A study was conducted to identify, assemble, and summarize all studies on the effects of vocational education that were reported from 1969 to 1979. Computer searches, reviews of bibliographies, card catalogues, direct solicitation of reports, and consultant recommendations yielded 117 local, state, regional, and national studies that met the criteria for the review. Studies were categorized according to the type of dependent variable that they addressed, as well as the level of schooling. The dependent variables fell into three broad categories: employment, education, and ancillary effects. In the area of employment effects, the results suggested that a higher percentage of vocational graduates (compared with nonvocational graduates) are employed upon graduation from high school; however, the unemployment rates for the two groups are not significantly different. At the postsecondary level, two comparative studies found that postsecondary vocational education graduates experienced less unemployment than did individuals who did not have postsecondary training or who were enrolled in a nonvocational postsecondary program. In the area of educational effects, all twenty-one of the state and local studies that addressed satisfaction with training at the secondary level reported that the majority of the vocational students were satisfied with their training. (LRA)
The effects from participation in vocational education are probably the most debated policy questions relevant to vocational education. Because of the importance of these questions, vocational education has been the subject of a great many exhaustive studies. Unfortunately, many of these studies have not been readily available. The existing reviews have tended to emphasize a selected sample of the better known studies, often based on national data bases such as the National Longitudinal Surveys of Labor Market Experience and the National Longitudinal Study of the High School Class of 1972 (Grasso and Shea, 1979a and b). There remained among researchers who are interested in such reviews a feeling, or sense, that there were a great many more unreported studies which would permit greater certainty in the conclusions drawn as to the effects of vocational education.

The present study was conducted to attempt to identify, assemble, and summarize all studies on the effects of vocational education that were reported from 1968 through 1979. The steps that were taken to identify and assemble all relevant studies included: computer searches, reviews of bibliographies, card catalogues, direct solicitation of reports, and consultant recommendations. Although the search was quite comprehensive, readers will have to judge for themselves whether the inclusion of any additional studies would significantly alter the conclusions derived from the studies that were reviewed.

The search produced nearly 1500 titles that were screened to eliminate irrelevant studies and to determine those studies that met the following criteria for methodological rigor: had a sample size over twenty-five, included an adequate description of its methodology, had a response rate of 40 percent or more (or the researcher reported on nonrespondents), and included some standard of comparison (e.g. vocational vs. nonvocational students).

The 117 local, state, regional and national studies that met the above criteria form the basis of this review. They were categorized according to the type of dependent variable that they addressed, as well as the level of schooling (i.e. postsecondary vs. secondary). The dependent variables fell into three broad categories: employment, education and ancillary effects.

Employment Effects

Employment effects included unemployment rate, training-related placement, earnings, employee satisfaction, and employer satisfaction.

Unemployment

Secondary. Eleven of the state and local studies compared the employment experiences of vocational and nonvocational high school graduates (Burgess, 1979; Career and Vocational Education System, 1978; Copa, Irvin & Maurice, 1976; Dinger, Meyers & Berner, 1973; Duval County School Board, 1979; Herrnstadt, Horowitz & Sum, 1979; Hu, Lee, Stromsdorfer & Kaufman, 1968; Katz, Morgan & Drewes, 1974; Kaufman & Lewis, 1972; Oregon Department of Education, 1975; Swanson, 1976). The results suggested that a higher percentage of vocational graduates are employed upon graduation from high school, however, the unemployment rates for the two groups are not significantly different. Some of the studies based on the national longitudinal data (Grasso & Shea, 1979b; Parnes, Miljus, & Spitz, 1970; Kohen, 1970; Center for Human Resources, no date) reported no labor market advantage for male vocational graduates, however, female vocational graduates did experience less unemployment than their general curriculum peers. Based on the Class of 1972 data base, Creech (1977) and Fetters (1975) reported positive labor market experiences for both sexes.

Nineteen state and local studies reported differences among vocational program areas (Bice & Brown, 1973; Career and Vocational Education System, 1977; Durkee, 1975; Elson et al., 1976; Elson, 1978; Elson & Gerken, 1979; Enoch, 1977; Felstehausen et al., 1973; Haynes, 1970; Henry, 1974; Katz et al., 1974; Loeb, 1973; Molnar, Pesut & Mihalka, 1973; Parker, Green, Gonzales, Trujillo & English, 1978; Parker, Whelan, Gonzales, Trujillo & English, 1979; Parker, Whaley & Uranga, 1977; Preston, 1976; Tatham et al., 1975; Terry, 1975). The results indicated that health and home economics graduates consistently had the highest unemployment rates. The high rate reported for home economics is probably an artifact of the failure to distinguish between home making and occupational home economics. Using the national level Project Metro data, Eninger (1972) reported the lowest rate of unemployment for the technical area.

Postsecondary. At the postsecondary level, two comparative studies found that postsecondary vocational education graduates experienced less unemployment than did individuals who had no postsecondary training or who were enrolled in a nonvocational postsecondary program (Bowlby & Schriver, 1969; Delvaney, 1974). A third comparative study by Shymoniak (1972) found that selected vocational areas had lower unemployment rates than general graduates (i.e. office, trade and industry, and technical). A national study of graduates of 103 technical and vocational colleges reported an overall unemployment rate of only 2.5 percent (Gartland & Carmody, 1970).
The results of nineteen state and local studies that examined unemployment rates for postsecondary graduates by program areas support the finding that vocational education graduates tend to have low unemployment rates (Baratta, 1978; Bice & Brown, 1973; Clark, 1975; Department of Occupational Education and Technology, 1977; Division of Postsecondary Vocational Education, 1975; Eyler, Kelly & Snyder, 1974; Gammel, Brodsky, & Alfred, 1976; Goodman, 1975; Hall, Gray & Berry, 1975; Larkin, 1977; Parker et al., 1979; Preston, 1976; Quanty, 1976; Research Office, Southwestern College, 1974; Roberts, 1974; Shymoniak, 1972; University of Hawaii, 1972; Wilms, 1975; Wisconsin Board of Vocational, Technical & Adult Education, 1979). No differences by program area were notable at the postsecondary level, in contrast to the secondary level.

**Training-Related Placement**

**Secondary.** A majority of secondary-level vocational students find employment that is related to the occupational area in which they were trained. Of the ninety-eight separate percentages reported in twenty state and local studies, 72 were over 50 percent and 48 were over 70 percent (Bice & Brown, 1973; Career and Vocational Education System, 1977; Conroy & Diamond, 1976; Department of Occupational Education and Technology, 1977; Durkee, 1975; Elson, 1978; Elson et al., 1976; Elson & Gerken, 1979; Enoch, 1977; Felstehausen et al., 1973; Haynes, 1970; Katz et al., 1974; Loeb, 1973; McCowan, Mongerson & Carter, 1971; Nassau County, 1973; Parker et al., 1977; Parker et al., 1979; Richardson & McFadden, 1975; Tatham et al., 1975; Terry, 1975). The highest rates of placement were associated with health and business and office graduates.

National studies found that a majority of vocational education graduates obtain jobs related to their training (Eninger, 1972; National Center for Education Statistics, 1975; Tabler, 1976).

**Postsecondary.** A majority of the postsecondary level vocational students also find employment that is related to the occupational areas in which they were trained. In fourteen state and local studies, 62 separate percentages were reported; 57 of these were greater than 50 percent and 49 were greater than 70 percent (Bice & Brown, 1973; Carter, 1975; Clark, 1975; Davison, 1968; Florida State Advisory Council, 1976; Gammel et al., 1976; Hall et al., 1975; Larkin, 1977; Parker et al., 1979; Quanty, 1976; Research Office, Southwestern College, 1974; Roberts, 1974; University of Hawaii, 1972; Wisconsin Board of Vocational, Technical and Adult Education, 1979). No differences by program areas were noted.

One national study found that 74 percent of the respondents were employed in training-related occupations (Noeth & Hanson, 1976).
Earnings

Secondary. Secondary level vocational education in some circumstances appears to confer an initial earnings advantage, but this advantage does not last more than a few years. The earnings variable is one which is particularly subject to a variety of influences beyond the effect of vocational education itself. Burgess (1979), Copa et al. (1976), Herrnstadt et al. (1978), and Katz et al. (1974) reported no difference between vocational and nonvocational graduates in earnings. In contrast to these studies, Hu et al. (1968), Market Opinion Research (1973), and Swanson (1976) reported that vocational education graduates earned higher wages than nonvocational graduates relatively soon after graduation from high school, but that this advantage was dispelled over time. In state and local studies that examined vocational program differences, the area of trade and industry was most frequently associated with the highest earnings, and home economics was associated with the lowest earnings (Elson, 1978; Hu et al., 1968; McCowan et al., 1971; Parker et al., 1979; Richardson & McFadden, 1976; Troutman and Breshears, 1969).

Using the NLS data, Grasso and Shea (1979b) concluded that curriculum has little effect on earnings for male vocational graduates but female vocational graduates tend to outearn their peers. Based on the Class of 1972 and Project Talent data, Conroy (1979) reported that vocational graduates outearn nonvocational graduates. Eninger (1972) found that trade and industry graduates had the lowest earnings, thus confirming the state and local studies' findings.

Postsecondary. Insufficient information is available to draw conclusions on the impact of postsecondary vocational education (as compared to nonvocational education) on earnings. Schriver and Bowlby (1971) reported that postsecondary vocational graduates outearned secondary (not necessarily vocational) graduates, and Shymoniak (1972) found that community college office and trade and industry graduates outearned general graduates. He did not find any differences between general graduates and any other vocational program areas.

Differences in earnings were notable for vocational programs in six studies (Baratta, 1978; Division of Postsecondary Education, 1975; Goodman, 1975; Parker et al., 1979; Quanty, 1976; Wisconsin Board of Educational, Technical and Adult Education, 1979). The technical program was associated with the highest earnings in five of the six studies.

Employee Satisfaction

Secondary. Job satisfaction is one of the most frequently measured variables in follow-up studies, and virtually all studies agree that former secondary level vocational students are satisfied with their jobs (Burgess, 1979; Conroy & Diamond, 1976;
Felstehausen et al., 1973; Herrnstadt et al., 1979; Katz et al., 1974; Kaufman & Lewis, 1972; McCowan et al., 1971; Richardson, 1975).

The satisfaction of both vocational and nonvocational graduates is usually found to be in the upper ranges of the measures that are used. Based on the Class of 1972 data, Tabler (1976) reported that the combined percentages of vocational-technical students satisfied or very satisfied with selected aspects of their jobs were higher than those for general or academic students.

Postsecondary. Former postsecondary vocational students also report being satisfied with their jobs (Ballo, 1971; Conroy & Diamond, 1976; Von Stroh, 1968; Wilms, 1975). The results suggest that vocational graduates' satisfaction is comparable to or greater than that of graduates from other curricula.

Employer Satisfaction

Secondary. Employers report being satisfied with the preparation of graduates of secondary vocational programs and in some cases more satisfied than with other comparable entry-level workers (Blackford, Ruch, Aheran, & Seymour, 1979; Enoch, 1977; Felstehausen et al., 1973; Iowa Department of Public Instruction, 1979; Kaufman & Lewis, 1972; Market Opinion Research, 1973; Molnar et al., 1973; Parker et al., 1979; Report to the Iowa Department of Public Instruction, 1977; Schowalter, 1974).

Postsecondary. Similar to the secondary level, postsecondary vocational graduates were rated positively by employers. A study of secondary and postsecondary vocational graduates from Iowa reported that vocationally trained employees were considered "better prepared" by employers than nonvocationally trained employees on job skills, technical knowledge, basic reading, and verbal skills (Report to the Iowa Department of Public Instruction, 1977). Hodges (1973) found that graduates of an agricultural mechanics program were rated above other entry-level workers. Parker et al. (1979) reported no differences by vocational program areas in employers' ratings of satisfaction.

Education Effects

Education effects included satisfaction with training, continuing education, basic skill attainment, and dropout prevention.

Satisfaction with Training

Secondary. All twenty-one of the state and local studies that addressed this variable reported that the majority of the vocational students were satisfied with their training (Ballo,
1971; Bergstrand, Esser & Nelson, 1979; Burgess, 1979; Career and Vocational Education Section, 1978; Dinger et al., 1973; Duval County School Board, 1979; Elson, 1978, Elson & Gerken, 1979; Elson et al., 1976; Enoch, 1977; Felstehausen, 1973; Katz et al., 1974; Kaufman & Lewis, 1972; Loeb, 1973; Market Opinion Research, 1973; McCowan et al., 1971; Richardson, 1975; Robon, 1977; Swanson, 1976; Troutman & Breshears, 1969; Wilms, 1975). The percentage of satisfied graduates was generally between 80 and 90 percent, supporting the hypothesis that vocational graduates perceive their training as satisfactory.

Two national studies also confirmed these findings. Grasso and Shea (1979b) and Nolfi et al. (1977) both reported similarly positive results.

Postsecondary. Similar to the secondary level studies, postsecondary level research also indicated that a majority of the graduates report satisfaction with their training (Baratta, 1978; Carter, 1975; Clark, 1975; DeVaney, 1974; Gemmel et al., 1976; Hall et al., 1975; Hamby et al., 1978; Larkin, 1977; Preston, 1976; Quanty, 1976; Roberts, 1974; Robon, 1977; Swanson, 1976; Van Bremer, 1979; Von Stroh, 1968).

Continuing Education

Secondary. Of the eight state and local studies that compared the rate of continuing education for vocational and nonvocational groups, six found that nonvocational students continued their education at a higher rate than vocational students (Burgess, 1979; Career and Vocational Education System, 1977; Conroy & Diamond, 1976; Duval County School Board, 1979; Katz et al., 1974; Kaufman & Lewis, 1972). Two of the studies reported no difference between the groups (Market Opinion Research, 1973; Oregon Department of Education, 1975), however, this may be due to their use of a broad definition of continuing education.

The results of twenty-six state and local studies suggested that vocational Program areas do not differ among themselves in their rates for continuing their education (Bice & Brown, 1973; Conroy & Diamond, 1976; Division of Postsecondary Education, 1975; Durkee, 1975; Duval County School Board, 1979; Elson et al., 1976; Elson, 1978; Elson & Gerken, 1979; Enoch, 1977; Eyler et al., 1974; Felstehausen, 1973; Goodman, 1975; Katz, 1974; Kaufman & Lewis, 1972; Loeb, 1973; Market Opinion Research, 1973; McCowan et al., 1971; Oregon Department of Education, 1975; Parker et al., 1978; Parker et al., 1979; Parker et al., 1976; Preston, 1976; Quanty, 1976; Research Office, Southwestern College, 1974; Richardson & McFadden, 1976; Terry, 1975). The data indicate that approximately one-third of the vocational students continued their education. Results from the NLS and the Class of 1972 found results similar to those reported above (Creech, 1977; Eckland, 1976; Fetters, 1975 & 1977; Grasso & Shea, 1979b).
Postsecondary. Research on continuing education at the postsecondary level focuses primarily on community and junior college graduates who go on to four-year institutions. The results of the studies varied so much by program area that it is difficult to draw conclusions overall (Carter, 1975; Clark, 1975; Davison, 1968; Larkin, 1977). A larger percentage of trade and industry graduates tended to continue their education than did students from other program areas.

Basic Skills

Secondary. Insufficient information is available to determine the effect of vocational education on the attainment of basic skills. No studies were found that measured students' levels of basic skills before and after participation in a particular curriculum, therefore, any differences between curriculum groups might be attributable to characteristics of students prior to entry into the curriculum.

Ludeman (1976) examined the mathematical abilities of vocational and nonvocational students. He concluded that vocational education students performed better in terms of practical application of mathematics skills and slightly below average in more advanced and theoretical mathematical concepts.

Postsecondary. No studies were found that addressed basic skill attainment at the postsecondary level.

Dropout Prevention

Secondary. The research currently available is insufficient to answer the question "Does vocational education serve to retain students in school who might otherwise have dropped out?" Herrnstadt et al. (1979) reported that programs that include outside work experience provide additional motivation to stay in school. One possible explanation of this phenomenon emerged from the work of Brantner and Enderlein (1972) who found that dropouts were immature and valued prestige and security. They hypothesized that dropouts leave school because they lack the maturity to seek the advantages of education and looked to the world of work to satisfy their needs for prestige and security. Troutman and Breshears (1969) reported that students frequently drop out to take a job.

The national level data presented mixed results. Nolfi et al. (1977) found that vocational education had the highest dropout rate when compared to the academic and general curriculum. Grasso and Shea (1979b) found that young women in vocational programs were more likely to graduate from high school than their general peers; their results for young men were mixed.
Postsecondary. Using an analysis of the Class of 1972 data, Peng et al. (1977) reported that graduates of high school vocational programs were more likely than college preparatory students to drop out of their college program. This was the only rigorously conducted study that addressed this variable at the postsecondary level.

Ancillary Effects

Ancillary effects included the following variables: aspirations, attitudes and values, feelings of success, and citizenship. These variables were only addressed for secondary level education.

Aspirations

The aspirations of the majority of secondary level vocational students appeared to focus on skilled occupations that do not require a college degree (Ludeman, 1976). Approximately one-third of the vocational students did plan to attend college (Strickler, 1973). The results of four national studies tended to support this trend, with fewer vocational than nonvocational students planning to attend college (Grasso & Shea, 1979b; Fetters, 1974a & 1976; Zeller, 1970).

Attitudes and Values

The attitudes of secondary level vocational graduates appear to be positive toward the value of their courses and course content (Market Opinion Research, 1973). Strickler (1973) reported no significant difference in occupational values between vocational and nonvocational students. Grasso and Shea (1979b), based on the NLS data, reported that thirteen times as many young men mentioned vocational courses favorably as unfavorably when asked to name their best and least liked courses. Five times as many females gave vocational and commercial subjects a positive rather than negative rating.

Feelings of Success

No significant differences were found for feelings of success between secondary level vocational and nonvocational students (Market Opinion Research, 1973). Based on the Class of 1972 data, Fetters (1974b; 1975) supported the finding that vocational graduates feel positively about themselves.
Citizenship

No significant differences were detected in the voting behavior of vocational and nonvocational secondary education graduates (Conroy & Diamond, 1976; Hu et al., 1968). The rate of voting behavior was low for both groups, suggesting that, generally, citizenship behavior should receive more emphasis.

Summary

The following is a summary of the major findings of this review:

- No difference in unemployment rates were found for vocational and nonvocational high school graduates. Post-secondary vocational graduates generally had lower unemployment rates than did their nonvocational peers.

- A majority (over 50 percent, usually closer to 70 percent) of secondary and postsecondary vocational graduates obtained jobs in training-related areas.

- Mixed results were reported for earnings. Some studies reported no differences between vocational and nonvocational graduates; others reported an initial earnings advantage for vocational graduates which disappeared over time. Trade and industry graduates at the secondary level and technical graduates at the postsecondary level consistently had higher earnings than graduates of other vocational programs. A majority of employers were satisfied with vocational graduates; a majority of graduates were satisfied with their jobs.

- Insufficient information was reported to draw any conclusions concerning basic skill attainment and dropout prevention.

- About one-third of vocational graduates continued their education beyond the secondary level, while almost twice as many nonvocational graduates did so.

- Vocational graduates were satisfied with their training.

- Vocational graduates reported feeling good about themselves.

- Civic activity (e.g., voting) was infrequent for both vocational and nonvocational graduates.

Estimating the long-range effects of any educational experience is probably the most difficult problem in all of educational research. When the outcomes of interest are subject to many influences over which the education program has little or no control, the difficulties are multiplied many times. Although
it is recognized that more and better research is needed, it is always needed. Those who wish to withhold judgments until the definitive research has been performed will have a very long wait. None of the studies included in this review, nor all of them in combination, can provide definitive answers on the effects of vocational education. The summary of the results across many studies can, however, suggest certain effects that appear likely to have been due to participation in vocational education.
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Note: This paper is based on Mertens, D. M., McElwain, D. Garcia, G., & Whitmore, M. The Effects of participating in vocational education: Summary of studies reported since 1968. Columbus, Ohio: The Ohio State University, The National Center for Research in Vocational Education, 1980. It was supported in part by Contract No. OEC-300-78-0032 from the Department of Education, Office of Vocational and Adult Education.