities. The school desegregation initiatives of the federal government may be the most significant example of a national policy using educational reform to attain an important societal goal (Braddock, Crain, & McPartland, 1984). Similar statements have been made about the landmark legislation related to education for the handicapped (Gartner & Lipsky, 1987) and the Title I/Chapter I initiative which is focused on serving the educational needs of poor and low achieving children (Wang, Reynolds, & Walberg, 1988).

Here the central question for vocational education is to what extent does current practice and policy inhibit or facilitate the goal of assimilation? Vocational education programs are sometimes able to assimilate disadvantaged students who come from minority groups because regional vocational schools are often racially mixed. This is important because, according to Crain and Strauss (1985), minority students in racially mixed schools develop more optimistic views about their opportunities for postsecondary occupational success. That study and other studies of school desegregation show positive effects for post-school occupational status. Braddock, McPartland, and Trent (1984) found that Blacks and Whites from desegregated elementary and secondary schools were more likely to work in desegregated firms, as were Blacks graduating from predominantly White colleges. In studying the hiring decisions of a national sample of employers, Crain (1984) found that preference was given to Blacks from desegregated suburban high schools.

Of course, vocational education is not always desegregated. In many central cities, there are very few nonminority students to attend regional vocational schools and most vocational education is provided in comprehensive high schools which are often segregated. Finally, it should be noted that the apparent positive effects of desegregation on occupation are derived from studies of comprehensive schools, not vocational schools.

The current literature is devoid of specific studies on critical questions such as the effects of completing vocational programs that are segregated or desegregated on the basis of SES, race, disability, and ability level. To what extent is completing a vocational education program in either of these situations likely to lead graduates to employment in segregated or desegregated workplaces? The matter of whether or not appropriate access is provided must be examined in light of the employment, educational, and social outcomes achieved by being in different types of vocational class settings. Further, the link between

placement in these settings and the quality of the instruction and support services provided therein must be made. In essence, if we examine the outcomes achieved by students in light of both the vocational education setting in which they were prepared (i.e., type of access provided) and the quality of the instruction (i.e., program) they received, the true effects of access policies will be understood.

Least Restrictive Environment

While the least restrictive environment (LRE) provisions clearly infer that many students with disabilities should be enrolled in regular vocational education classes, the LRE provisions do not prescribe mainstream placement for all. Essentially, the provision requires that a continuum of educational settings be available and that parents, special educators, and appropriate assessment personnel jointly determine whether placement in special schools, separate classes, or regular classes with support services is likely to be most appropriate given the student's disability. Further, the alternative schools movement has provided a strong rationale for why some students, in particular pregnant girls and students who are having social adjustment problems, can and should be educated in separate settings for brief or perhaps extended periods of time.

For federal vocational education policy, the key concern is whether or not students with more severe educational problems have access to appropriate vocational instruction in an appropriate setting. Many special state-operated schools (e.g., state schools for the blind or deaf) continue to serve large numbers of students, and may have a vocational education program which is very limited in scope or of poor quality.

Earlier studies have indicated that nearly eighty percent of the students with disabilities are served in mainstream classes with or without support services. While the Office of Special Education and Rehabilitative Services (1990) reports their data in a somewhat different format, the most recent Report to Congress on the Implementation of the Education for All Handicapped Children's Act of 1975 (P.L. 94-142) indicates that approximately sixty-seven percent of all handicapped youth are receiving special education services in either regular classes or resource rooms while being mainstreamed for the majority of the school day (p. 20). As one would anticipate, the appropriate environment

depends greatly on the disability. While only twenty-one percent of learning disabled students are placed in separate classes, nearly fifty-seven percent of the mentally retarded students are in separate classes (p. 23). Generally speaking, vocational education programs seem to be providing instruction in least restrictive settings at a rate comparable to that of regular education programs.

Gender Access

Much of the research on gender stratification leads us to be concerned with access issues. For example, Brinton (1988) claims that differences in the status of men and women are embedded institutional characteristics, so we should focus on the characteristics and climate of the school. Certainly one of the most important organizational aspects is the division of the high school into different vocational curricula and the separation of these from each other and from the academic programs. Creation of separate programs, however educationally useful, reinforce gender differences and undermine the work that schools do to eliminate gender specific socialization. In their report for NAVE, Hayward and Wirt (1989) found that nearly half of the vocational education credits acquired by female students who were identified as handicapped or academically disadvantaged were taken in service occupation courses, home economics, or consumer education. The situation for special population students is similar to the mainstream population where male students have greater occupational opportunities.

Program Access

If one examines access across specific vocational education programs, a number of issues are raised. Among the most frequently asked questions are which vocational education programs attract special population students and what are the implications for labor market success. Viewed on a larger scale, the issue can be framed in terms of whether the purpose of vocational education is to prepare students for immediate entry to the labor force or whether vocational education has some general education purpose and value for all students at the high school level, including those intending to pursue postsecondary or higher education. Since students with special needs are often regarded as

having marginal educational potential, whether or not vocational education programs extend or reduce the effects of ability tracking and occupational stereotyping is a particularly volatile issue.

If one adopts the currently popular, egalitarian view that high schools and vocational education programs should be providing opportunities for all students to acquire competence in reasoning, critical thinking, computing, effective interpersonal communication, and teamwork (Carnevale, Gainer, & Meltzer, 1988; Johnson, Foster, & Satchwell, 1989), then access to the more sophisticated knowledge found in programs such as electronics, office administration, and horticulture is imperative. For special students, however, the assumption required in this hypothesis is that sufficient instructional expertise and resources exist to enable students to acquire this knowledge and competence.

Alternatively, the dominant view historically has been one which indicates the major role for vocational education is to assist students in discovering their occupational niche early in their high school careers and to provide time and resources for them to acquire the competence to enter the workforce directly from high school (Berryman, 1980). From this perspective, special needs students are often viewed as more inclined toward and capable of filling the less demanding occupational niches.

In general, special needs students at the secondary level have access to the full range of program areas within vocational education (as noted in Table 2). Based on data from the 1980 sophomore cohort of HS&B, Table 2 shows that self-identified handicapped students were slightly overrepresented in occupationally specific courses in agriculture, occupational home economics, and trade and industry education. They were significantly underrepresented in business, and minimally underrepresented in marketing, health occupations, and technical education. The pattern is similar for the economically disadvantaged. In 1980-1981, VEDS reported disadvantaged students represented 15.2% of the total vocational education enrollment across all fields. However, in occupational home economics programs, they constituted 22.2% of the enrollees. Conversely, disadvantaged learners were underrepresented in industrial arts programs (9.0%), marketing (11.3%), and health occupations (11.3%). However, in 1980, when the participation of low SES students in the occupationally specific courses above was examined, these students tended to be slightly overrepresented in all areas except technical education.

LEP students appear to have markedly different patterns of participation than other special population students. In the HS&B sophomore cohort, those students from non-English speaking households were significantly underrepresented in occupationally specific courses. While 73.1% of the students had taken occupationally specific courses, only 64.4% of the non-English speakers had done so. Occupational home economics was the only area in which they enrolled more frequently than the total school population.

Overall, it appears that the LRE provision and other mainstreaming initiatives are clearly reflected in the enrollment of disadvantaged, disabled, and LEP students in vocational education. Generally speaking, disadvantaged and low SES students participate more heavily in vocational education classes (Campbell, Basinger, Dauner, & Parks, 1986; Lotto, 1988) than do non-special needs students. Earlier, Table 1 noted that youth from the lower SES quartile are more likely to be enrolled in occupationally specific courses and programs: seventy-seven percent compared to the seventy-three percent for the general population. In addition, that table showed that twenty-eight percent of the students in the lower quartile were "concentrators"--taking three or more courses in an occupational sequence—compared to only twenty-two percent among the general population. These differences of between four and six percent mean that vocational education is serving hundreds of thousands of more disadvantaged students than would be the case if vocational education enrollment was simply typical of comprehensive high schools. The differentiated equity question must be raised here. To what extent should federal and state policy be concerned with the overrepresentation in selected areas of vocational education for certain special population students, especially low income and minority students?

The participation of disabled students in occupationally specific vocational education appears to be improving steadily from earlier studies. Nearly seventy-one percent of those identified as handicapped were taking some form of occupationally specific vocational education, compared with 73.1% of all students. However, further research appears to be needed to address the question of why disabled students are underrepresented in specific areas such as business, technical, and marketing education.

The large discrepancy in vocational education participation by LEP students also merits intensive study. These students and their families have clearly demonstrated reservations regarding vocational education programs. Only sixty-four percent of students

Table 2

Percentage of Students Taking Occupationally Specific Courses, by Program and Selected Student Characteristics

	Total	Female	Lowest SES Qrt	Non-Eng Speaking	In Hdcp Progr m
Any Occupationally Specific Program	73.1	73.0	77.2	64.6	73.8
Agriculture	9.3	5.5	10.8	4.3	11.28
Business	44.9	58.2	47.4	40.0	41.5
Marketing and Distribution	7.9	8.2	8.8	6.0	9.8
Health Occupations	2.3	3.4	3.3	2.1	3.6
Occupational Home Economics	8.3	13.1	10.0	11.0	8.5
Trade and Industry	26.3	10.2	28.6	24.3	29.8
Technical	8.9	8.1	5.8	4.2	6.3

from non-English speaking families choose to enroll in occupationally specific vocational education, compared to seventy-three percent of the total population of high school students. Further research is needed which will identify and assess the cultural, attitudinal, or related factors influencing this phenomenon.

Expanding Diversity

Undoubtedly, the most crucial question to be faced by the educational community in the coming decade is how to provide effective education for the rapidly growing population of students with special needs. The demographic studies describing our nation's school and preschool populations paint a markedly different picture from the students traditionally served by educators at all levels. Some of the major findings and implications cited frequently include the following:

- Twelve out of every one hundred children born today are born out of wedlock, half of those to teenage mothers. Babies of teenage mothers are often born prematurely and often develop health and learning problems (Wang, Reynolds, & Walberg, 1988).

- Between 1969 and 1984, the percentage of children in families living below the poverty standard increased from 13.8% to 21% (U.S. Bureau of the Census, 1986). The 1981 Survey of Children revealed that of children from families with annual incomes of less than $10,000, 35% required remedial reading and 16.7% were slow learners or learning disabled.

- The educationally disadvantaged population is growing at a far more rapid rate than the rest of the population. Although not all minorities are disadvantaged, and many disadvantaged students are not members of ethnic or racial groups, the minority population can be used as a proxy for assessing the size of the disadvantaged population in the U.S. schools (Levin, 1985). From 1970 to 1980, while public school enrollments dropped from forty-six to forty-one million, minority enrollments rose from twenty-one to twenty-seven percent of the total (about eleven million)(National Center for Educational Statistics, 1984). Higher birth rates

among minorities and unprecedented immigration have created a major challenge for U.S. schools.

- Levin (1985) notes further that there is wide variation among states with respect to size of their minority populations as well as the rate of growth of the populations. Some states have large populations (New York, Florida, and South Carolina) with relatively low growth rates, while other states (Massachusetts, Connecticut, and Oregon) have small proportions of the minorities, but rapid growth rates. Census data reveals that documented immigrants reside in a relatively small number of states: twenty-eight percent in California, sixteen percent in New York, nine percent in Texas, eight percent in Florida, six percent in Illinois, four percent in New Jersey, and three percent in Massachusetts (Kellogg, 1988). Urban settings, with minority school populations ranging from seventy to ninety percent, appear to be particularly problematic (McNett, 1983).

While the number of at-risk children entering the educational system is clearly growing at a rapid pace, the magnitude of their educational and economic problems is also increasing. Levin (1985) attributes much of the growth of severely impoverished students to the new immigrant populations who are arriving from the poorest countries in Asia and Latin America. Youth whose parents lack, in many cases, even a primary education face great difficulty in obtaining the help of their parents in dealing successfully with school.

Regarding students identified as severely mentally handicapped, considerable efforts are underway to integrate even those students into schools. Describing the work of the California Research Institute on the Integration of Students with Severe Disabilities, Gartner and Lipsky (1987) note that in the San Francisco Bay Area Schools, severely mentally handicapped students are being placed in schools and selected classrooms with chronologically age-appropriate peers. These students are being placed in all the nonacademic activities of the school and have regular and sustained opportunities for interaction with their nondisabled peers. In terms of instruction, they are provided with a functional skills curriculum, which is aimed at integrating academic, vocational, and life skills.

The ramifications of these trends for the schools and vocational education are clearly spelled out in Hodgkinson's (1985) publication describing the future of schools.

Hodgkinson describes the class of 2001, which started kindergarten in the Fall of 1987, as presenting major challenges for the schools, given its high proportion of at-risk students. For example,

- Minority enrollments in Kindergarten now range from seventy to ninety-six percent in the nation's fifteen largest school systems;
- Twenty-five percent of these children currently live below the poverty level, the highest proportion in more than twenty years;
- Fifteen percent are identified as physically or mentally handicapped;
- Fourteen percent are children of teenage mothers;
- Fourteen percent are children of unmarried parents;
- Ten percent have poorly educated or illiterate parents;
- Between one-quarter and one-third of the children have no adult at home when they return from school;
- Forty percent will have lived with one parent for some period of time before reaching the age of eighteen; and
- Twenty-five percent (or more) will not finish high school.

Further, the 1987 Report to Congress on the Implementation of P.L. 94-142 notes that 211,000 handicapped youth between the ages of sixteen and twenty-one exited from school during 1984-1985. Of these, only thirty-nine percent graduated with a diploma. Another fifteen percent exited with a certificate of completion. The remainder, nearly half, simply left school, and a significant portion, estimated at more than twenty-five percent, will never complete high school. As usual, large differences were noted across various handicapping conditions. The dropout rate for students identified as emotionally disturbed exceeded twenty-nine percent. When state special education departments were asked to identify the specific programs and services needed to improve their dropout prevention problem, forty-two states identified vocational education as essential to their retention efforts.

To compound matters, the changing demographics of the workforce make it imperative that vocational education programs be maximally responsive in serving special needs populations. In the document entitled *Workforce 2000*, the U.S. Department of Labor (n.d.) offers the following projections:

- Both the workforce and the population will grow very slowly over the next fifteen years.

- The pool of young workers entering the labor market will shrink, but the proportion of the youth labor force that is minority will increase substantially.

- Immigrants will represent the largest share of the increase in the population and workforce since World War I. Four to six million immigrants will enter the workforce in the next fifteen years.

- By the year 2000, approximately forty-seven percent of the workforce will be women, with sixty percent of working age women at work.

- Most labor force growth will come from groups in the population that have traditionally been underutilized (e.g., the poor, minorities, and the disabled), and who suffer from employment problems.

- There will be significant geographic and occupational shifts in employment during this period. Jobs will continue to shift from goods-producing industries to the service sector (ninety percent of all new jobs will be in services). Managerial and professional jobs are expected to grow by 5.2 million, while operative and laborer slots will increase by only 1.3 million.

- Responding to technological change and employers' needs for meeting international competition will require many workers to have higher levels of analytic and reasoning skills.

These population demographic data and workplace trends will provide complex challenges for the delivery of quality vocational-technical education. As the workplace becomes more knowledge-intensive, a growing percentage of jobs will require expertise in problem-solving, critical thinking, computing, teamwork, and other non-technical skills (Commission on the Skills of the American Workforce, 1990; Johnson et al., 1989). Clearly, the current crisis in American education centers on the acknowledgement that many graduates are leaving high school without the skills needed to compete in a global, technically oriented economy. When coupling the rising technical and learning demands of

the workplace with the rapid growth in children from "at-risk" environments where education is undervalued, the prospects for resolving the "crisis" in American education are quite bleak unless new policies and resource commitments are developed.

The following section examines local program practices and policies generally acknowledged to provide effective vocational education for special population students. The identification of effective practices provides a means for validating or questioning federal and state policies.

EXAMINING PROGRAM EFFECTIVENESS

The Perkins Act of 1984 and the 1990 Amendments prescribe certain components for all vocational education programs serving special needs students. Those components include early notification of students and parents regarding available vocational education programs; full access to all vocational education programs, offering programs in the least restrictive environment; and collaboration between special educators and vocational educators as part of the individualized education planning (IEP) process. Although the federal legislation which authorizes special education and vocational education does not explicitly mandate the merger of these two major components of the nation's secondary educational system, it is clear that federal policy is increasingly sensitive to the vocational education needs of special needs students at all levels.

Relatively few studies have been conducted in recent years which describe the effectiveness of various program models or approaches. In developing a more complete knowledge base of effective programs and practices, it is important to consider the relationship of vocational education experiences and programs to post-school outcomes. Hasazi, Gordon, and Roe (1985), in a follow-up study of special education students who exited the secondary educational setting in Vermont, report that, "For those (disabled) students who completed vocational education, 61% were currently employed, compared with only 45% of those who had no vocational education" (p. 460). The authors go on to report that vocational education "appears to be related to employment status and that youth who have participated in high school vocational education programs were more likely to be employed than those who did not" (p. 466). Hasazi and her colleagues also contend that

"other" aspects of the vocational education program such as the mainstream environment of most programs in Vermont and the interaction with nonhandicapped peers may have influenced students' employment status.

Overall, few studies have been conducted which examine the relationship between participation in vocational education programs and post-school outcomes. Only a handful of studies can be found which examine the impact of various vocational education approaches and curricula. The efficacy of special programs and support services in area vocational centers, comprehensive high schools, and community colleges has not been examined carefully enough to determine what works for different types of students. While special needs students are present in the vast majority of programs, we know relatively little about what actually goes on in most programs.

This section summarizes findings from the small number of recent studies of effective or exemplary programs serving special needs students in order to provide some preliminary answers to the question, "What works?" Important related questions to consider include "To what extent are the special services mandated by the Perkins Act found as central elements of effective or exemplary programs?"; "In secondary vocational education programs that are changing, what are the primary and secondary goals for special needs students?"; "To what extent does interagency and interdisciplinary collaboration undergird effective programs?"; and "How much do maximally effective vocational education programs for special needs students cost?"

Five studies of exemplary vocational education programs serving special needs youth and adults were identified for further investigation. Most of these studies were initiated using a nomination strategy for identifying exemplary programs. Nominations of *outstanding, effective,* or *exemplary* programs were generally sought from State Directors of Special Education, State Consultants/Administrators of Vocational Education Special Needs Programs, vocational educators, and special educators involved in the vocational preparation of secondary-level special needs learners. Some of the studies looked only at certain types of vocational education programs (i.e., occupationally specific) and certain populations (i.e., mildly handicapped). However, the five studies taken in the aggregate provide a comprehensive examination of the field (see the appendix for a summary of the studies). The specific characteristics of the effective program studies are summarized in Table 3. Based on a content analysis of the major publications resulting from the five

Table 3
Characteristics of Effective Program Studies

	Eagle et al., 1987	Hoachlander et al., 1987	Parks et al., 1987	Friedenberg et al., 1988	Gugerty et al., 1988
Effective Programs Identified through					
Nominating Strategy	x	x	x		x
Analysis of Outcome Data	x	x	x		x
Other			x	x	
Students Served					
Handicapped	x	x	x		x
Disadvantaged		x	x		x
Limited-English Proficient		x	x	x	
Other			x		
Educational Setting					
Junior High/Middle School			x	x	
Comprehensive High School	x		x	x	x
Area Vocational Center	x		x	x	x
Postsecondary Institution		x		x	
Community College		x		x	
Community-Based Organization		x			
Other		x			
Program Setting					
Mainstream	x	x	x	x	x
Pull-Out	x		x		x
Segregated	x	x	x		
Other	x				
Vocational Orientation					
Exploration Programs	x		x	x	x
Occupationally Specific	x	x	x	x	x
Work Experience Programs	x	x	x	x	x

studies, Table 4 lists the various common components identified by each study. The program components presented in Table 4 appeared in at least two of the exemplary program studies. Since each of the studies had a unique focus, the list which is presented here must be interpreted with caution. Individualized instruction, for instance, was characterized in different ways in the studies.

The components listed in Table 4 demonstrate how certain secondary vocational education programs have effectively put into practice the mandates of the Perkins Act. Assessment, supportive services, and the other mandated services were present in most of the programs described as exemplary. However, in the absence of carefully designed studies relating student outcomes to the presence or absence of specific components, it is not possible to say which of these components enhance the likelihood of certain outcomes. One could conclude (with some cynicism) that these programs were nominated as "exemplary" simply because they were providing all of the services mandated by the Perkins Act.

Further, the reader is cautioned against the assumption that these components are equally generalizable. Parks, McKinney, and Mahlman (1987) warn that

> Caution should be exercised in interpreting the characteristics of effective programs. The identification of effective programs does not automatically translate into goals for all programs desiring to be exemplary. Effective characteristics are context specific; what works in one site may or may not work in another site for multiple reasons. (p. 73)

Despite these limitations, the list of program attributes in Table 4 provides a beginning point from which to identify and further study those components which current practice and conventional professional wisdom deem important. The section below discusses each of the fifteen attributes found in two or more of the studies.

Components of Effective Programs

Administrative Support

Support from district administrators, building-level principals, and/or the head of the vocational education program was cited as a characteristic of effective vocational education programs for special needs learners in studies by Eagle, Choy, Hoachlander,

Stoddard, and Tuma (1987), Friedenberg, Gordon, and Dillman (1988), and Gugerty, Tindall, Heffron, and Dougherty (1988). Eagle et al. (1987) reported that successful vocational education programs for special needs students require strong administrative support. In their study of twelve nationally recognized vocational education programs for special needs learners, Gugerty et al. noted that in the programs reviewed, administrators, the school board, and the community support the overall effort.

Sufficient Financial Support

Sufficient financial support is a characteristic of successful programs identified by Gugerty et al. (1988) and Parks et al. (1987). Parks et al. found two aspects of fiscal support among the effective programs they studied:

> 1. Multiple sources of funds were coordinated to maximize their effective and efficient use.
> 2. Adequate funds were available to maintain up-to-date equipment and materials. (p. xi)

Up-to-date and attractive equipment is an important factor in dealing with special students because they are often more distrustful of their own future than other students. Any suggestion that they are using inadequate materials will often discourage them and leave them with strong feelings of hopelessness, while more advantaged students in the same situation may have enough confidence in their future not to be as disturbed by the presence of out-of-date or inadequate appearing equipment. This hypothesis has not been tested directly, but is derived from a well-developed theory by Stinchecombe (1957).

The financing of successful vocational education programs for special needs students requires careful study at all levels: federal, state, and local. Eagle et al. (1987) described the financial differences incurred by some of the effective programs identified through her research, and it is clear that effective programs for special needs students are expensive. A study of eight vocational special needs programs in Illinois found the average annual cost per student to be approximately $4,000 for programs ranging from six months to two years in duration (Phelps, Blanchard, Larkin, & Cobb, 1982). Additional studies are needed to carefully examine the cost-benefit considerations involved with providing vocational programs for special needs youth and adults. The higher costs of these programs may clearly be justified if they result in reduced dependency on unemployment insurance and other social welfare programs.

Table 4

Components of Effective Vocational Education Programs

	Eagle et al., 1987	Hoachlander et al., 1987	Parks et al., 1987	Friedenberg et al., 1988	Gugerty et al., 1988	Eff. Ins. Studies*
Administrative Support	x			x	x	
Financial Support			x		x	
Early Notification		x		x	x	
Assessment of Interests and Abilities	x	x	x	x	x	
Involvement in IEP			x		x	
Heterogeneous Classes	x					x
Integration of Academic and Vocational Curricula						x
Individualized Instruction	x	x	x	x	x	
Cooperative Learning						x
Work Experience	x	x		x	x	
Support Services	x	x	x	x	x	
Career Counseling and Guidance		x		x		
Collaboration	x	x	x	x	x	
Transition Planning	x				x	
Follow-up of Graduates	x	x	x			

* Signifies support found in recent studies of effective instruction for disadvantaged, disabled, and LEP students.

Early Notification

Under the mandates of the Perkins Act and the assurances provision of the 1990 Amendments, local education agencies (LEAs) are required to notify all special needs students about the vocational education options available to them at least one year prior to the time when the student would be eligible to enroll in these programs. Early notification is considered a characteristic of effective programs for special needs students in the reports conducted by Friedenberg et al. (1988) and Gugerty et al. (1988). Generally, early notification activities provide students and parents with information about entrance requirements for the programs and the vocational options available to them.

Assessment of Interests and Abilities

The Perkins Act mandates assessment procedures for special needs students enrolled in secondary vocational education programs. Section 204c states that special needs students enrolled in vocational education programs must be provided "an assessment of the interests, abilities, and special needs . . . with respect to successful completion of the vocational education program." Provisions for assessment of both interests and abilities were noted in the effective vocational education programs studied by Eagle et al. (1987), Friedenberg et al. (1988), Gugerty et al. (1988), and Parks et al. (1987).

In the Eagle, Gugerty, and Parks studies, vocational assessment processes were found to be multifaceted. In these programs, vocational assessment was an ongoing process, designed to assess both the student's vocational development and viable career-related options. Effective assessment practices involved detailed profiles of the student's vocational interests and aptitudes. Effective assessment was usually conducted by a professional other than a vocational education teacher who was knowledgeable about assessment procedures and career planning. However, in some cases, the vocational assessment activities were carried out by vocational and special education teachers in their classrooms.

Involvement in the IEP Process

Each of the effective vocational education programs serving students with disabilities had some mechanism in place to involve the appropriate vocational educators in the IEP planning and development process. Vocational educators' involvement in the IEP process is a characteristic of the effective programs reviewed by Gugerty et al. (1988) and

Parks et al. (1987). In order for vocational education to be more relevant to special needs students, the Perkins Act and much of the current literature argues that vocational educators should actively participate in appropriate IEP meetings. Various approaches to IEP planning have been developed involving parents, employers, and agency personnel (e.g., vocational rehabilitation counselors). Further, the recently enacted Individuals with Disabilities Education Act (P.L. 101-476) requires that school-to-work transition plans be developed as part of the IEP for high school age disabled youth.

Heterogeneous Classes

The recent literature on effective instruction clearly establishes that several groups of special needs students learn basic skills more quickly in heterogeneous classes. Students with disabilities benefit from mainstreaming (Slavin, 1983), and minority students benefit from racial desegregation (Crain & Mahard, 1983). While the Eagle et al. (1987) study was the only study explicitly mentioning the need for heterogeneous classes, several of the other studies noted the importance of interaction with non-special needs students through vocational student organizations, job clubs, and other extracurricular activities.

Integrating Vocational and Academic Curricula

The rapidly changing workplace has created increased demands for preparing students for postsecondary vocational-technical education. In preparation for further technical education, many secondary-level programs have increased the attention given to basic and academic skills through vocational curriculum and instruction. The 1990 Amendments include a separate authorization for Tech-Prep programs which are aimed specifically at preparing students for technical careers requiring an associate degree. Unfortunately, most of the current enthusiasm for Tech-Prep programs does not address the issues of assuring support services for special needs students as an integral aspect of the initiative. However, it is imperative to assure that special needs students will be served in these "upskilled" vocational-technical programs. To assume otherwise would contradict the access and equity provisions of several federal statutes. More specifically, such an assumption would do little to enhance the increased quality of life prospects for the one-third of our youth who are "at risk" of failing educationally, socially, and economically.

There are five key issues here. First, much of American secondary education is predicated on the assumption and cultural expectation that no student should be prematurely

foreclosed from a college education. This issue is especially important for some students in special needs groups because the absence of early education at home may have prevented them from having aspirations to attend college at the time they began vocational education. Finding success in vocational programs which are rich in academic learning can enhance a student's aspirations and self-confidence relative to pursuing postsecondary education.

Second, there will be many students from special needs groups who might realize that they would benefit from vocational education, but will be reluctant to abandon hopes of college graduation. Students with special needs who plan to pursue postsecondary education need to understand the occupational relevance of scientific, mathematical, and communication concepts to appreciate fully the ways in which this knowledge is used beyond the classroom.

Third, some special needs students have difficulty dealing realistically and optimistically with their futures. This is especially true of minorities who come from poor families and whose experience is limited to segregated schooling (Wilson, 1979). This may be true of other special needs students whose poor school performance history may make it difficult for them to plan optimistically for their future. Vocational programs may find it much easier to recruit these students if the vocational programs and courses provide opportunities to attend a four-year college.

Fourth, academic learning in a vocational setting may be especially effective because authors such as Ernest Boyer (1983) have stressed the value of experiential learning in developing fundamental categories upon which to build more sophisticated concepts. Experiential learning may also provide the motivation that can partially offset a history of poor academic performance. Effective vocational education instructors coordinate the academic methodology with that given by the teachers of academic subjects so as to maximize the degree to which transference from the experiential learning setting to the traditional academic classroom will take place (Crowe & Adams, 1979). Experiential learning is also closely related to the case method of teaching used in business and law schools. Vocational education can draw upon these methods also, enabling students to apply knowledge to real world settings and recognize the relevance of theoretical knowledge for their work and family futures.

A ten-site demonstration project in California known as the Peninsula Academies has been found to be an effective model for curriculum integration in several studies (Stern, Dayton, Il-Woo, Weisberg, & Evans, 1988). The academy programs use a career theme (e.g., computer science, health careers) and directly correlate math, science, and English instruction with the career theme for cohorts of at-risk students. The program employs a "school within a school" model and uses mentors from business and industry to work with individual students beginning in the tenth grade. Independent evaluation studies on the academies report that participants generally have better grades and earn more credits than at-risk students who did not participate.

Fifth, Osterman (1980) argues that many firms reserve their entry-level positions for persons over the age of twenty-one, thus pushing new high school graduates into a marginal labor market. This circumstance clearly suggests that secondary school programs for special needs students should make sure that students develop the academic backgrounds necessary to enable them to pursue postsecondary vocational education during what might otherwise be wasted years.

While the integration of vocational and academic curriculum and instruction has received considerable attention in the past two years, little explicit attention has been given to how the various approaches might serve students with special needs. Clearly, the general assumption in much of the descriptive work (Grubb, Davis, Lum, Plihal, & Morgaine, 1990; Adelman, 1989) has been that this integration will serve all students equally well. The validity of this assumption needs to be examined in future research.

Individualized Instruction

Each of the five studies of effective programs found that some form of individualized instruction was a key component of successful programs. Eagle et al. (1987) identified six vocational education practices that encompass the individualized instruction component of effective programs:

1. The instructional sequences offer different learning environments from the most to the least restrictive, as well as ways for students to move from one to the other.
2. Small vocational classes and each mainstream class serve only a few (no more than five) disabled students.

3. Vocational classroom teachers have well-qualified assistance from aides and/or tutors on a regular basis.
4. Learning goals include a focus on acquiring employability, in addition to academic, social, and occupational skills.
5. Teachers match instructional materials to student abilities.
6. Teachers provide extra attention to disabled students without stigmatizing them through differential treatment.

Cooperative Learning

Several studies have found that employers stress employment skills which are more general than those learned in occupationally specific classes (Johnson et al., 1989). For example, the vast majority of workers must be able to work effectively in teams, adding new light to the value of cooperative learning.

Cooperative learning is a technique originally developed for elementary school students in order to improve the academic performance and social relations of all students (Slavin, 1983). The method calls for the organization of heterogeneous teams which compete with each other to complete assignments. Each team member is responsible for their own performance, but the demands made on each individual vary according to their ability. Thus, the performance of the weaker student is just as important to the team as that of the more able team members. Weak students are motivated and rewarded for their teamwork contributions. The cooperative learning method is particularly valuable when students in the class vary considerably in ability, when the class includes mainstream special education students, or when the class is ethnically heterogeneous (Crain, Mahard, & Narot, 1982). This method has been shown to be particularly effective with mainstream special needs students (Slavin, Madden, & Leavey, 1984).

Work Experience

In the literature describing the post-school performance of students with disabilities, work experience which was either school-sponsored or independently obtained appears to be related to post-school employment status (Hasazi et al., 1985; Mithaug, Horiuchi, & Fanning, 1985). However, Hasazi et al. note that work experience associated with special education did not significantly increase the employment status of handicapped youth, partly

due to the fact that special education work experience programs focused on "exploration" rather than "real, paid employment" (p. 467).

As noted in Table 4, work experience opportunities were found in most effective programs for special needs students (Eagle et al., 1987; Friedenberg et al., 1988; Gugerty et al., 1988; Hoachlander & Stoddard, 1987; Parks et al., 1987). However, none of the studies examined how the work experience programs affect education and employment outcomes realized by students after leaving secondary school.

Support Services

Several of the studies suggest that learner-appropriate and intensive support services need to be provided both to special needs students enrolled in vocational education programs and vocational educators who are instructing those students. Gugerty et al. (1988) has identified two elements relating to quality support services for special needs students enrolled in vocational education:

1. Specific staff assignments, not added duties, to provide services necessary to help special needs students receive appropriate vocational education, and
2. Staff assignments to provide support both within and outside the mainstream vocational education setting.

Similar findings by Eagle et al. (1987) noted that effective programs provided a high level of support services from learning specialists to vocational educators and special needs students. Support services, including resource room and mainstream setting support, are also identified in studies by Friedenberg et al. (1988) and Parks et al. (1987).

Effective support services require a reciprocal communication process between vocational and special educators. The provision of support services does not infer that only the special educator should concentrate on specific vocational goals and objectives specified during the IEP process. Vocational educators should be supporting the work of special educators to develop and reinforce the acquisition of academic, social, and behavioral competencies.

Career Counseling and Guidance

Section 118c of the 1990 Amendments assures that special needs students receive "Guidance, counseling, and career development activities conducted by certified vocational counselors trained to work with special needs students." Most of the effective programs studied included a guidance and counseling component (Eagle et al., 1987; Friedenberg et al., 1988; Gugerty et al., 1988; Hoachlander et al., 1987; Parks et al., 1987).

In the programs studied, counseling and guidance activities were provided through an ongoing process to special needs students enrolled in vocational education programs (Gugerty et al., 1988). Effective vocational education programs for special needs students integrated guidance and counseling services into the normal delivery of services.

In several of the studies, specialized counseling was cited as especially important in enabling women students to enter nontraditional careers. Effective programs for dealing with gender issues require considerable counseling support from female counselors who are sensitive to the issues, and female, minority, and disabled role models on the faculty of the vocational education program. When career information and counseling are inadequate, special needs students are reluctant to consider occupations which have traditionally employed few minorities.

Collaboration

Undergirding effective vocational education programs for special needs students is the need for intradisciplinary and interagency collaboration (Eagle et al., 1987; Friedenberg et al., 1988; Gugerty et al., 1988; Hoachlander et al., 1987; Parks et al., 1987). Collaboration within the school includes coordination among the vocational educators, special educators, administrators, parents, guidance counselors, school board members, and the students themselves. At the interagency level, collaborative and cooperative agreements should exist between the secondary schools and postsecondary educational institutions, Job Training agency (JTPA) professionals, vocational rehabilitation agencies, job placement and training organizations, and other community-based organizations that assist in the career or vocational development of special needs students.

As a result of federal and state legislation, many other community-based agencies are in place to assist special needs students and graduates. Effective vocational education

programs in various communities have discovered unique ways of integrating the resources available through programs such as the JTPA to strengthen and expand vocational programs and support services for disadvantaged youth (Grubb, Brown, Kaufman, & Lederer, 1989).

Transition Planning

Transition planning, designed to bridge the gap between the secondary school and employment and/or postsecondary education (Will, 1984) for special needs students was an explicit component of the programs studied by Eagle et al. (1987) and Gugerty et al. (1988). Eagle et al. found that transition services included job placement and follow-up of students. As with the IEP process described above, transition planning is currently and primarily associated with students with disabilities. However, the Perkins Act (Section 204c) and the 1990 Amendments (Section 118c) mandated the provision of transition planning for disadvantaged and handicapped students by requiring "Counseling and transitional services designed to facilitate the transition from school to post-school employment and career opportunities." However, the exemplary program studies failed to reveal how LEAs were providing these transitional services.

Further, research on disadvantaged adolescents strongly suggests that they would benefit from formal transition planning. These students do not usually have good knowledge of the labor market, or personal contacts that can be used during a job search. Special needs students come disproportionately from low income families where there are fewer relatives and friends in quality jobs. Many special needs students come from minority groups where families have historically been cut off from many occupations and where ethnic discrimination still plays a role in employment. The problem is exacerbated because many special needs students have low self-esteem and a lower sense of control of their environment. Thus, special needs students have less access to the labor market, are more likely to suffer from discrimination, and are more likely to give up early in the job search process.

Follow-Up of Graduates

Most studies of effective programs for special needs students found that follow-up of graduates was an essential ingredient (Eagle et al., 1987; Friedenberg et al., 1988; Gugerty et al., 1988; Hoachlander et al., 1987; Parks et al., 1987). Across the programs

studied, it was noted that formal, systematic follow-up studies were routinely conducted by program staff. Formal follow-up systems were found to assist administrators in developing provisions related to future support services and new programs. The fact that effective vocational programs and schools have careful follow-up services to monitor their effectiveness is analogous to the effective high schools that use large amounts of testing and analysis of test results to monitor performance in relation to student learning outcomes.

Conclusions

This analysis of the current literature on effective secondary school instruction and studies of exemplary vocational education programs for special population students has provided a list of fifteen components of effective programs. While this list is a helpful beginning for suggesting practices that are in common use, there appears to be only limited empirical evidence for the list. It is somewhat reassuring to see that many of the programs included in the exemplary program studies do include the mandated services for handicapped and disadvantaged students that were prescribed in the 1984 Perkins Act and 1990 Amendments. This provides at least tacit validation for many of the provisions of the Perkins Act. However, it is crucial that the vocational education community delineate the outcomes they envision for special needs populations, and determine which program components are essential for providing these short- and long-term outcomes.

EXAMINING STUDENT OUTCOMES

Traditionally, post-program employment status has been the principal measure of success for vocational education programs. The perception of the general public and many policymakers is that vocational education prepares students for direct entry to the labor force and that the most appropriate measures of its success include the employment rates and earnings of graduates. Among the questions most frequently asked about vocational education are "In what kinds of occupations do vocational education graduates work?" and "Do graduates have higher earnings than nonvocational education graduates?" (National Center for Research in Vocational Education, 1987). However, close scrutiny of

vocational education at both the secondary and postsecondary level reveals that most programs are designed to support multiple goals and outcomes for the students they serve. Among the numerous and diverse goals reflected in the literature are providing options for non-college bound youth; reducing the school dropout rate; providing reinforcement and enhancement of basic academic knowledge and skills; providing career exploration and planning experiences; assuring that students acquire general employability skills (e.g., job-seeking skills); and teaching specific concepts such as entrepreneurship, problem solving, and leadership. Clearly, the most critical dilemma for vocational education, particularly at the secondary level, is achieving consensus among professionals, policymakers, employers, and the general public regarding the purpose(s) of vocational education and the associated learning outcomes (Phelps, 1989).

Pratzner and Russell (1983) caution against making generalizations about vocational education outcomes at the secondary and postsecondary levels. Following a comprehensive review of the literature, they identified the following optimal roles for secondary and postsecondary vocational education:

Secondary Vocational Education	Postsecondary Vocational Education
Driven by individual needs Goal is primarily educational Program is exploratory	Driven by labor market needs Goal is primarily training Program is specialized job skill development
To address the goal, the program must • be suited to individual needs • offer the widest possible range of occupational experiences	To meet its goal, the program must provide specialized technical skills related to actual and anticipated employment opportunities
Outcome measures focus on extent to which students pursue a wide range of employment and educational options	Outcome measures focus on high placement rates in occupations related to the training

As noted earlier, the educational reform movement has stimulated considerable debate about vocational education and the contributions it makes to broader educational outcomes, especially in the high school. Given that federal funding constitutes only a relatively small portion of the total expenditures for vocational education (in most states less than ten percent), it is appropriate to suggest that federal and state policy for vocational

education should focus on a subset of these diverse and important functions of vocational education. For secondary programs, the goals of the Perkins Act focus clearly on the outcomes of reducing youth unemployment, improving access and equity for special populations, and enhancing the attainment of basic skills by vocational education students.

Relative to vocational education outcomes for special populations, several major dilemmas exist. First, most of the literature focusing on goals and outcomes has not been designed to identify or differentiate outcomes that are particularly appropriate for individuals with special educational or employment needs. The merits of such an approach can be debated on the grounds of whether or not it perpetuates stereotypes and tracking. However, focusing program evaluation and student outcome assessment only on special populations can be viewed as essential for maximizing the impact of vocational education on students who are likely to drop out, who have lower achievement, and who less frequently pursue postsecondary education. The 1990 Amendments to the Perkins Act have taken this approach by requiring each local recipient to annually review those programs serving special populations (see Section 117(a)(1)).

Throughout the early 1980s, the vast majority of educational reform reports clearly and intentionally overlooked the matter of equity and special populations (Phelps, 1985; Lilly, 1987). What special needs students are to acquire from reform in the secondary schools, and vocational education programs in particular, is largely uninvestigated by the research community, and clearly overlooked in the initial phase of the educational reform movement. The Council of Chief State School Officers (1987) and other national organizations have undertaken initiatives to address the matter of at-risk students as the second (or third) wave of educational reform. More recently, the President and Governors' summit conference on education produced a set of national goals for education which include reducing the dropout rate and providing students (youth and adults) with the knowledge and skills necessary to compete in a global economy (U.S. Department of Education, 1990).

Several critical issues are at the center of debates about vocational education for special populations. Among the major questions are whether or not vocational education helps (1) keep youth in school, (2) acquire employment, (3) raise their level of income, and/or (4) stimulate their involvement in postsecondary education.

Retention

The results are mixed in most studies assessing the effects of vocational education upon keeping at-risk students in school. Most of the literature cites the difficulty of attributing the decision to leave school to one particular causal factor. Further, many students have the option to quit school before reaching the eleventh grade where most vocational education programs begin. Students drop out for a wide variety of reasons, only some of which are related to vocational education. In their analysis of HS&B data, Mertens, Seitz, and Cox (1982) found that for students whose demographic characteristics suggest an at-risk pattern, the more vocational education they had completed, the less likely they were to drop out. Bishop (1989) conducted further analyses of the Mertens et al. data and found that completion of one vocational education course in the ninth grade significantly reduced the dropout rate in the tenth grade from nine to six percent. Among these at-risk students, completion of one vocational education course in each of the preceding three years lowered the dropout rate in the twelfth grade from twenty to fourteen percent. In essence, the completion of a single vocational education course in grades nine through eleven raises the high school completion rate from sixty-four to seventy percent. Completion of two courses would have raised the completion rate to seventy-six percent. These are impressive figures when one considers that the completion rates for Hispanic, native American, and urban Black youth are often in the forty to fifty percent range.

In other studies, Perlmutter's (1982) investigation of matched groups of New York City students who had applied to attend specialized vocational high schools revealed that those who were admitted were more likely to graduate. Catterall and Stern (1986) found in California that students who had taken concentrated programs of vocational education were less likely to drop out than students who had taken only limited amounts of different vocational subjects.

In examining effective dropout prevention programs, Lotto (1983) found that several programs included a vocational education component. Within these programs, vocational education was one of several strategies, a small number of students were served, and the settings for the programs were nontraditional. These findings suggest that work opportunities, cooperative education, and the relevance of the curriculum offered by vocational education are likely to be factors important to influencing students' decisions to remain in school.

Labor Force Participation and Employment

In a study of the class of 1980, Campbell and his colleagues (1986) found that labor force participation and employment appeared to be more continuous for the graduates of high school vocational education than for other high school graduates. However, Black male graduates had both less continuous labor force participation and less favorable employment experiences than White males. While the sample sizes for the disabled and LEP graduates are quite small, the trend is clearly in the direction of more limited labor force participation. The President's Committee on Employment of the Handicapped (n.d.) reports an analysis of U.S. Census data which reveals that during 1984 just thirty-five percent of the working age disabled adult population was employed on a full- or part-time basis, compared to seventy-eight percent of the working age, nondisabled population.

Earnings

With respect to earnings, those youth who are employed in jobs related to their training appear to have higher hourly and weekly earnings (Campbell et al., 1986). This is essentially true for students from low SES families, as well as minority women. Vocational education completers enjoy a clear wage advantage over students from similar backgrounds not enrolling in vocational courses. When all other factors are controlled, vocational graduates from the low SES families held an earnings advantage of eleven percent.

However, the data from the Campbell study also reveals that more than half of those who completed a vocational education program in high school were working in a job unrelated to their training. Not surprisingly, those youth who continued their postsecondary education through four or more years had an earnings advantage of twenty percent over those who terminated their education following high school.

Campbell and his colleagues noted the significant gender differences that exist in earnings (e.g., White females earning from eight to twenty-eight percent less than their male counterparts). Earnings differences of about ten percent occur between males and females who are Hispanic, Black, and poor—all of whom completed a vocational education program.

Surprisingly, Campbell's study found no major earnings differences with respect to race and ethnicity, once other characteristics are controlled. Specifically, the earnings of White males did not differ significantly from those of Blacks who completed vocational education programs in high school.

Information from the 1985 Current Population Survey on the earnings of disabled labor force participants reveals that median income levels for nondisabled workers are seventeen percent higher than for the disabled. Without employing other controls, it is impossible to determine if this difference is due to educational attainment, completion of vocational education programs, or other factors (President's Committee, n.d.).

Perhaps the most significant finding in this data is the confirmation of the value of postsecondary education. It seems imperative that federal and state policy focus more directly on extending mechanisms that will enable special needs individuals completing vocational education programs in high school to persist in postsecondary education.

Further Education

The most recent National Assessment of Vocational Education (NAVE) examined a variety of data sources and found that, in general, access of special populations to postsecondary vocational education is not a problem, although Black students remain underrepresented in two-year public institutions. Minorities, women, and economically disadvantaged students are disproportionately enrolled in postsecondary vocational institutions that offer short-term training (Goodwin, 1989).

Gardner (1987) analyzed two longitudinal data sets to assess the variables associated with transition from high school to postsecondary education. He noted that, overall, a substantial degree of consistency exists in access to postsecondary education. However, when considering race and ethnicity, patterns of access are quite uneven. When academic performance is controlled, race/ethnicity does not influence postsecondary attendance. However, when examining aspirations to attend postsecondary education, applications to schools, and ways in which educational expenses are financed, there remain differences among ethnic groups. Minority and low-income students have limited

aspirations for pursuing further education and have difficulty acquiring the resources to do so. Vocational-technical education programs at the secondary level should provide greater attention to the benefits of additional postsecondary education. Effective transitional services are needed to assist special population students in locating financial aid, completing applications, and obtaining needed support services to raise their hopes for pursuing postsecondary education.

The special population students who enroll in postsecondary vocational-technical education will require considerable assistance if they are to successfully engage in formal education beyond high school. The extent to which vocational education can enhance academic attainment and provide effective transitional services will be crucial for enabling students to pursue career opportunities and/or further education.

CONCLUSIONS AND DISCUSSION

Access

Overall, this analysis suggests that access to vocational education programs for disabled students has improved in recent years, that disadvantaged and poor students continue to be significantly overrepresented in many vocational education programs, and that non- and limited-English proficient students have very little access to vocational education. While improving somewhat in recent years, the problem of gender stereotyping still pervades vocational education programs at both the secondary and postsecondary levels. As the NAVE observed, female special needs students had more limited occupational opportunities than male special needs students based on their enrollment patterns (Hayward & Wirt, 1989).

It must be noted that simple estimates of over- or underrepresentation are not in themselves indicators of inequity. The critical question is whether or not special needs students have access to quality programs which reflect realistic and high quality employment opportunities, and which provide them with the skills and knowledge needed to pursue further postsecondary vocational education and training. To ensure the latter, federal and state vocational education fiscal allocation policies must provide assurances that

the programs receiving funds prepare special needs students for employment beyond entry-level, that the preparation received reflects current workplace practices, and that basic skills and other competencies required for continued learning in the occupation are provided. Indeed, it is imperative that state and local administrators carefully define the indicators of high quality vocational-technical education and that they assure that students with special needs have access to programs that first meet this fundamental criterion.

Although the data is less reliable at the postsecondary level than the high school level, special needs students seem to be acquiring access to postsecondary vocational education at about the same rate as other vocational education students. Between thirty-six to forty percent of all the students in vocational education, including special needs students, are enrolling in postsecondary institutes or occupational programs in community colleges. Few studies have carefully examined the participation of special needs students in postsecondary education. However, Goodwin (1989) noted that minority enrollment in postsecondary vocational education tends to be concentrated in weaker, short-term programs, rather than programs which have close links with employers and may lead to associate degrees.

Finally, while the size of the school-age population is declining markedly, the diversity of the school population is growing at a phenomenal rate (Pallas, Natriello, & McDill, 1989). Projections for the class of 2000 indicate that students attending high school are more likely than those currently enrolled to be physically or mentally disabled, to live in poverty, to have poorly educated parents, to come from homes of new immigrants, or to be living with one parent for a substantial portion of time. In some urban communities, these students will represent seventy-five to ninety percent of those attending school. Further, widespread projections that the level of workplace literacy and new skill requirements are rising for most if not the vast majority of occupations make the matter of providing meaningful vocational education to these youth crucial to the potential in the United States for economic growth. The critical imperative for all educational institutions, and especially for vocational education, is to provide a rigorous, high quality curriculum which maximizes the skills and knowledge acquired by special needs students.

Program Effectiveness

It is not surprising that there is little empirical evidence to document the effects of different program approaches or components. With the rapid evolution of the civil rights agenda, federal funds have been focused on launching new programs and services that would directly and immediately aid those students who had traditionally been unserved in vocational education. SBVEs have been preoccupied with a number of policy and access issues such as assuring that matching funds are generated, that students are integrated in mainstream classes, and that inservice education is provided to staff. Without definitive mandates for research, development, and demonstrations in federal legislation, few resources have been available to ask basic questions such as "What program models are most effective in assisting different special needs students in acquiring occupational competence?"; "What are the likely outcomes for different special needs students from secondary and postsecondary vocational education?"; and Which program components are most directly related to acquiring basic academic competency, occupational or technical competency, and general employability skills?"

While a number of studies of exemplary programs have been conducted in the past five years, there appears to be little agreement in the studies as to the criteria for defining an "exemplary" or "effective" vocational special needs program. The studies have generally focused on a particular special needs population—most frequently the disabled—or on a set of programs funded under a particular federal or state program (e.g., JTPA-Youth Funds). Given the diversity of students served in these programs, it is not surprising that the anticipated learner outcomes are equally diverse, ranging from teaching prevocational and general work skills to providing occupationally specific skills in a particular field, to simply keeping students in school. Typically, these studies have used a case study approach to examine programs nominated by some group of knowledgeable leaders, usually state office consultants or state directors of vocational education or special education. From an analysis of these effective program studies, one is able to develop a broadly defined list of "components" or "practices" which tend to be supported by the case study data. However, in reviewing the studies, one frequently finds the caution that much of what is observed is unique to the setting in which the program operates. Concepts such as "administrative support" and "adequate financial support" appear to be very important, but are also difficult to identify and quantify across schools or community colleges.

In the case of some exemplary program practices such as cooperative learning and work experience opportunities, there is considerable literature which clearly supports the need for developing and documenting the practice for special needs students within vocational education. Follow-up studies of disabled students, for instance, indicate that work experience while in school is positively associated with employment following high school. Similarly, cooperative learning approaches have been found to increase academic achievement for disabled and minority students.

Outcomes

Overall, in examining student outcomes, it appears as though the differentials in earnings and labor force participation between majority groups and special populations completing high school vocational education programs are being reduced. In fact, special population graduates of vocational programs who take training-related jobs have a distinct earnings advantage over students graduating from the general track (Bishop, 1989). Earnings and employment data for disabled and LEP program completers, however, is less encouraging.

Since the anticipated outcomes for secondary and postsecondary vocational education completers are sharply different, the use of common outcome measures at both levels should be avoided. At the postsecondary level, measures pertaining to employment and earnings are quite appropriate for all students. However, at the secondary level, greater attention must be paid to assessing the ability of vocational education programs to retain potential dropouts, to motivate students toward higher levels of basic skills attainment, and to encourage students to pursue further education. As many authors have noted, such efforts will require more focus on effective guidance and counseling, on the teaching of applied academics though vocational courses, and on improving school-to-work and school-to-college transition services for the growing numbers of at-risk high school students.

RECOMMENDATIONS FOR IMPROVING STATE POLICY

As SBVEs move forward in implementing the 1990 Perkins Act Amendments, much attention will be given to serving special populations. The information and conclusions presented suggest a series of recommendations for consideration by state and local administrators. Outlined below are several strategies which would enhance access to and attainment of equitable outcomes for disadvantaged, disabled, and LEP students enrolling in vocational programs.

Improving Access

The within state allocation provision of the 1990 Amendments is based on indices or concentrations of special population students to be served. Those communities with the highest concentrations of low-income and disabled students will receive an accordingly larger share of the basic state grant (Title II) funds. When received locally, "priority for assistance (shall be given) under this part to sites or programs that serve the highest concentrations of individuals who are members of special populations" (Section 235 (b)). In planning and allocating funds to specific sites or programs within a community, consideration should be given to whether or not special population students are over- or underrepresented in the vocational education programs or sites. Historically, access to education has been measured by the extent of program enrollment by the target population. However, in more recent years, as the post-program employment and earnings of disadvantaged and other special populations remained in question, more stringent criteria for judging access and equity were advocated. Coleman (cited in Carlson, 1983) argued, for instance, that equality of education initiatives were problematic until they were able to demonstrate that all students, including ethnic and racial minorities, achieved similar levels of outcome in terms of access to the labor market and higher education. As the educational equity movement has developed over the past two decades, various measures of access have been utilized, most of which provide for only gross measures and comparisons of special population enrollment or participation.

Hoachlander, Choy, and Lareau (1985) have recommended the use of an "access ratio" as a more functional measure of access by special groups. The access ratio is "the

percentage of students of a particular type completing a particular vocational education program divided by the percentage of students of this type enrolled in the larger population" (p. 47). For instance, if four percent of the students completing agricultural mechanics in a given year were disabled, and if mainstreamed disabled students in the high school constituted eight percent of the high school enrollment, the access ratio would be .50. The ratio indicates that disabled students are underrepresented in agricultural mechanics programs at the building or school district level. Ratios less than one would identify programs where a particular category of special students was underrepresented. Conversely, programs with ratios greater than one would identify programs that were oversubscribed.

Access ratios could be computed at the school, local, and state levels, if uniform and reliable data definitions were used. Consistent definitions of "students of this type enrolled in the larger population" would also be required. At the higher levels of aggregation, states would have to use uniform student definitions. Some sticky policy issues such as the eligibility of severely or profoundly disabled students to enroll would have to be resolved as well. Further, some interpretations of ratios involving special groups with low incidence in schools or communities (e.g., deaf and blind students) have to be interpreted carefully.

The access ratio can also be a valuable tool in identifying and targeting specific vocational-technical education programs that have historically been difficult for special population students to gain access to. Based on the data presented earlier, it would seem highly appropriate to examine the access ratios for specific technical fields at the postsecondary level (e.g., supervisory management, computer information systems, and licensed nursing), apprenticeship programs, Tech-Prep programs at the secondary level, and others that appear related to high placement and earnings rates. In examining access ratios for these programs at the state and local level, administrators should also be concerned with the ratio of male-female special population enrollments. Where appropriate, recommendations should be made to focus funding and interventions on the problems of building access to traditionally male and traditionally female occupations.

The access ratio concept could be implemented at a variety of levels in the vocational education governance structure. When implemented at the level of individual local programs, it would clearly support a liberal view of providing and measuring

equitable opportunity. That is, special population students would be expected to enroll in vocational education programs in the same manner as all other students. The extent to which this is appropriate, however, depends not only on the nature and extent of the individual student's special problem, but also the capacity of the vocational education program in which they are enrolled to provide them meaningful, long-term employability skills. Better access measures such as the access ratio concept, need to be developed and tested. However, they should be used in concert with other measures of program quality and impact.

Access to appropriate vocational education programs can also be enhanced by being cognizant of other state and local initiatives designed to improve educational equity. For instance, several major cities have desegregation plans and multicultural initiatives in place featuring career magnet high schools and other similar interventions. Local vocational administrators need to allocate funds to sites and vocational education programs within these initiatives which are aimed at improving the quality of education provided via these new alternatives. (See Mitchell, Russell, & Benson, 1989, for a description of twelve exemplary urban career-oriented secondary school programs. Several of these schools were created as part of desegregation plans.)

Similarly, many states and communities have adopted plans to place disabled students in regular education programs. Many of these efforts have also focused on improving the transition from school to work for students with disabilities. In selecting sites and programs for funding, state and local vocational education administrators should identify these initiatives and provide grants which support the vocational education components of these efforts to mainstream students more effectively and systematically. These collaborative endeavors also clearly document the requirements for joint planning between vocational and special education outlined in the Perkins Act.

Enhancing Program Effectiveness

State administrators should develop guidelines which incorporate the components of effective vocational special needs programs. Fifteen components have been identified from the current literature (see Table 4). Other groups have documented the importance of

these and similar components when identifying effective practices for serving special populations.[1] State guidelines should emphasize the importance of using practices which are likely to be effective, and, more importantly, guidelines should stress the collection of evaluative information which documents whether or not selected components (e.g., basic skills tutoring) are indeed related to positive student outcomes.

State and local administrators should also develop computer-based student tracking systems which would enable them to systematically monitor the performance of students. At present, a handful of states have a student record system which enables the state agency to track student information during school years. The expansion and development of these systems would also create an excellent vehicle for documenting support services received, the nature and intensity of vocational instruction, the involvement of other agencies, educational achievement and attainment, and the post-program placement of students. Comprehensive tracking data systems would enable teachers and administrators to conduct local research on such key questions as "What support services are most related to the success of our marketing graduates with special needs?" and "What services were received by or were not available to students who dropped out prior to program completion?" State administrators should fund research and development projects which involve selected local schools and postsecondary institutions in developing and testing computer-based student tracking systems of this type.

Finally, given the widespread difficulties associated with improving vocational education programs and services for special population students, state plans for vocational education should articulate and fund a systematic approach to delivering technical assistance. Despite twenty-five years of federal legislation, the problems of effectively planning for and serving special population groups remain quite substantial. New and practicing vocational teachers are not adequately trained to deal with the diverse educational demands of students entering their programs (Pratzner, 1988). Administrators have difficulty developing and evaluating programs which are effective. State and local policymakers are perplexed by the myriad of federal regulations and reporting requirements.

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[1] The Technical Assistance for Special Populations Program of the NCRVE, University of Illinois site, has conducted a National Recognition Program for Exemplary Vocational Education Programs Serving Special Needs Populations. The National Diffusion Network of the U.S. Office of Educational Research and Improvement also validates effective educational programs and practices.

To overcome these difficulties, state boards should develop a strategy for providing appropriate and adequate technical assistance services within the state. While funds for state administration and leadership are more limited under the 1990 Amendments, consideration should be given to special contracts with state universities to provide consultant services, inservice education, on-site program evaluation and planning assistance, public awareness materials, new curriculum materials development, and various other forms of assistance to local teachers, administrators, and counselors.

Developing Performance Outcomes

Based, in part, on the accountability provisions of the JTPA, the 1990 Perkins Amendments require the state board to implement a system of core standards and measures which examine the performance of both secondary and postsecondary programs. Developed by a Committee of Practitioners, the measures are to include student learning outcomes (e.g., measures of learning and competency gain) and indicators of program performance (e.g., training-related placement and program completion rates). The effects of any "incentives or adjustments designed to encourage service to targeted groups or special populations" (Section 115 (b)) are also to be part of the performance standards and measures applied to local programs.

The extent to which special population students achieve the learning and labor market outcomes cited as relevant for other students is a critical issue. To be successful, students with special needs must attain the skills and knowledge expected by employers of any applicant. The important consideration for vocational education programs is knowing the extent to which students receiving special assistance are achieving the outcomes needed to enter the competitive labor market. Thus, any system for measuring performance outcomes must be capable of determining and relating two elements: the educational and performance outcomes being achieved and the nature and extent of support services being provided. If the outcomes are below the standards set, then additional or more intensive support services are warranted. If performance outcomes are exceeding the standards, two alternatives exist: the standards can be adjusted or the level of support services provided can be reduced. In district-wide assessments, this might mean shifting resources and

special services to other schools or programs where special needs students might be performing less effectively.

Implementing this approach to outcomes assessment will require the development and use of the computer-based student tracking systems described earlier. The U.S. Department of Education and/or state departments will have to provide leadership in developing this important technology for program planning and assessment.

An inherent danger in establishing performance standards for vocational education programs is the establishment of the "creaming" phenomenon. In the selection and admissions process, there exists a natural incentive for enrolling students who are most likely to meet the standards set for program performance with minimal effort from the instructor or with a minimal commitment of support services. Evans (1988) contends that incentives for creaming will be reduced if program evaluations are based on trainee gains in performance and attitudes. Performance measures which document the "value-added" by participation in a vocational education program need to be considered by administrators and the Committees of Practitioners. In economically depressed or urban areas, one performance measure worth considering would be the resources required to reduce the dropout rate by five or ten percent. With a specific dropout prevention program in place which employs a vocational education approach, one could readily determine the costs, benefits, and outcomes associated with the investment. The California Peninsula Academies program (which combines vocational and academic instruction), for example, has been subjected to rigorous cost-benefit analyses by Stern, Dayton, Il-Woo, and Weisberg (1989). Using a matched comparison group for each group of students at eight program sites throughout California, the number of dropouts saved was estimated along with the costs and benefits to society. The estimated net benefit of dropout prevention efforts focused on 327 graduates was between $1.0 and $1.3 million. Because of this, performance measures which document the cost-benefit and value-added elements of programs serving special population students merit serious consideration by administrators.

Finally, the concept of access ratios described earlier can and should be applied to outcome measures by vocational educators. As Coleman (cited in Carlson, 1983) argued, access to education is a necessary but insufficient condition for judging whether or not schools are providing equitable opportunity. Until special population students achieve employment, earnings, and further education outcomes commensurate with those being

achieved by other students, the complex challenges of achieving equity will remain in the forefront of vocational education policy.

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APPENDIX

Summary of the Effective Program Studies

The general strategy for this phase of the study included conducting several ERIC searches for exemplary program studies, examining recent literature reviews in vocational special education, reviewing the literature on effective secondary school practices and instruction, and conducting several telephone interviews with state-level consultants and researchers. The literature describing effective instruction in secondary schools was drawn from empirical studies which involved adequate numbers of students—both special needs and non-special needs students—and which were focused on specific instructional interventions (e.g., cooperative learning).

The following are brief summaries of the major studies of effective vocational education programs serving students with special needs:

Eagle, E., Choy, S., Hoachlander, E. G., Stoddard, S., & Tuma, J. (1987). *Improving the options of handicapped students in mainstream vocational education.* Berkeley, CA: Institute for the Study of Family, Work, and Community.

This study is a review of thirty occupationally specific vocational programs serving handicapped students in regular classes. The programs were identified through a nomination strategy and represent a national sample of six states. Aggregate data is given concerning the individual programs and a table is provided describing the specific students served in each program.

Friedenberg, J. E., Gordon, R. A., & Dillman, M. A. (1988). *Conduct intake assessment for LEP vocational students.* Columbus: National Center for Research in Vocational Education, Ohio State University.

This document is a training manual (one in a series of four) based on identified elements of effective vocational education programs for LEP students. It is written in workbook form and is designed for individuals interested in implementing a vocational program for the LEP population. The effective program elements were identified through a literature review and site visits.

Gugerty, J. T., Tindall, L. W., Heffron, T. J., & Dougherty, B. B. (1988). *Profiles of success: Serving secondary level special education students through the Carl D. Perkins Vocational Education Act, 12 exemplary approaches.* Madison: University of Wisconsin-Madison, Vocational Studies Center.

This study examined in detail twelve exemplary programs for handicapped students. The programs were identified through an initial national nomination strategy and subsequent site visit recommendations. Each of the twelve programs is discussed individually and described in specific detail.

Hoachlander, E. G., & Stoddard, S. (1987). *What works and why: Employment training programs in the Bay area.* Berkeley, CA: Institute for the Study of Family, Work, and Community.

This study examined twelve employment training programs in and around the San Francisco Bay area identified by employers as exemplary. The authors identified three elements that were consistent with all of the programs they observed: organization, implementation, and personnel. Summary data is compiled for the twelve programs and tables are given describing the focus and specific population served through each program.

Parks, M. A., McKinney, F. L., & Mahlman, R. A. (1987). *Characteristics of effective secondary vocational education programs for special populations.* Columbus: National Center for Research in Vocational Education, Ohio State University.

This study identified the characteristics (practices) of effective vocational education programs for special needs students at the secondary level. The characteristics were identified by the researchers after an extensive literature review and site visits to exemplary programs nominated by state agency administrators. The list of effective program characteristics cuts across all special needs populations. Each characteristic is discussed in detail.