DOCUMENT RESUME

ED 215 174 CE 031 973

AUTHOR Weber, James M.; And Others
TITLE A Quantitative Study of Basic Skills and Vocational Education.
INSTITUTION Ohio State Univ., Columbus. National Center for Research in Vocational Education.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC.
PUB DATE Jan 82
CONTRACT 300-78-0032
NOTE 280p.

EDRS PRICE MF01/PC12 Plus Postage.
DESCRIPTORS *Basic Skills; Comparative Analysis; Dropout Characteristics; Dropout Programs; Dropout Research; *Dropouts; Educational Research; Literature Reviews; Outcomes of Education; Potential Dropouts; Program Development; *Program Improvement; Secondary Education; *Secondary School Students; Skill Development; Student Participation; Teaching Methods; *Vocational Education

ABSTRACT

This report represents a synthesis of existing data on the basic skills of vocational students. An introduction provides background information, lists objectives, and describes the framework and methodology for the literature review and acquisition and analysis of four data bases: National Assessment of Education Progress, Supplemental Mathematics; American College Testing Program; Longitudinal Study of Education Effects; and High School and Beyond. Part 2 summarizes data regarding two project objectives: (1) to analyze data for secondary students in relation to four issues (describing basic skills proficiencies of secondary-level vocational students; comparing their basic skills levels with those of other students; describing how participation in vocational education relates to changes in students' basic skills levels; and explicating relationships among students' basic skills levels, participation in vocational education, and various vocational outcomes) and (2) to review strategies for improving vocational students' basic skills proficiencies reported in the literature. Part 3 focuses on the second objective above and on the objective to analyze data for secondary school dropouts relative to relationships between dropping out and the four issues in the first objective. Appendixes include a reference list; abstracts of empirical studies; and materials concerning dropouts, their characteristics, and strategies for dropouts. (YLB)

A QUANTITATIVE STUDY OF BASIC SKILLS AND VOCATIONAL EDUCATION

James M. Weber
Cindy Silvani-Lacey
E. Jane Williams
Patricia Worthy Winkfield
Kevin J. Manning
Karen Okeafor
Denie Denniston

The National Center for Research in Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

January 1982

THE NATIONAL CENTER MISSION STATEMENT

The National Center for Research in Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning, preparation, and progression. The National Center fulfills its mission by:

- Generating knowledge through research
- Developing educational programs and products
- Evaluating individual program needs and outcomes
- Providing information for national planning and policy
- Installing educational programs and products
- Operating information systems and services
- Conducting leadership development and training programs

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

FOREWORD

Vocational educators have been aware of the marked decrease in the quality and quantity of secondary level students' basic skills for some time. Recently, their awareness has been heightened by the specter of increasing unemployment. The combination of few or no basic skills and no gainful employment paints a frightening picture of the future for students who have not enjoyed the full benefits of the educational system, either because they were inadequately served or because they opted to leave school. For these students, the problem is even more acute.

This report represents a synthesis of existing data on the basic skills of vocational students. It should provide vocational researchers, administrators, and practitioners with some useful insights to future directions for research as well as the development of both teacher education and curriculum materials. In addition it should help educators determine how best to reverse the decline in basic skills achievement. Policy makers should also find this aggregation of data useful in projecting and establishing educational trends.

The National Center is indebted to Lucille Campbell-Thrane, Associate Director, and to research specialists Frank Pratzner, Dan Fahrlander, and Allen Meyer for their helpful reviews and suggestions. Special thanks to Deborah Black who spent many hours typing the manuscript.

Robert E. Taylor
Executive Director
National Center for Research
in Vocational Education

EXECUTIVE SUMMARY

Basic skills are essential to successful participation in today's society. For example, they are crucial to acquiring further education and training, demonstrating employability and occupational competence, and attaining upward mobility. Given their importance to functioning in our society, basic skills represent a critical area of learning that should be fostered in all secondary education programs, including vocational education.

Analyses of school performance, job proficiency data, and standardized test scores suggest that the basic skills attainments of secondary vocational students in today's schools are declining. Precursory literature reviews, examinations of different research studies, and other efforts to address this problem have revealed that a serious lack of systematic information exists regarding such issues as (1) "What level of basic skills attainment characterizes secondary vocational students," (2) "How does participation in vocational education affect basic skills attainment, if at all," (3) "How do the basic skills levels of vocational students compare with those of nonvocational students," and (4) "What relationships, if any, exist among secondary students' basic skills, participation in vocational education, and such outcomes as completing school, earnings, employment, and securing additional training."

The study described in this report represents an attempt to assemble and summarize extant data that bear upon these issues. These data were secured through an extensive search of published studies as well as the solicitation of "off the shelf" data sets

from a diverse sample of local and national level education agencies. During the course of the study, these data were processed and analyzed, and the results used as the basis for a series of conclusions and recommendations. In the materials that follow the general conclusions and recommendations yielded by the data are provided.

Conclusions

- The average performance of secondary vocational students on standardized basic skills measures appears to be somewhere between the 35th and 40th percentiles (or about one half a standard deviation unit below the average for all secondary students). Using the decision rules currently available, this discrepancy in average performance would be deemed both statistically and educationally significant.
- The basic skills levels of students in different vocational programs vary significantly. The performance of students enrolled in business is generally higher than that of students enrolled in agriculture, health, technical, and trade and industrial programs, which in turn is generally higher than that of students who were enrolled in distributive education and home economics.
- The average basic skills attainment of secondary vocational students is typically (a) significanyly lower than the attainment of academic or college preparatory students and (b) comparable to the attainment of general students.

- The changes in basic skills performance (e.g., from program entry to exit) observed for vocational and nonvocational (both academic and general) students do not differ significantly.
- Vocational (as well as nonvocational) students' average basic skills attainment did not change significantly between the points of program entry and exit.
- The severely limited and unreliable nature of the available data made it impossible to reach any firm conclusions regarding the relationships between participation in vocational education and such outcomes as gaining employment, earnings, and securing additional training.
- The average performance of potential and actual secondary school dropouts appears to be at or near the 25th percentile or at a grade equivalence level of 5.4.
- The performance of dropouts in the reading and mathematics areas appear to be equally poor, and sufficient data are not available to reach any firm conclusions regarding other basic skills.
- The basic skills levels of high school dropouts average significantly lower than those of completers.
- When potential and actual dropouts are afforded the opportunity to participate in vocationally oriented programs that have an integrated basic skills component, their basic skills attainment will usually increase substantially.

- The scarcity of data concerning relationships among selected outcomes (like being employed, earnings, and securing additional training), dropping out of school, and participation in vocational training programs that incorporate a basic skills component made it impossible to reach any related decisions.

Recommendations

- Additional research dealing with the ramifications of the "less than average" basic skills attainment exhibited by vocational students needs to be undertaken. The available data indicate that vocational students' basic skills levels are typically below average, but fail to yield significant insights regarding either the level of basic skills deemed essential to successfully perform various occupational tasks or the sufficiency of the basic skills levels exhibited by vocational students relative to such a set of "standards."
- Improved data collection and evaluation strategies related to the basic skills attainment of vocational students and associated instructional efforts need to be identified and utilized.
- Innovative and potentially effective strategies for incorporating basic skills instruction in vocational settings need to be either identified or developed and evaluated.
- More efficient and effective dissemination mechanisms need to be developed to exchange information regarding

basic skills programs and materials that have been shown to be effective.

- The development of vocationally-related basic skills instructional programs and materials in such areas as writing, listening, and oral communication needs to be fostered.
- Specific strategies need to be developed and evaluated for encouraging interdisciplinary cooperation among educators who are involved in improving the basic skills of vocational students.
- Teacher education programs, those for vocational educators and basic skills specialists, need t incorporate both philosophical and pedogogical information as well as different techniques for dealing with the unique needs and problems of vocational students in the area of basic skills.
- Additional research needs to be undertaken into the unique characteristics and concerns of vocational students that may affect their acquisition of the basic skills needed to succeed both in school and on the job.
- When dealing with dropouts, particular consideration should be given:

    (a) to ensuring that the goals and objectives for the basic skills, vocational training, and career education components of any program are very clear and well "spelled out";

(b) to identifying potential dropouts early (e.g., by the fifth grade), but in as unobtrusive a manner as possible;

(c) to developing and evaluating instructional programs comprised of two articulated components, i.e., a pre-secondary and a secondary component;

(d) to utilizing individualized instruction or materials and techniques that can be adapted for use via such a mode;

(e) to exploring the benefits and problems of innovative flexible program delivery;

(f) to researching and delineating the contributions of various support services to the overall effectiveness of program delivery;

- Additional monies need to be allocated to conduct the kinds of research and development activities noted above as well as to more generally foster improvement in basic skills instruction in vocational settings, particularly at the local level.

PART I

INTRODUCTION

Background

A solid foundation in basic skills[1] is essential for successful participation in today's society. For example, these skills are crucial to acquiring further education, demonstrating occupational competence and employability, and attaining upward mobility. Given their importance to functioning in our society, basic skills, in concert with occupational skills, represent one of the critical areas of learning to be fostered by our entire educational system.

Such a perspective is clearly reflected in recent priorities established by the Office of Vocational and Adult Education in the U.S. Department of Education:

> Basic educational skills are essential to all persons and vocational education must complement basic skills/remedial programs if persons are to succeed in vocational education programs. . . Both academic and vocational programs should complement and further one another in producing persons who are prepared to function in a working world (Federal Register, June 13, 1979, p. 33961).

This belief regarding the complementary nature of basic skills and vocational preparation is also supported in a number of research studies and related reports (e.g., Carnegie Council on Policy Studies in Higher Education 1979; Thurow 1979; Mertz 1979; Clark 1979; Bottoms 1979; and Sawhill 1979).

---

1. For the purpose of this document, basic skills refers to reading, mathematics, oral communication (listening and speaking), and writing as designated in P.L. 95-561, Title II: Basic Skills Improvement Act.

Purpose/Objectives

Federal priorities and the results of a number of policy and research studies suggest that basic skills education is a necessary part of vocational education. Preliminary literature reviews and examinations of related research, however, reveal a serious lack of systematic information regarding such fundamental issues as the basic skills attainment of vocational students and the relationship of basic skills levels to various employment outcomes.

The purpose of this document is to address this information gap and to synthesize a heretofore diffused set of research inquiries into a framework that can be of use to teachers, program developers, administrators, policy planners, and others who are concerned with improving articulation between basic and occupational skills programs.

The objectives that are addressed in this report and that provide an organizational framework for the literature review and data analyses are as follows:

- To secure, analyze, and report data for secondary school students in relation to each of the following issues:
    1. To describe, from a national perspective, the basic skills proficiencies of secondary level vocational students.
    2. To compare the basic skills levels of secondary vocational students with those of students who are enrolled in other high school curricula.

3. To describe how participation in vocational education relates to changes in students' basic skills levels.
4. To explicate the relationships among students' basic skills levels, their participation in vocational education, and various vocational outcomes such as employment, earnings, and participation in further training.

- To secure, analyze, and report data for secondary school dropouts that deal with relationships between dropping out of school and each of the four issues listed in the first objective.
- To review strategies for improving vocational students' basic skills proficiencies reported in the literature.

Framework and Related Rationale

One of the first steps taken in addressing these objectives was to develop a framework for reviewing and organizing the research literature and data sets that were identified. A key assumption underlying that framework is that vocational education constitutes a "treatment" that affects students' basic skills proficiencies as well as their subsequent educational and occupational experiences. Typically this treatment is two, three, or four years in length. Program duration depends upon the service area, Local Education Agency (LEA), and individual state policies and requirements. This assumption is graphically illustrated for a two-year program in figure 1.

FIGURE 1

Vocational Education Viewed as a "Treatment"

GRADES:

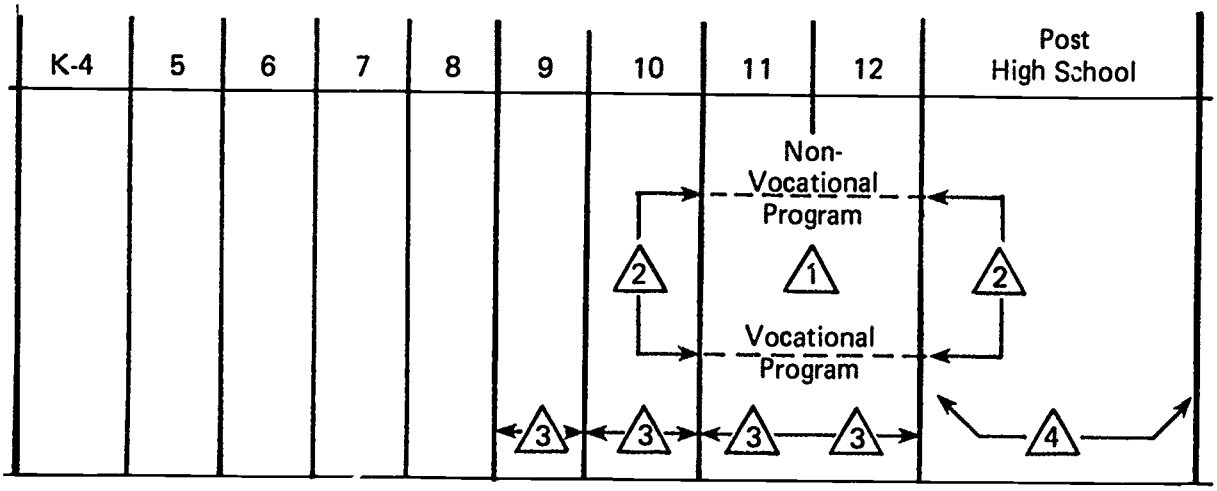
K-4	5	6	7	8	9	10	11	12	Post High School
							"Treatment" (i.e., vocational program/ experiences)		

The assumption placed both conceptual and operational limitations on the selection and interpretation of the research literature and the empirical data bases procured during the project. For one thing, the treatment has definite initiation and termination dates. Thus, the times when any basic skills measures or other criteria are administered can seriously affect the interpretation of results. For example, if a mathematics test is administered at the end of the eighth grade rather than the twelfth grade, the results will probably be significantly different, and their interpretation with regard to the treatment will certainly be different. In addition, if students were given a particular test at the end of the eleventh grade, their scores could not logically be expected to reflect what they would have experienced in the twelfth grade (e.g., the opportunity to practice and apply the basic and occupational skills learned during the initial year or two of the treatment). Such issues have served to focus and to direct the selection of specific studies and data bases described in Parts II and III of this report.

The "treatment" assumption also had direct implications for the interpretations applied to the four issues addressed in objectives 1 and 2. Figure 2 illustrates the perceived loci of effects associated with each issue in light of that assumption. For example, it shows that the most logical points at which the first issue should be addressed are when students enter a vocational program (or prior to that time) or when they leave the program. As a result, any studies or reports that include data collected at other times (e.g., during the eleventh grade) would be of limited value in addressing this issue.

FIGURE 2*

Implications of the Designated Assumption for Addressing the Study Objectives



*For the purposes of this description, vocational education is portrayed as a "treatment" of two years duration (11th and 12th grades), however, programs do vary in length, particularly across service areas, states, and LEAs. The symbols 1 2 3 , and 4 refer to the four objectives of the study listed earlier.

Methodology: Literature Review

The literature review included research studies and reports published since the mid 1960s. Approximately 2,000 studies available from libraries and computerized information bases were identified for review by means of computer searches, a search of card catalogues at the National Center, and citations from materials identified via these various sources. The computer searches, which were completed in July 1981, included the following data bases: Educational Research Information Center (ERIC), Dissertation Abstracts, Resources in Vocational Education (RIVE), National Technical Information Systems (NTIS), Psychological Abstracts, and the Ohio State University's Mechanized Information System (MIS). These mechanized searches were supplemented by manual searches of listings of Federally Administered Projects in Vocational Education, FY 1970-77, State Administered Projects in Vocational Education, FY 1978-80, and Projects in Progress: Report of Research Coordinating Units, 1979 and 1980.

The results of these various searches were crosschecked against the following sources to establish the validity and comprehensiveness of the studies located:

- Berryman, L. Vocational Education and the Work Establishment of Youth: Equity and Effectiveness Issues (N-1475-ASC). Santa Monica, CA: The Rand Corporation, 1980.
- Corman, L. Basic Skills Proficiencies of Secondary Vocational Education Students, Vocational Education Study Publication No. 4. Washington, DC: National Institute of Education, 1980.

- Long, T.E. Basic Mathematics Skills and Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.
- Mertens, D.M., et al. The Effects of Participating in Vocational Education: Summary of Studies Reported Since 1968. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.
- Thornton, L.J. Basic Reading Skills and Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

It should be recognized that in such a literature search, every study that addresses the possible relationships between participation in vocational education and basic skills proficiencies can not be located and reviewed. For example, some studies may not have been submitted to any of the computerized data bases nor reported elsewhere in the professional literature. Despite those limitations, the studies that were considered represented a wide range of research and development activities conducted to date in this particular field.

In order to select from the 2,000 initially identified studies those that focused upon the purpose and objectives listed earlier, a screening process was developed. That process, which incorporated the issues and concerns inherent in the framework described in the preceding section, served as the primary vehicle

for excluding studies that provided no relevant information (e.g., those that dealt with basic skills instruction at the elementary level or that were not related in any direct way to vocational education). The process was also used to discriminate among studies that provided relevant information on the basis of their degree of methodological rigor and the interpretability of their data bases in light of the project objectives.

The screening process included three stages or types of activities:

Stage One. During this stage, reviewers scanned titles and document abstracts of studies identified during the initial screening to determine whether the studies involved research or development activities that in some way dealt with the issue of vocational education and basic skills. At this stage, studies that did not focus upon this topic (e.g., studies that focused on such areas as teacher education or educational planning and change) were eliminated. In all, 1,913 of the 2,000 studies initially identified were eliminated.

Stage Two. At this stage, the actual documents identified during the search process were reviewed. The first step was to reaffirm that the studies emphasized issues and concerns of interest. Then the relevance of the studies and their inherent data for addressing each of the objectives were determined. It was at this point that the final decision was made regarding which studies were to be included in the report.

Stage Three. This final stage in the screening process dealt with the abstraction of more detailed and focused informa-

tion from the available documentation. For example, if a study contained information or empirical data related to an objective of this project, that information was noted. In some cases, subsets of the reported data or related statistics that dealt directly with a project objective had to be abstracted from a larger set of summary data.

The information gleaned from the selected studies consisted primarily of (a) descriptions of strategies designed to improve basic skills or of models outlining perceived relationships between vocational education and basic skills; (b) descriptions of specific instruments and procedures; (c) empirical data, such as statistical summaries; and (d) statements of findings, conclusions, and recommendations.

Although the screening process yielded many studies that are cited in this document, relatively few of them are free of methodological shortcomings. The following represent major, recurring problems or limitations in the studies:

- Most of the studies or reports cited were based upon and guided by questions and priorities that often did not coincide with those of the current project. Consequently, the findings are typically only tangentially related to the specific objectives under consideration. Considerable care needs to be exercised in interpreting and generalizing such tangentially related and "readily available" results.

- Sampling biases frequently existed in the reported data, that affected the related results. These biases included the following:
    1. Self-selection: Students choose the curriclum in which they wish to participate. As a result, systematic differences in the types of persons enrolled in various curricula may account for more of the variance observed in different variables than do the curricula themselves.
    2. Differential loss rates: When extant data sets are subdivided or reorganized to conduct analyses for which they were not originally intended, the resultant subsamples often are not representative of their respective subpopulations. For example, in the "Class of 72" data base, SAT scores are available for less than 10 percent of the 5,000 vocational students in the sample, but for about 95 percent of the 6,000 academic students.
    3. Programmatic assignments: In the last few years, students were often assigned or counseled into vocational programs when their basic skills levels were low. Such a practice would have a direct and profound effect upon the results of any study.

- Athough many remedial, research, and exemplary projects and studies were identified and appeared to have promise, limited empirical data existed in the associated project documents. Typically, extant data bases were anecdotal, and in some cases, data were not even available. Furthermore, in cases in which data did exist, it was difficult to reach any conclusions because of the lack of generalizability (external validity) of the results. This was often attributable to the uniqueness and nonrepresentative nature of their samples.
- Many of the studies included data that were collected at illogical or undiscernible points in time. For example, several studies used "derived" basic skills estimates based upon tests that students may have taken in tenth, eleventh, or twelfth grade (e.g., Grasso and Shea 1979). Others dealt with the eleventh grade, which meant that the associated vocational treatments were limited.
- The operational definitions of basic skills employed in much of the reported literature were of questionable validity with regard to assessing the basic skills required in different occupations. Typically these measures focused upon the behaviors and skills required of students who hoped to succeed in college, which may or may not have any direct relevance to the basic skills required to perform effectively in different occupations. In some instances, individual items on such measures may have even discriminated against vocational students.

In addition to the validity issue, lack of congruence is sometimes a problem as well. That is, the measures of basic skills frequently used may contain too few items dealing directly with the basic skills required in various occupations. This lack of congruence is illustrated in figure 3.

- Frequently the reported studies estimated the subjects' basic skills levels at only one point in time, usually near the end of the eleventh or twelfth grade. Since such studies did not incorporate a basic skills proficiency estimate prior to the treatment, effects attributable to the treatment could not be empirically distinguished from skills that might have existed previously.
- In many of the cited reports, the content of the basic skills programs being studied was the same--philosophically, substantively, and operationally--as that of the "normal" or "regular" programs offered at the same sites. As a result, program content may be invalid, when viewed from the perspective of critical occupational requirements or skills.

These various limitations, individually and in combination, are present in a majority of the studies reviewed. In general, they tend to obscure results and make interpretation more difficult. Thus, any conclusions or recommendations derived from the synthesis of these results will tend to be equivocal and less focused than is desirable.

FIGURE 3

Hypothetical Example of the Coverage of Mathematics Concepts/Operations on a Standardized Basic Skills Test

CONCEPTS/OPERATIONS THAT ARE:	MATH CONCEPTS/OPERATIONS*															
	Subset A									Subset B						
	1	2	3	4	5	6	7	. . .	j .	j+1	j+2	j+3	j+4	j+5	. .	k
covered by items on a standardized math achievement test					X					X	X		X	X		X
needed to perform successfully in various occupations	X	X		X	X	X	X									

*Typically these concepts/operations are assumed to be hierarchical in nature, and those in subset (a) must be "mastered" before those in subset (b) can be acquired.

Methodology: Acquisition and Analysis of Data Bases

The extant data bases that were identified, obtained, and analyzed for this project were of two kinds--national and local. In both cases, the data bases contained information that, when analyzed, yielded results related to one or more of the three objectives listed earlier.

In all, four national data bases were identified and considered by the project:

- "National Assessment of Educational Progress (NAEP), Supplemental Mathematics"--seventeen year olds (two samples), approximately 4,679 total respondents.
- American College Testing Program (ACT)--a random sample of 37,749 persons who completed the ACT during 1979 and 1980
- "Longitudinal Study of Education Effects" (Class of 1972) --a longitudinal sample of approximately 22,000 students who were high school seniors in 1972 when data collection began
- "High School and Beyond" (1980)--the base year of a longitudinal study that involved approximately 26,053 sophomores and 23,147 seniors

These data bases were identified by searching available literature and reports and by querying selected national organizations [e.g., ACT, National Center for Educational Statistics (NCES)]. After a tentative list of data bases was developed, contacts were made with the agencies or organizations that maintained them to determine the availability of the data and their applicability to the project objectives. Next, arrangements were made to obtain copies of acceptable data sets and related documentation.

Once the data sets were secured, project staff examined the associated documentation and conducted preliminary analyses in order to become more familiar with the characteristics of the data. Then the specific analyses to be conducted on each set of data were delineated. A major consideration in these decisions was the correspondences among the designated analyses and the three project objectives. Subsequently, the national data bases were analyzed using the statistical techniques delineated earlier.

A total of sixteen Local Education Agency (LEA) data bases were obtained and analyzed during the project. The locations of and other descriptive information regarding the data sets are summarized in table 1, which also contains brief descriptions of the samples of students represented in the respective data sets.

The process of obtaining and analyzing the local data bases included the following steps:

1. A tentative set of candidate LEAs was identified based upon (a) references to exemplary programs found in the reviewed literature, (b) nominations offered by personnel from state departments of education and other professionals in the field of vocational education, and (c) recommendations received by project staff during discussions at professional meetings (e.g., the American Vocational Association and American Educational Research Association conferences).
2. Once a potential site was identified, an initial, exploratory contact was made. The general purpose and

TABLE 1

Descriptive Overview of the LEA Data Bases

STATE	SITE DESCRIPTION	SAMPLE
Kansas	This site is an area vocational school located in southeastern Kansas that serves a rural area of approximately 55,000 residents	The sample consists of a total of 214 juniors and seniors who were enrolled in the school during the 78-79, 79-80, and 80-81 school years
Pennsylvania	This site is a large urban school district in southeastern Pennsylvania that serves a city of 1,820,000 residents	The sample consists of 2200 twelfth graders (a 10% sample), who were enrolled in the district during the 1980-81 school year
California (a)	This site is located in central California and serves a rural area of approximately 6,500 residents	The sample consists of 165 senior students who were enrolled in the 1977 through 1980 school years
California (b)	This site in central California serves a rural area of approximately 6,000 residents	The sample consisted of 105 senior students who were enrolled in school during the period from 1977 to 1980
Connecticut (a)	This rural site is in the southeastern area of Connecticut and serves a town of 6,432 persons	The sample consisted of 105 junior students who were enrolled in school during th the years from 1976 through 1980
Connecticut (b)	This site is in southern Connecticut and serves a rural town of 7,300 persons	The sample of 76 seniors attended the school from 1977 through 1980
Louisiana	This site, composed of four high schools, is in southern Louisiana and serves a small city of approximately 12,000 persons	The sample consists of 700 senior students who were enrolled in the four schools from 1977 through 1980
Oregon	This site is located in a large urban area in northwestern Oregon that serves a city of 300,000 residents	The sample consists of 3,294 juniors and seniors who attended the school district in the years 1980 and 1981

TABLE 1 (continued)

STATE	SITE DESCRIPTION	SAMPLE
Texas	This site is from central Texas and serves a city of between 250,000 and 300,000 persons	The sample includes 4,956 seniors from the school years of1978 through 1980
Wisconsin (a)	This site in eastern Wisconsin serves a rural community of approximately 2,045 persons	The sample consists of 119 senior students who were enrolled in the school system from 1977 through 1980
Wisconsin (b)	This site is in eastern Wisconsin and serves a rural community of approximately 700 persons	The sample includes 162 senior students from the graduating classes of 1980 and 1981
Arkansas	This site is an area career center located in central Arkansas that serves a rural community of approximately 21,000 residents	The sample of 335 senior students is for the 1979 and 1980 school years
Florida	This site, a vocational education skills center, is located in a large urban district in northeastern Florida. That district serves a city of 531,700 residents	The sample consists of 2,977 students who were seniors during the 1979-80 school year
North Carolina	This western North Carolina site is an education center that includes a vocational education program. It serves a city population of 150,000	The sample consists of 199 senior students who attended the school from 1979 through 1981
South Dakota	This rural site, a multi-district vocational career center, is located in eastern South Dakota and serves a population of 15,000 persons	The sample consists of 197 students who attended school from 1977 through 1981
Ohio	This urban site in southern Ohio serves a city of approximately 404,000	The sample consists of 836 students who were sophomores during the 1980-1981 school year when the basic skills criteria were administered

objectives of the project were explained, the specific data requirements were outlined, and a tentative agreement was reached either to participate or to explore the matter further. At the same time, a description was obtained of the kinds of project related data collected and maintained by the prospective site.

3. A formal description of the project was sent to each site that had tentatively agreed to participate. That description contained a set of data specifications developed on the basis of the initial contact, a brief description of the related documentation requirements, and an estimate of the cost to be incurred by the LEA in preparing the data set. In some cases, project staff visited potential sites to explain the project in detail and to help secure their cooperation.
4. The sites that agreed to participate sent letters expressing that intent to the National Center. Tentative cost estimates for preparing the respective data sets and projected delivery dates were also included in those communications.
5. During the time when the data sets were being prepared, project staff periodically communicated with site personnel in an effort to resolve problems and to avoid delays. In some cases, visits were made to the sites to help resolve major problems and to provide direct assistance in obtaining the required data.

6. As each data set was delivered to the National Center, project staff read the related documentation and initiated processing (i.e., had them keypunched or, in the case of magnetic tapes, had them mounted preparatory to preliminary analysis).
7. After carefully reviewing each data set and its associated documentation, project staff developed a specific analysis scheme to be used for each data set. During that development process, a major consideration was the correspondence among the planned analyses and the three project objectives.
8. Finally, the various data sets were analyzed according to the designated statistical techniques, and the results of the analyses were abstracted and summarized in tabular form for incorporation into this report.

The data sets obtained and analyzed as part of the project suffered from many of the same methodological shortcomings as the data reported in the published research studies that were described earlier. Many of those problems resulted from the fact that extant data sets were employed rather than original data sets generated specifically to address the unique purpose of the current research effort. Among the more prevalent and pervasive of these shortcomings are the following:

- Sampling biases exist in the reported data because of self-selection of students into curricula, possible assignment of students to curricula on the basis of their basic skills scores, constraints upon data collection

(e.g., the need to procure longitudinal data on the sampled students), and differential loss rates that can occur when extant data sets are subdivided or reorganized to conduct analyses for which they were not originally intended.

- The data sets available from many of the LEAs are sketchy and have major gaps. For example, follow-up data are typically quite limited or nonexistent.
- The operational definitions of basic skills employed suffer from the same validity and sensitivity concerns as were noted for the studies cited in the published literature. Also, basic skills criteria are often changed from one year to the next, which seriously complicates any subsequent comparisons.

Despite these limitations, the information available in the selected data sets is of considerable value in addressing the project objectives. Those data and the observed findings supplement and support the limited numbers of studies encountered in the published literature. This is particularly true with regard to the limited number of studies that yielded results related to issue 3 of objectives 2 and 3--the relationship between participation in vocational education and changes in basic skills attainment (e.g., changes occurring from program entry to exit).

Descriptions of Key Concepts

The following are descriptions of the key concepts and perspectives that guided the analysis of basic skills in vocational education.

Vocational education and vocational training. According to Title II of Public Law 94-482 (1976)

> the term "vocational education" means organized educational programs which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career requiring other than a baccalaureate or advanced degree.

Larson and Valentine (1976) state that

> "Vocational training" means training or retraining which is conducted as part of a program designed to prepare individuals for gainful employment as semi-skilled or skilled workers or technicians or subprofessionals in recognized occupations and in new and emerging occupations, but excluding any program to prepare individuals for employment . . . generally considered professional which requires a baccalaureate or higher degree.

For the purposes of this report, the terms "vocational education" and "vocational training" will be used interchangeably. This practice is common among vocational practitioners who, more often than not, translate the more complex language of legislative definitions into the everyday language of educational practice.

For example, Larson and Valentine (1976) state that vocational education is education for work and, as such, is an integral part of the comprehensive educational system nationwide. They list the following principles underlying current thinking about vocational education:

1. Secondary vocational education should be a developmental process intended to maximize options for employment or for further vocational training.

2. Vocational curriculum should be predicated on and validated by occupational analysis and specific objectives that take into account both individual and community needs.

3. Vocational curriculum should be flexible enough to accommodate increasingly complex occupational competency levels.

4. The vocational instructor must have recent, successful work experience in the subject matter to be taught.

5. Vocational training should utilize the same operations, tools, and equipment used in the occupation itself.

6. Vocational education should educate the students in the attitudes, skills, thinking, and manipulative requirements of the specific occupation.

7. Vocational education should allow students to learn by doing.

8. Vocational education program objectives, curriculum, and teaching environment are to be developed and evaluated in concert with advisory committees comprised of representatives from business, industry, agriculture, and labor.

9. Vocational education must provide guidance, counseling, testing, placement, and follow-up services to students.

10. Vocational education should be responsive to varying occupational choices as well as changing employer, community, economic, and personal needs and interests.

11. Vocational education should encourage students to develop leadership skills through active involvement in student organizations (pp. 5-7).

Basic Skills. Basic skills are defined in P.L. 95-561, Title II: Basic Skills Improvement Act, as "reading, mathematics, and effective communication, both oral and written." The U.S. Office of Education acknowledges that there are additional skills that are crucial to the individual, as evidenced by basic proficiency standards established by some thirty-six states to date. These proficiency standards, however, generally include the basic skills listed in the Title II definition (U.S. Department of Health, Education, and Welfare 1979).

The relationships among basic skills attainment, vocational education, and dropouts (as envisioned in this document) can be explicated by the correlation between the basic skills themselves and the student's future employment and educational potential, as depicted in figure 4.

As figure 4 indicates, individuals with minimal basic skills either face unemployment or are relegated to low-level, dead-end jobs with minimal pay. Dropouts, ipso facto, do not acquire adequate basic skills because they do not complete their secondary education programs. In addition, it is widely acknowledged that dropouts are usually confronted with unemployment as a result of their failure to complete high school.

Failure to complete high school and to find gainful employment are only two characteristics of dropouts. There are many other factors that affect not only dropouts, but also potential dropouts. In Part III of this report, these factors are described in greater detail.

Program Planning. Whirtner and Antin (1976) describe program planning as a process of

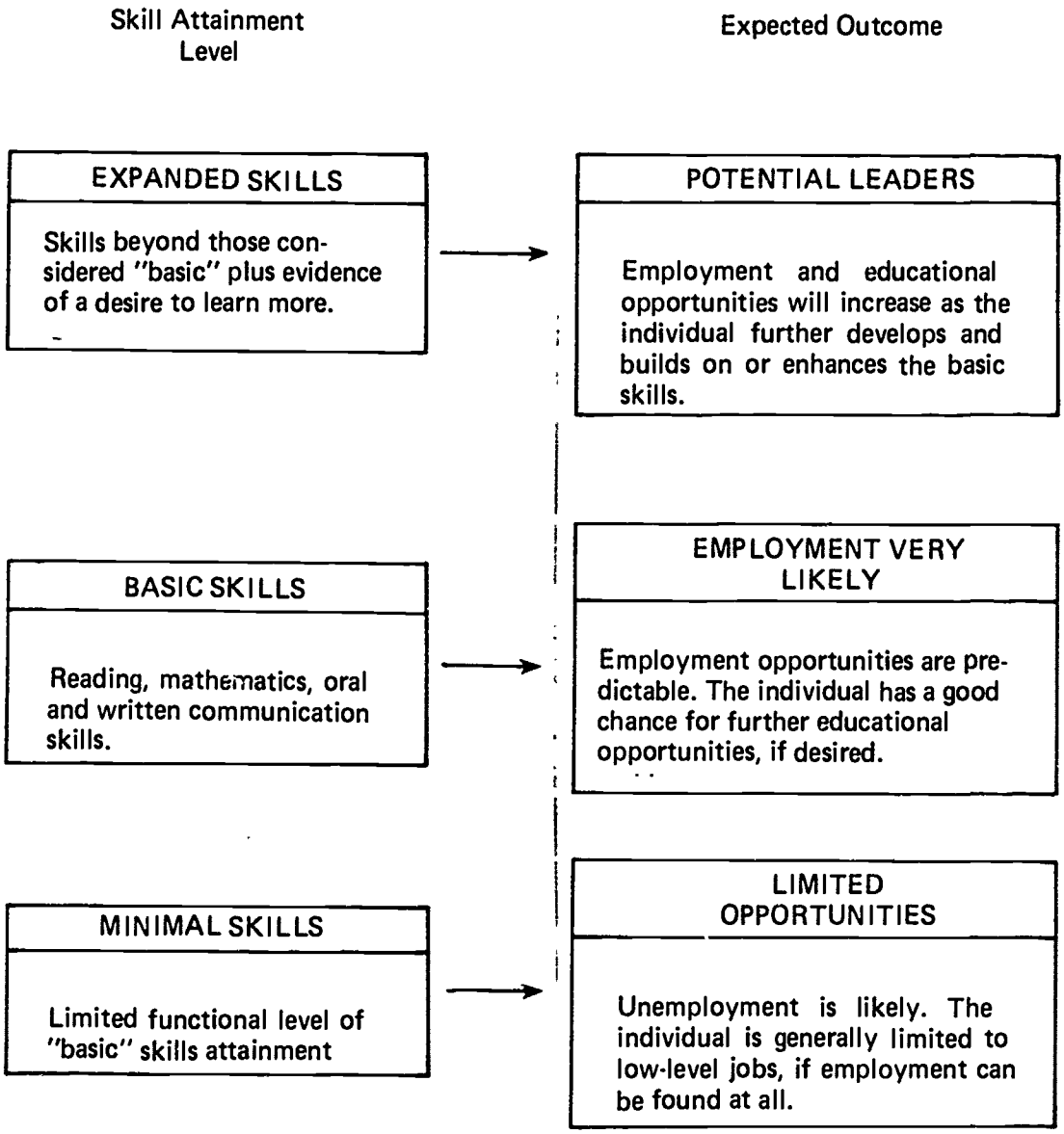
> looking toward a future point in time . . . determining what the system concerned should look like at that time . . . finding the best way to get to that point in the manner desired . . . and establishing a method of knowing whether you have accomplished the sought-after changes.

This definition is used in this report.

Program Strategy. A program strategy is a specific product of program planning. Ideally, it is the result of a systematic, problem-solving process as described under "program planning" above. Generally that product or result may be divided into four

FIGURE 4

Basic Skills and the Students Future



[Adapted from National Council of Supervisors of Mathematics, Task Force on Basic Mathematical Skills, "Position Paper on Basic Mathematical Skills" (January 1977).]

components: evaluation, instructional planning, program development, and instructional methods. Project staff have defined these categories using indicators derived from the literature review; from the Dictionary of Education, edited by Carter V. Good (1973); and Educational Evaluation and Decision Making by Daniel L. Stufflebeam (1971).

Educational Evaluation. This is considered to be "the process of delineating, obtaining, and providing useful information for judging decision alternatives" (Stufflebeam 1971, p. 40). Evaluation is concerned with the following four basic areas:

1. Context evaluation, which focuses upon an overall analysis of needs and resources around which an educational program is built
2. Input evaluation, which involves the determination of available resources necessary for program implementation (including the specification of needed procedures, materials, facilities, and equipment)
3. Process evaluation, which is concerned with assessing whether or not program goals and objectives are being met and which is essentially a program monitoring process
4. Product evaluation, which is a process whereby program goals are measured and achievement levels are reported to various groups (pp. 215-238).

Evaluation is used as both a planning and a decision-making device. It is used to determine the need for new programs and for the evaluation of old programs, and as a mechanism to construct effective learning strategies.

Instructional Planning. This process includes the activities necessary to formulate the general and specific goals that will represent the purpose of a program. It also includes creation of a plan of action for achieving program goals. The terminal values selected in this stage will guide further, more detailed planning of the program and will be used as criteria by which to judge the final outcomes of the program (Whirtner and Antin 1972, pp. 19-20).

Program Development. This involves the elaboration of the general goals and plan of action into a detailed plan. It includes the specification of staffing, operations, support services and materials to be used in the basic skills program.

Instructional Methods. These are the activities or models used by a teacher to achieve the program goal(s). The teacher employs one or more instructional methods to enhance the students' acquisition of basic skills or to increase their skill levels. Teaching activities are narrow, single-purpose experiences used by a teacher to enhance the learning process. Teaching models are comprehensive, systematic approaches employed by the teacher to solve students' performance problems or to increase their skill levels.

Integrated Program. An integrated program is one in which the basic skills, as defined by P.L. 95-561, Title II (reading,

mathematics, and effective communication, both oral and written), and vocational skill training are delivered simultaneously in the same setting through various instructional methods, as measured by the degree of overlap between basic skills and vocational education.

Nonintegrated Program. A nonintegrated program is one in which the basic skills and vocational skill training are delivered concurrently but in different settings through various instructional methods with little or no overlap in content areas.

Organization of the Report

Part II, which immediately follows this introduction, provides a summary of the empirical data acquired during the project and information on program planning and delivery strategies from the literature. Part II addresses the first and third objectives listed earlier. Part III is focused upon the second and third objectives, i.e., with describing how the basic skills attainment of secondary school dropouts is related to their participation in vocational education and what kinds of instructional strategies and programs are being used to affect those relationships.

PART II

BASIC SKILLS ATTAINMENT AND PARTICIPATION IN VOCATIONAL EDUCATION

Overview

As indicated in Part I, the primary purpose of the Basic Skills project was to increase our knowledge and understanding of the relationship between secondary students' basic skills attainment and their participation in vocational education. In order to achieve this goal, two different data collection strategies were used. The first was to conduct an extensive review of the literature on the relationship between basic skills and vocational education. Particular emphasis was placed upon the identification of studies that (a) included empirical data that addressed the indicated relationship, (b) provided insights and described specific techniques for incorporating or improving basic skills instruction in vocational education, or (c) both of the above. The second strategy was to obtain and analyze extant data bases that could yield additional insights into the relationship between basic skills and vocational education. In most cases, the data supplemented the results presented in the literature and decreased the incidence of findings that were equivocal because of insufficient information.

The empirical data gleaned from the reviewed studies as well as those obtained from the selected data bases were used to address the initial project objective and its related concerns or issues as follows:

1. To describe, from a national perspective, the basic skills proficiencies of secondary-level vocational students.
2. To compare the basic skills attainment of secondary vocational students with that of students who are enrolled in other high school curricula (the general and academic curricula).
3. To describe how participation in vocational education effects change in vocational students' basic skills levels.
4. To increase our understanding of the relationship among students' basic skills, their participation in vocational education, and various vocational outcomes such as employment, earnings, and participation in further vocational training.

Although the empirical results related to the preceding issues were crucial to the completion of the project, their usefulness to educational planners, instructional developers, and other educational practitioners is limited. The empirical evidence describes what actually exists in regard to vocational students' basic skills attainment, but it yields few, if any, insights into what is currently being done or what could be done to change or perhaps to improve what exists. To provide some insights, the literature review included the identification and description of specific techniques for incorporating or improving basic skills instruction in vocational education. The resulting information should not only increase our understanding of the

relationship between participation in vocational education and basic skills attainment, but should also serve as a source of useful ideas and program improvement strategies for educators.

Organizationally, the materials presented in the remainder of this chapter reflect the two preceding themes. First, the empirical results obtained from the reviewed studies and extant data bases are described. Then, a summary of the various programmatic strategies for improving vocational students' basic skills cited in the literature is presented. Finally, the major results and findings from these two emphases are integrated into a set of specific conclusions and recommendations.

Selected Empirical Results Regarding the Basic Skills of Secondary Vocational Students

As noted previously, the empirical results were obtained from two major sources--studies cited in the research literature and data sets obtained from cooperating LEAs and national organizations. During the literature review, twelve studies were identified that yielded quantitative data and results that addressed one or more of the four general concerns or issues listed in the previous section. The results of those studies were supplemented by the results of the analyses of extant data sets--four national and sixteen LEA data sets. In the materials that follow, the specific results yielded by these two sources are organized according to the four concerns and issues related to the first project objective.

Issue One. In relation to this issue the major question posed was, "At what levels are vocational students functioning in

the basic skills both before and after their training?" Ancillary questions were, "Are the basic skills performance levels exhibited by vocational students comparable across different program (service) areas?" and "Are the performance levels of vocational students comparable across different basic skills (i.e., reading, math, and so forth)?" The results of the studies that deal with these questions are summarized in table 2, while those from the extant data sets are presented in table 3.

The information presented in tables 2 and 3 suggests the following:

- Generally speaking, the available data indicate that on standardized measures of basic skills, secondary vocational students are (on the average) performing somewhere between the thirty-fifth and fortieth percentiles which tends to be slightly more than one half a deviation unit below the average of all secondary students. Using currently available decision rules, this discrepancy in average performance would be both statistically and "educationally" significant.

  In interpreting such a conclusion, a degree of caution needs to be exercised. For one thing, the basic limitations of the data upon which this conclusion is based need to be considered and their potential implications assessed. Also, it must be remembered that this conclusion deals with the average performance of vocational students, not the performance of individual students, which would be distributed both above and below this indicated average.

TABLE 2*

A Description of the Basic Skills Levels of Vocational Education Students — Derived from Published Research Studies

Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics	Related Standards	Summary Interpretation
Trent, E. R. (1981)	Intact classes of 12th graders in 55 randomly selected districts in Ohio. Students were given achievement and ability tests in November 1980 with achievement testing occurring again in April–May 1981.	CAT-C • Reading Comp • Total Language • Total Math • OLSAT	*Means:* BOE: 618, 631, 605, 98 TI: 598, 585, 587, 96 Other Voc.: 602, 591, 580, 94 Voc.: 606, 601, 591, 96 All the F-tests showed significant differences (.001 or beyond) in performance due to group. Follow-up (Scheffe) showed significant differences at .05 level or beyond for — BOE and TI on all tests — BOE and Other Voc. for Language, Math, and OLSAT — TI and Other Voc. for Math and OLSAT	*National PRs:* BOE: 48, 53, 43, 45 TI: 39, 32, 35, 41 Other Voc.: 40, 35, 32, 35 Voc.: 42, 39, 37, 40	These results suggest that (1) on each of the basic skills criteria noted, the statewide sample of students scored below average by about 10 percentile points (i.e., they scored at approximately the 40th percentile) and (2) there were substantial differences between the scores of the various subsamples, i.e., the BOE students scored higher than the TI and Other Voc. students on all the criteria, while the TI students scored higher than the Other Voc. students on the Math and OLSAT criteria, but lower than the Other Voc. students on the reading and language criteria.
Evans, R. N. and Galloway, J. D. (1973)	A random selection of 9th graders throughout the nation (Project TALENT) were tested as 9th graders in 1960 and as 12th graders in 1963.	General Academic Aptitude Composite (Project TALENT test battery)	*Percent Above Median:* Sex: M, F 9th Graders: 27%, 37% 12th Graders: 24%, 36%	(Already provided in previous column.)	The results observed for this national sample of vocational students suggests that (a) a substantial number (about 2/3 of the overall sample) scored below the 50th percentile on the designated basic skills criterion, (b) females scored somewhat higher than males, and (c) scores decreased slightly between the initial and follow-up test administrations.
Ludeman, I. and Schneiderhan, R. M. (1976)	A random sample of 17-year-olds attending Minnesota public and nonpublic schools.	MEAP (Minnesota Education Assessment Program) • Math	$\bar{X}$% Correct — Math Perf. Area / Overall* Agri. Bus. 49.7 D. E. 48.7 Bus. 53.5 Tech. 55.6 Health 53.0 T & I 51.9 Home Ec. 49.8 *calculated from data	Statewide $\bar{X}$% = 53.0%	The results presented suggest (1) the average performance on the selected math criterion of the statewide sample of vocational students was slightly above the overall state average, and (2) there was considerable variation among the average scores of students in different vocational program areas.

*See end of Table 2 for an explanation of acronyms used to designate instruments referred to in this document.

TABLE 2 (continued)

Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics	Related Standards	Summary Interpretation
Hilton, T. L. (1971)	The 17 communities throughout the nation which participated in the Growth Studies were used. Testing of 9th graders occurred in September–October 1965.	• Math STEP • Reading STEP • Writing STEP • Listening STEP	<table><tr><th></th><th>Voc.</th><th>Agr.</th><th>Bus.</th><th>Home Ec.</th></tr><tr><td>$\bar{X}$</td><td>264</td><td>266</td><td>261</td><td>254</td></tr><tr><td>SD</td><td>11.8</td><td>10.7</td><td>12.4</td><td>12.66</td></tr><tr><td>$\bar{X}$</td><td>271</td><td>269</td><td>277</td><td>266</td></tr><tr><td>SD</td><td>16.6</td><td>14.9</td><td>15.4</td><td>18.0</td></tr><tr><td>$\bar{X}$</td><td>268</td><td>266</td><td>272</td><td>263</td></tr><tr><td>SD</td><td>17.0</td><td>15.4</td><td>15.7</td><td>13.5</td></tr><tr><td>$\bar{X}$</td><td>278</td><td>276</td><td>278</td><td>271</td></tr><tr><td>SD</td><td>12.8</td><td>11.0</td><td>12.1</td><td>10.5</td></tr></table>	*School Norms: Percentile Ranks* <table><tr><th>Voc.</th><th>Agr.</th><th>Bus.</th><th>Home Ec.</th></tr><tr><td>48</td><td>66</td><td>19</td><td>4</td></tr><tr><td>15</td><td>13</td><td>48</td><td>10</td></tr><tr><td>20</td><td>15</td><td>41</td><td>11</td></tr><tr><td>41</td><td>36</td><td>41</td><td>28</td></tr></table> (Note: Listening norms from Individual score norms)	These results suggest that (1) the sample of vocational students scored well below the average for the normative sample (on the average they scored at about the 30th percentile), (2) considerable variability was exhibited across basic skills areas, and (3) there was considerable variation in basic skills levels exhibited across students in different vocational program areas.
Creech, F. R. (1974)	Seniors from 1,044 randomly selected public and nonpublic schools tested during 1971–72. (NLS data)	Student Test Battery (STB) • Vocabulary • Picture Number • Reading • Math	*Approximate Medians:* <table><tr><th>Voc.</th><th>All Students</th></tr><tr><td>47</td><td>50.3</td></tr><tr><td>48</td><td>50.0</td></tr><tr><td>47</td><td>50.3</td></tr><tr><td>46</td><td>50.3</td></tr></table>	*Percentile Ranks:* <table><tr><th>Test Scores:</th><th>55</th><th>45</th></tr><tr><td></td><td>82</td><td>42</td></tr><tr><td></td><td>75</td><td>37</td></tr><tr><td></td><td>82</td><td>42</td></tr><tr><td></td><td>85</td><td>47</td></tr></table>	These results suggest that the subsample of vocational students scored below the medians (and averages) for the total sample (by about 1/3 of a standard deviation unit) on all of the designated basic skills criteria.
Echternacht, G. (1975)	Seniors from 1,044 randomly selected public and nonpublic schools tested during 1971–72. (NLS data)	Student Test Battery (STB) • Vocabulary • Reading • Picture Number • Ma	<table><tr><th>$\bar{X}$</th><th>SD</th></tr><tr><td>0.41</td><td>0.73</td></tr><tr><td>0.44</td><td>0.83</td></tr><tr><td>0.25</td><td>0.99</td></tr><tr><td>0.54</td><td>0.68</td></tr></table>	$\bar{X} = 0$ SD = 1 for total sample	These results suggest that (1) the vocational students scored below the averages of the total sample on all of the cited basic skills measures (overall about .4 of a standard deviation), and (2) the deficits they exhibited varied somewhat across basic skills areas.
Massachusetts Assessment of Basic Skills 1978–79 (1979)	A representative sample of 55 Massachusetts public schools. The students who were in grade 12 were tested in March–April 1979.	• Math • Reading • Writing—Item 1 —Item 2	<table><tr><th></th><th>Voc.</th><th>Bus.</th></tr><tr><td>P-Value</td><td>78.7</td><td>76.7</td></tr><tr><td>Group Effect</td><td>4.79*</td><td>7.11*</td></tr><tr><td>P-Value</td><td>80.9</td><td>82.6</td></tr><tr><td>Group Effect</td><td>5.35*</td><td>3.65*</td></tr><tr><td>$\bar{X}$</td><td>4.4</td><td>5.3</td></tr><tr><td>$\bar{X}$</td><td>4.1</td><td>5.0</td></tr></table> where *: significant for $p < .05$	*Statewide:* <table><tr><th></th><th>Average</th><th>SE of P-Value</th></tr><tr><td>Math</td><td>83.9</td><td>0.66</td></tr><tr><td>Reading</td><td>86.3</td><td>0.50</td></tr><tr><td>Writing</td><td></td><td></td></tr><tr><td>Item 1</td><td>5.2</td><td>–</td></tr><tr><td>Item 2</td><td>5.3</td><td>–</td></tr></table>	The results presented suggest that (1) the overall sample of vocational students scored well below the statewide average on all of the basic skills measures used, (2) they scored very poorly on both the mathematics and reading tests, but their performance on the writing measures varied by program area, and (3) the vocational students scored considerably below the state average on the writing test, while the business students scored near that value.

TABLE 2 (continued)

Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics	Related Standards	Summary Interpretation
Brantner, S. T. and Enderlein, T. E. (1972)	The ninth-grade students of Altoona, Pa. were tested during Spring 1969.		*Vocational* (N=191)		These results suggest that (1) the students scored at or slightly below the normative averages on the different basic skills measures, and (2) their performance on the numerical/nonverbal criteria was slightly higher than their performance on the verbal, basic skills indicants.
			$\bar{X}$ / *SD*	*Percentile Ranks:*	
		• Verbal (GATB)	92.0 / 9.4	48	
		• Numerical (GATB)	95.3 / 11.8	55	
		• Verbal (APT)	37.5 / 22.2	–	
		• Nonverbal (APT)	49.2 / 27.4	–	
Freas, A. (1978)	Eleventh-graders at two area vocational schools in Pennsylvania were tested at the beginning and end of the academic year.			*National Norms (PR):*	These results suggest that the vocational students' reading and vocabulary scores were very low and showed little variation between groups with regard to the National Norms.
		GMRT	**AB AM C MS W Overall*	*AB AM C MS W Overall*	
		• Vocabulary	9.0 8.8 9.9 9.2 9.6 9.2	2 2 3 2 2.5 2	
		• Reading Comprehension	6.9 7.3 8.9 7.8 7.9 7.7	– – 1 – – –	
			(A significant difference between groups for Reading Comprehension on the pretest was reported, but follow-up tests using Scheffe showed no significant differences between groups at the .05 level.)		* The program areas indicated are: – AB or Auto Body, – AM or Auto Mechanics, – C or Cosmetology, – MS or Machine Shop, and – W or Welding

Acronyms Used to Designate Instruments Referred to in This Report:

- California Achievement Tests –CAT
- Otis Lennon School Ability Test – OLSAT
- Sequential Tests of Educational Progress – STEP
- General Aptitude Test Battery – BATB
- Academic Promise Test – APT
- Gates-MacGinitie Reading Test – GMRT
- Stanford Achievement Tests – SAT
- Wide Range Achievement Test – WRAT
- Wechler Adult Intelligence Scale – WAIS
- Differential Aptitude Test – DAT
- Fundamental Achievement Series – FAS
- California Test of Mental Maturity – CTMM
- School and College Ability Tests – SCAT
- California Test of Basic Skills – CTBS
- Science Research Associates Survival Skills Tests – SRA

TABLE 3

A Description of the Basic Skills Levels of Vocational Students Derived from the Analysis of a Sample of Extant Data Bases

Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Eastern Wisconsin — a sample of 133 students		Groups:	(Indicated scores are expressed in percentiles.)	The results presented in this data base suggest that (1) overall these vocational students exhibit lower than average basic skills scores (i.e., at about the 25th percentile), (2) business students scored substantially higher than the other vocational students (i.e., about 20 percentile points higher), and (3) performance appeared slightly higher in math than in reading (i.e., about 8 percentile points).
	• Reading	Grade: Voc. / Business / Undec./Voc.		
		9th: 23.7 / 48.3 / 26.1		
		11th: 24.6 / 43.4 / 25.3		
	• Math	9th: 33.7 / 49.2 / 37.9		
		11th: — / — / —		
Eastern Connecticut — a sample of 21 students		Groups:	(Indicated scores are expressed in percentiles.)	These results suggest that (1) the students' basic skills attainments are below average (i.e., near the 35th percentile), (2) the business students' basic skills are higher than those of the other "vocational" students (i.e., about 20 percentile points higher), and (3) performance levels across both basic skills areas tested are about the same (i.e., near the 35th percentile).
	• Reading	Grade: Vocational / Business		
		9th: 21.9 / 43.3		
		11th: 22.4 / 42.9		
	• English	9th: 26.3 / 44.4		
		11th: 21.8 / 40.8		
Central California — a sample of 95 students		Groups:	(Indicated scores are expressed in percentiles.)	These data suggest (1) the basic skills attainments of vocational students in this district are slightly above average (i.e., at about the 52nd or 53rd percentile), (2) the students in Office Education, Home Economics, and Vocational Undecided scored slightly higher (about 55th percentile) than the Agriculture students (52nd percentile) and the T&I students (48th percentile), and (3) the students' performance in the vocabulary and comprehension areas (55th percentile) were slightly higher than their performance in either the language (52nd percentile) or math areas (50th percentile).
		Grade: T&I / Office Ed. / Agr. / Home Ec. / Voc. Undec.		
	• Vocabulary	9th: 49 / 52 / 56 / 52 / 57		
		10th: 54 / 64 / 60 / 60 / 50		
		11th: 47 / 56 / 53 / 55 / 53		
		12th: 50 / 59 / 58 / 64 / 60		
	• Comprehension	9th: 47 / 56 / 55 / 59 / 56		
		10th: 50 / 60 / 55 / 62 / 48		
		11th: 43 / 54 / 46 / 64 / 47		
		12th: 48 / 60 / 50 / 69 / 62		
	• Language	9th: 45 / 59 / 51 / 49 / 57		
		10th: 47 / 60 / 53 / 60 / 48		
		11th: 43 / 50 / 47 / 50 / 43		
		12th: 47 / 66 / 49 / 55 / 60		
	• Math	9th: 49 / 55 / 50 / 46 / 55		
		10th: 52 / 53 / 50 / 43 / 50		
		11th: 52 / 44 / 47 / 33 / 45		
		12th: 52 / 47 / 50 / 54 / 63		

TABLE 3 (continued)

Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Central California – a sample of 76 students		Groups:	(Indicated scores are expressed in percentiles.)	The data secured from this site suggests that (1) the students' basic skills attainments are below average (i.e., they are at about the 40th percentile), (2) the performance of students in different service areas varied (i.e., from the 49th percentile for Agriculture students, to the 40th percentile for Business and T&I students, to the 31st percentile for Home Ec. students), and (3) the performance levels across basic skills areas were quite different (ranging from a high for math–65th percentile–to a low for vocabulary–24th percentile).
		Grade / T&I / Business / Agr. / Home Ec.		
	• Vocabulary	8th 23.5 24.7 30.0 19.5		
		11th 23.7 23.0 27.0 14.0		
	• Comprehension	8th 26.3 29.0 31.0 18.5		
		11th 24.0 26.5 39.0 24.0		
	• Language	8th 31.7 36.3 56.0 26.5		
		11th 49.7 57.9 38.0 41.5		
	• Math	8th 62.8 66.6 83.0 47.5		
		11th 58.5 58.0 85.0 57.5		
Western North Carolina – a total sample of 199 students		Groups:	(Indicated scores are expressed in percentiles.)	These data suggest that (1) the sampled students, when in the 9th grade, performed at an average level (i.e., at the 50th percentile), but that when they were in the 11th grade their averages were somewhat below the scores deemed as "passing", (2) there was considerable variation in performance levels across service areas (at 9th grade the Business and D.E. students scored higher than the T&I students, who scored higher than the Home Ec. students), and (3) the students' performance levels across basic skills areas were comparable.
		Grade / Agr. / Business / D.E. / Home Ec. / T&I		
	• Reading (Test 1)	9th 45.3 48.1 60.0 20.8 43.2		
	(Test 2)	– 53.2 88.0 53.0 31.6		
	(Test 3)	– – – – 31.6		
	• Math (Test 1)	9th 57.7 55.4 59.5 23.8 41.2		
	(Test 2)	– 56.5 78.0 57.3 60.2		
	(Test 3)	– – – – 21.3		
	• Reading* (Test 4)	11th 65.3 74.1 115.0 70.8 77.9	Min. pass. score = 87	
	• Math* (Test 4)	11th 65.5 69.7 107.3 57.8 72.0	Min. pass. score = 77	
	*Minimum Competency Tests (State)			
Southern Louisiana – a sample of 617 students		Groups:*	(Indicated scores are expressed in percentiles.)	These data indicate that (1) the designated sample of vocational students was performing well below average (i.e., at around the 23rd percentile) on the selected basic skills criteria, (2) the performance levels of students in different service areas varied considerably, with those in the areas of Bus., Tech., and COOP Bus. scoring highest (near the 32nd percentile), while those in the other service areas scored near the 17th percentile, and (3) reading performance (19th percentile) was lower than language and math performance (both at about the 25th percentile).
		Grade / a / b / c / d / e / f / g		
	• Reading			
	(Test 1–form Y)	9th 17 17 12 20 32 16 30		
	(Test 1–form X)	10th 8 11 9 18 26 11 27		
	(Test 2)	11th 10 19 11 22 35 13 34		
	(Test 2)	12th 11 15 14 23 33 16 24		
	• Language			
	(Test 1–form Y)	9th 16 15 25 32 31 20 45	*The indicated programs are–	
	(Test 1–form X)	10th 13 15 23 27 30 15 39		
	(Test 2)	11th 14 20 19 30 33 15 45	a – Agriculture	
	(Test 2)	12th 12 15 20 27 32 15 28	b – Health Occupations	
	• Math		c – Home Economics	
	(Test 1–form Y)	9th 23 20 20 28 33 19 35	d – Business	
	(Test 1–form X)	10th 21 22 19 24 33 20 29	e – Technical	
	(Test 2)	11th 18 20 17 30 45 23 41	f – Trade and Industry	
	(Test 2)	12th 16 17 16 28 50 21 42	f – COOP/Business	

TABLE 3 (continued)

Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Southeastern Kansas – a total sample of 214 students	• Reading • Math	*TIME* / *Group (Only Students in Remedial Reading)* Pre: 8.3 Post: 9.9 *(10% Sample of All Students in School* Pre: 25.6	(Indicated scores are expressed as grade equivalents.) (Indicated score is expressed as percentile.)	These data suggest that the reading performance of the *remedial* students was well below grade level and that the overall math performance of students in the school was below average (26th percentile).
Eastern Wisconsin – a sample of 119 students	• Math	*TIME* / *Groups:* Vocational / Business Pre: 10.0 / 10.4 Post: 10.3 / 10.5	(Indicated scores are expressed as grade equivalents.)	The results observed via this data base suggest that (1) the sampled students are performing somewhat below grade level on the indicated basic skills criteria, and (2) the business students are performing slightly higher than the "vocational" students.
Southeastern Ohio – a total sample of 304 students (67,200, and 37, respectively, per criterion)	• Reading • Math • Writing	*Groups:* Ag. / D.E. / Health Occ. / Home Ec. / Bus./Off. / Tech. / T&I Reading: – / – / 97 / 76 / 87 / 92 / 80 Math: 75 / 60 / 65 / 44 / 64 / 65 / 65 Writing: – / – / – / 68 / 60 / 52 / 45	(Indicated scores are expressed as percentages of criterion items mastered.)	The data secured from this site suggest (1) the vocational students are functioning at about a 68% level of mastery on the designated criteria, (2) the health, business and office, agriculture, and tech. students' performance levels are higher than those of the D.E., Home Ec., and T&I students, and (3) reading performance is higher than either math or writing performance.
Eastern South Dakota – a total of 334 students (11th and 12th graders)	• Reading (Test 1) (Test 2) (Test 1) (Test 2) • Math (Test 1) (Test 2) (Test 1) (Test 2) • Verbal (Test 3) • Numerical (Test 3)	*Groups:* Grade / Agr. / Bus. / Health / Tech. / T&I 9th: 39 / 45 / 43 / 69 / 84 9th (Test 2): – / 38 / 49 / 35 / 46 11th (Test 1): 45 / 49 / 41 / 60 / 36 11th (Test 2): 21 / 38 / 44 / 52 / 30 9th (Test 1): 42 / 42 / 37 / 53 / 41 9th (Test 2): – / 38 / 39 / 67 / 49 11th (Test 1): 37 / 50 / 36 / 54 / 41 11th (Test 2): 26 / 31 / 53 / 53 / 37 Pre (Verbal): 100 / 97 / 94 / 100 / 94 Post (Numerical): 97 / 105 / 93 / 106 / 99	(Indicated scores are expressed in percentiles.) (Indicated scores are expressed as raw scores with means and standard deviation of 102 and 14, and 106 and 15, respectively.)	These data suggest that (1) the sampled vocational students were performing slightly below average on the various criteria (i.e., near the 43rd percentile), (2) the performance levels of the Agr. and Tech. students (53rd percentile) were higher than those of the Bus., Health, and T&I students (41st percentile), and (3) the performance levels exhibited for reading/verbal and math/numerical were similar in magnitude.

TABLE 3 (continued)

Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
A sample of 5,213 seniors who were included in the "NLS Study of the Class of 72" and designated as vocational students	• Vocabulary • Reading • Math	*Groups:* *Agr.* / *Bus.* / *D.E.* / *Health* / *Home Ec.* / *T&I* Vocabulary: 3.8 / 4.9 / 3.9 / 4.7 / 2.9 / 3.8 Reading: 6.2 / 8.0 / 6.7 / 7.4 / 5.1 / 6.3 Math: 8.5 / 8.7 / 7.7 / 7.4 / 5.0 / 8.5	Overall mean = 6.0 and standard deviation = 4.2 Overall mean = 9.3 and standard deviation = 5.1 Overall mean = 12.3 and standard deviation = 6.2	The results obtained from this data base suggest that (1) the sampled students scored about six-tenths of a standard deviation unit below average on the various basic skills indicants, (2) the performance levels of the Bus. and T&I students were higher than those of the Agr., D.E., and Health students, which in turn were higher than those of the Home Ec. students, and (3) the students' math performance was slightly lower than their vocabulary and reading performance.
Northeastern Florida — a sample of 1,131 senior vocational students	• Reading • Math	*Groups:** *Grade* / *a* / *b* / *c* / *d* / *e* / *f* / *g* Reading 11th: 37 / 46 / 43 / 43 / 29 / 38 / 48 Reading 12th: 35 / 44 / 39 / 37 / 27 / 36 / 44 Math 11th: 44 / 51 / 49 / 45 / 37 / 45 / 51 Math 12th: 44 / 57 / 54 / 50 / 39 / 48 / 54 *The program areas indicated are: a — Agriculture b — Business and Office c — Distributive Education d — Health Occupations e — Home Economics f — Trade and Industrial g — Other (Vocational)	(Indicated scores are expressed in percentiles.)	These results suggest that (1) the indicated students' basic skills levels are below average (i.e., at about the 43rd percentile), (2) they vary considerably across service areas (i.e., Bus. and Office students scored higher than the Agr., D.E., Health, and T&I students, who scored higher than the Home Ec. students), and (3) the students' math performance was considerably higher (i.e., by about 10 percentile points) than their reading performance.
Northwestern Oregon — a sample of 1,900 students, 1,040 of whom were seniors in 1979–80 and 860 of whom were seniors in 1980–81	• Math	*Groups:* *Grade* / *79–80 Students* / *80–81 Students* 9th: 50.9 / 55.1 11th: 48.1 / 50.6 12th: 46.6 / 49.2	(Indicated scores are expressed in standard score form with a mean of 50 and standard deviation of 10.)	These results suggest that the sampled vocational students are performing at or a little below average on the math criteria employed by this site.

TABLE 3 (continued)

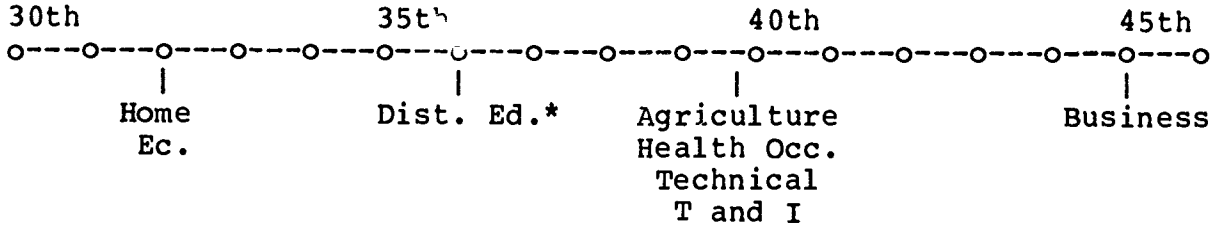
Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
The "Vocational Student" subsample from the 10% sample that completed the ACT during the 1978–79 and 1979–80 school years; n = 28,468	• English • Math	*Groups:* *YEAR* — *Bus./Comm.* — *Voc./Occ.* 11th: 16.8 — 16.1 12th: 15.6 — 14.3 Grad. (HS): 13.8 — 13.0 11th: 15.3 — 15.2 12th: 13.1 — 12.6 Grad. (HS): 10.8 — 10.9	(Indicated scores are expressed as standard scores with a mean and standard deviation of 17.9 and 5.4, and 17.4 and 7.6, respectively.)	The results obtained via this data base suggest that (1) the sampled students scored below average (by about ½ standard deviation unit) on both basic skills measures, (2) the Bus./Comm. students scored slightly higher than the Voc./Occ. students, and (3) the students' performance on the English criterion was higher than that on the math criterion.
National sample of 26,053 sophomores and 23,147 seniors from the "High School and Beyond Study"	• Vocabulary • Reading • Math • Vocabulary • Reading • Math	*Groups:** *Grade* — *a* — *b* — *c* — *d* — *e* — *f* — *g* 10th: 43 45 44 43 41 43 44 43 45 44 43 42 46 44 44 44 45 43 40 47 44 12th: 46 49 47 47 44 50 47 47 49 47 48 44 50 47 45 47 46 45 42 50 46 *The indicated programs are: a — Agriculture b — Business c — Distributive Education d — Health Occupations e — Home Ecnnomics f — Technical g — Trade and Industry	(Indicated scores are expressed in standard score form with a mean of 50 and a standard deviation of 10.)	The results obtained via this data base suggest that (1) the sampled students' performance levels on the indicated criteria were about ½ of a standard deviation unit below average, (2) the performance levels of the Tech. and Bus. students were higher than those of the Agr., D.E., Health, and T&I students, which in turn were higher than those of the Home Ec. students, and (3) performance across basic skills areas was comparable.
National sample of 17-year-olds identified as part of the National Assessment of Educational Progress—Supplemental Math data set	• Math (Test 1) • Math (Test 2)	*Groups:* *Grade* — *Ag.* — *Bus.* — *D.E.* — *Health Occ.* — *Home Ec.* — *T&I* 10/less: 21 19 19 18 14 20 11th: 28 26 25 23 20 28 12th: 25 29 23 28 30 28 10/less: 21 18 20 12 14 20 11th: 25 25 24 22 19 25 12th: 32 25 20 26 22 29	(Indicated scores are expressed in raw score form—the overall mean = 28.1 and standard deviation = 8.2.) (Indicated scores are expressed in raw score form—the overall mean = 26.7 and standard deviation = 6.2.)	The results yielded by this data base suggest that (1) the math performance levels of the sampled students was about ¾ of a standard deviation unit below average and (2) the performance levels exhibited by Agr., Bus., and T&I students were higher than those exhibited by the D.E., Home Ec., and Health students.

TABLE 3 (continued)

Site/Sample	Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Central Texas – a sample of 1,751 vocational students who were seniors during the 78–79, 79–80, and 80–81 school years	• Reading • English • Math–Computation • Math–Concepts	*Grades:* 9th / 10th / 11th / 12th 39.8 / 40.3 / 39.7 / 86.1 34.7 / 35.5 / 34.9 / 32.8 39.4 / 43.5 / 43.4 / 37.9 42.6 / 45.4 / 45.7 / 42.1	(Indicated scores are expressed as percentiles.)	These results suggest that the sampled students are functioning below average on the designated basic skills criteria (i.e., about 8 to 10 percentile points below average).
Southeastern Pennsylvania – a sample of 1,875 vocational students who were tested between the 77–78 and 80–81 school years	• Reading • Math • Language	*Means* *Grades:* 8th / 9th / 10th / 11th / 12th 37 / 40 / 44 / 41 / 28 30 / – / – / 24 / 12 35 / – / – / – / –	(Indicated scores are expressed as percentiles.)	These results suggest that the designated sample of vocational students is functioning well below average in terms of their basic skills attainments.

- Overall, secondary vocational students' basic skills attainment tends to be about the same when they exit training programs as when they enter them, i.e., betweeen the thirty-fifth and fortieth percentiles.
- The basic skills attainment of secondary vocational students appears to vary systematically by program or service area in which they are enrolled. Performance across the seven major program areas might be depicted as follows:

PERFORMANCE (in percentiles)



*Note: This estimate is based upon two studies only and could fluctuate considerably.

- The vocational students' levels of performance across basic skills areas do not appear to vary systematically and overall are quite similar in magnitude, (i.e., most of them tend to be within the thirty-fifth to fortieth percentile range). The only exception noted was in the area of mathematics, where performance was at about the forty-third percentile.
- Very few data exist regarding vocational students' performance in basic skills areas other than mathematics and reading. Additional research into the areas of listening, writing, and language usage should be conducted.

Issue Two. In examining this issue, the principal question was, "How do the basic skills levels of vocational education students compare with the basic skills levels of nonvocational students?" Another question related to this issue was, "How do the basic skills levels of students in different vocational program areas compare with the basic skills levels of nonvocational students?" Table 4 provides an overview of the results of studies regarding these questions, and table 5 provides parallel findings gleaned from analyses of thirteen related data bases.

The results summarized in tables 4 and 5 suggest that:

- The basic skills attainment of secondary vocational students is typically (a) significantly lower than the comparable attainment of academic or college preparatory students and (b) about the same as the basic skills attainment of general track students. In relation to the initial question posed, it should be noted that the observed results are equivocal. That is, in some instances when data on general and academic students are combined, their performance is higher than that of the vocational students, while in other instances it is lower or does not differ from the performance of the vocational students.
- There was significant variability in performance levels among the various vocational program areas. In no instance, however, did the performance of vocational students in those program areas approximate that of academic students. In the limited number of cases where data

TABLE 4

Comparisons of the Basic Skills Level of Vocational Students and Nonvocational Students — Summarized in Published Literature

Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics a) Descriptive	Statistics b) Inferential	Summary Interpretation(s)
Ludeman, I. and Schneiderhan, R. M. (1976)	A random sample of 17-year-olds attending Minnesota public and nonpublic schools.	MEAP (Minnesota Education Assessment Program) • Math	*Years in Voc/Tech Courses* / *Math Perf. $\bar{X}$% Correct* None — 52.3 ½–1 — 53.3 1½–2 — 53.9 2½–3 — 53.6	Statewide $\bar{X}$% = 53.0%	The results indicate that the total mathematics performance for vocational and nonvocational students do not appear to differ significantly; however, the nonvocational students were the lowest.
Trent, E. R. (1981)	Intact classes of 12th graders in 55 randomly selected districts in Ohio. Students were given achievement and ability tests in November 1980, with achievement testing occurring again in April–May 1981.	CAT–C: • Reading Comp • Total Language • Total Math • OLSAT	*BOE* / *TI* / *Other Voc.* / *Voc.* / *Non Voc.* 618 / 598 / 602 / 606 / 640 631 / 585 / 591 / 601 / 639 605 / 587 / 580 / 591 / 631 98 / 96 / 94 / 96 / 103	Follow-up using F-tests and PRs showed significant difference at the .001 level between vocational and nonvocational students on all tests.	The results indicate that the nonvocational students scored considerably higher than the vocational students on all criterion measures (about ½ of a standard deviation).
Evans, R. N. and Galloway, J. D. (1973)	A random selection of 9th graders throughout the nation (Project TALENT) were tested as 9th graders in 1960 and as 12th graders in 1963.	General Academic Aptitude Composite (Project TALENT test battery)	*Curriculum* / *Percentage above Median 9th* / *12th* Voc. M — 27 — 24 Voc. F — 37 — 36 Coll. M — 77 — 79 Coll. F — 74 — 79 Gen. M — 39 — 36 Gen. F — 41 — 40	(No tests, per se, were conducted.)	The results suggest that (1) the percentage of nonvocational students scoring above the median on the test was about twice that of the other areas (vocational and general), and (2) the percentage of general students scoring above the median was only slightly higher than the percentage of vocational students.
Patton, M. J. from Hilton (19?1)	A subsample of the Growth Study data was used—tested as 7th graders in 1961 with follow-ups as 9th and 11th graders.	• Math STEP • Reading STEP • Listening STEP • Writing STEP		Significant multivariate Fs ($p < .001$) were reported for the curriculum groups for grades 7, 9, and 11 with significant univariate Fs for all tests at the .001 level.	The results reported in this study suggest that (1) at the beginning of grade 7 the students who later enrolled in academic programs are distinguishable from those students who later enroll in nonacademic programs with regard to overall achievement, and (2) for grades 9 and 11, again the academic students are distinguishable from the nonacademic on the four criterion measures used.

TABLE 4 (continued)

<table>
<tr><th>Source</th><th>Sample Location Point(s) of Measurement</th><th>Skill(s)</th><th colspan="2">Statistics
a) Descriptive / b) Inferential</th><th>Summary Interpretation(s)</th></tr>
<tr><td>Hilton, T. L. (1981)

ANOVA and Scheffe calculated from reported data</td><td>The 17 communities throughout the nation which participated in the Growth Study were used. Ninth graders were tested in September–October 1965 with follow-up as 11th graders.</td><td>• Math STEP
• Reading STEP
• Writing STEP
• Listening STEP</td><td colspan="2">$\bar{X}$s
<table><tr><th></th><th colspan="2">Math</th><th colspan="2">Writing</th><th colspan="2">Listening</th><th colspan="2">Reading</th></tr><tr><th>Curric.</th><th>9th</th><th>11th</th><th>9th</th><th>11th</th><th>9th</th><th>11th</th><th>9th</th><th>11th</th></tr><tr><td>Acad.</td><td>276</td><td>282</td><td>285</td><td>296</td><td>292</td><td>297</td><td>289</td><td>301</td></tr><tr><td>Agr.</td><td>266</td><td>275</td><td>266</td><td>273</td><td>276</td><td>282</td><td>269</td><td>280</td></tr><tr><td>Bus.</td><td>261</td><td>267</td><td>272</td><td>282</td><td>278</td><td>284</td><td>277</td><td>287</td></tr><tr><td>Gen.</td><td>262</td><td>267</td><td>267</td><td>277</td><td>278</td><td>283</td><td>272</td><td>283</td></tr><tr><td>Home Ec.</td><td>254</td><td>266</td><td>263</td><td>280</td><td>271</td><td>283</td><td>266</td><td>282</td></tr><tr><td>Voc.</td><td>264</td><td>269</td><td>268</td><td>276</td><td>278</td><td>284</td><td>271</td><td>281</td></tr></table>(For follow-up to one-way ANOVAs: At 9th grade level: significant differences for all tests using Scheffe for Acad. with all other areas, significant differences for Gen. vs. Bus. for the Writing and Reading tests.
At 11th grade level: significant differences for all skills except Math. Using Scheffe for Acad. with all other curricula—in Math all were significant except Acad. with Agr.; significant differences for Gen. vs. Bus. for the Writing and Reading tests.)</td><td>The results reported in this study suggest that (1) the vocational students' basic skills levels for each grade level were lower than those of the academic students (about 1 standard deviation unit) on all criterion measures, (2) the general and vocational students had similar scores for each grade level on all criterion measures; however, (3) the business students scored higher than the general students on the writing and reading tests for grades 9 and 11.</td></tr>
<tr><td>Creech, F. R. (1974)</td><td>The seniors from 1,044 randomly selected public and nonpublic schools were tested during 1971–72 (NLS data).</td><td>Student Test Battery (STB)

• Vocabulary

• Picture–Number

• Reading

• Math</td><td>Percentile Ranks
Test Scores:
<table><tr><th>Curric.</th><th>65</th><th>55</th><th>45</th><th>35</th></tr><tr><td>Ac.</td><td>75</td><td>45</td><td>10</td><td>5</td></tr><tr><td>Gen.</td><td>95</td><td>77</td><td>40</td><td>10</td></tr><tr><td>V/T</td><td>95</td><td>82</td><td>42</td><td>10</td></tr><tr><td>Ac.</td><td>95</td><td>52</td><td>20</td><td>2</td></tr><tr><td>Gen.</td><td>97</td><td>75</td><td>37</td><td>5</td></tr><tr><td>V/T</td><td>97</td><td>75</td><td>37</td><td>5</td></tr><tr><td>Ac.</td><td>82</td><td>40</td><td>10</td><td>5</td></tr><tr><td>Gen.</td><td>95</td><td>75</td><td>42</td><td>10</td></tr><tr><td>V/T</td><td>95</td><td>82</td><td>42</td><td>12</td></tr><tr><td>Ac.</td><td>90</td><td>37</td><td>10</td><td>5</td></tr><tr><td>Gen.</td><td>95</td><td>80</td><td>42</td><td>10</td></tr><tr><td>V/T</td><td>95</td><td>85</td><td>47</td><td>12</td></tr></table></td><td>(No tests, per se, were conducted.)</td><td>The results suggest (1) the academic students scored appreciably higher on all the performance criteria than the students in the other curricula, (2) small differences were found between the general and vocational/technical students, and (3) the vocational/technical and general students' scores on all four criteria are about 1/3 standard deviation below those of the academic students.</td></tr>
</table>

TABLE 4 (continued)

Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics a) Descriptive	Statistics b) Inferential	Summary Interpretation(s)
Echternacht, G. (1975) NOTE: high values indicate low grades	The seniors from 1,044 randomly selected public and nonpublic schools were tested during 1971–72 (NLS data).	Student Test Battery (STB) • Vocabulary • Reading • Picture–Number • Math	$\bar{X}$s *Voc.* / *Acad.* / *Gen.* 0.41 / 0.49 / 0.37 0.44 / 0.50 / 0.37 0.25 / 0.31 / 0.25 0.54 / 0.61 / 0.45	*Group* / *Multiple R* Voc. vs. Gen. 0.33 Voc. vs. Acad. 0.70 (Note: The first discriminant function separated academic students from the remaining students and correlated highly with measures of academic ability.)	These results suggest (1) the academic students scored appreciably higher than the vocational and general students on all the basic skills measures, scoring above the averages of the total sample on all these measures (overall about 1 standard deviation above vocational and general students), and (2) the vocational and general students scored below the averages of the total sample on all the cited basic skills measures (the groups scored about .4 of a standard deviation below the overall averages).
Massachusetts Assessment of Basic Skills 1978–79 (1979)	A representative sample of 55 Massachusetts public schools' 12th grade students were tested in March–April 1979.	• Math • Reading • Writing—Item 1 —Item 2	*Gen.* / *Voc.* / *Coll.* / *Bus.* P-Value 78 / 79 / 89 / 76 Group Effect −5* / −5* / 6* / −7* P-Value 83 / 80 / 90 / 83 Group Effect −2* / −5* / 4* / −4* $\bar{X}$ 4.6 / 4.4 / 5.6 / 5.3 $\bar{X}$ 4.8 / 4.1 / 5.8 / 5.0 *$p < .05$	*Statewide* $\bar{X}$ / *Standard Error* 83.9 / 0.66 86.3 / 0.50 5.2 / – 5.3 / –	The results presented suggest that (1) the college preparatory students scored well above the statewide average while all other curriculum areas scored well below on the basic skills measures for math and reading, (2) the vocational and general students scored considerably below the state average on the writing test, while the business students scored near that value and the college preparatory students scored above the state average, and (3) the vocational and general students had similar scores on all criterion measures.

TABLE 5

Comparisons of the Basic Skills Attainments of Vocational and Non-Vocational Students Derived from the Analyses of a Sample of Extant Data Bases

Site/Sample	Skill(s)	Statistics a) Descriptive	b) Inferential	Summary Interpretation(s)
10% sample of the students who completed the ACT during the 1979-80 school year; n = 37,749	• Math • English • Comprehension	*Groups:* *Grade* — *Bus/Comm* — *Voc/Office* — *Academic* 11th 15.3 15.2 21.6 12th 13.1 12.6 18.9 Grad. 10.8 10.9 14.5 11th 16.8 16.1 20.4 12th 15.6 14.3 18.7 Grad. 13.8 13.0 15.3 11th 16.7 16.5 21.7 12th 15.0 14.5 19.7 Grad. 13.4 13.2 16.1	Multivariate F for groups = 1250.1** Multivariate F for grades = 539.3** Multivariate F for interaction = 5.8** where ** indicates that the designated tests are significant at α = .01 level	The results obtained via this data base suggest that the academic students' basic skills scores are significantly higher than those of both groups of vocational students (on all three designated criteria).
Southwestern Ohio — total sample of 836 students (67,200 and 37, respectively, for each of the designated criteria)	• Reading • Math • Writing	*Groups:* • *a* *b* *c* *d* *e* *f* *g* *h* — — 97 76 87 92 80 86 75 60 65 44 64 65 65 63 — — — 63 60 52 45 55 •The groups indicated are: a — Agriculture b — Distributive Education c — Health Occupations d — Home Economics e — Business and Office f — Technical g — Trade and Industry h — General and Academic combined	F (all groups) = 2.1• F (voc vs. non-voc) = 1.1• F (all groups) = 2.8•• F (voc vs. non-voc) = .7• F (all groups) = 1.0• F (voc vs. non-voc) = .1• where • = not significant and •• = significant at α = .01 level	The results obtained via this data base suggest that (1) generally the performance of the vocational students was comparable to that of the academic/general students sampled, and (2) the performance levels of students in different service areas varied considerably with some being higher than those of the academic/general students and some being lower.
Eastern Wisconsin — a total of 119 students		*Groups:* *Time* — *Vocational* — *Business* — *Academic & General* Pre 10.0 10.4 9.6 Post 10.3 10.5 10.0	F = 2.3• F = 2.7• where • = not significant	The results observed for this data base showed that the performance level of the vocational students were comparable to those of the academic/general students.

TABLE 5 (continued)

Site/Sample	Skill(s)	Statistics a) Descriptive	b) Inferential	Summary Interpretation(s)
Southern Louisiana — a total of 700 students		*Grade* / *Groups: Vocational* / *Non-Vocational*		The results obtained from the analysis of this data base suggest that the performance levels of the vocational students on the reading and language criteria are somewhat lower than those of the non-vocational students (but not necessarily significantly lower) and that on the math criterion the performance differential between the two groups is even less.
	• Reading			
	(Test 1—form Y)	9th: 21.2 / 25.6	F = 3.1•	
	(Test 1—form X)	10th: 17.0 / 22.4	F = 4.8••	
	(Test 2)	11th: 21.7 / 18.3	F = 1.3••	
	(Test 2)	12th: 23.9 / 27.1	F = 1.0•	
	• Language			
	(Test 1—form Y)	9th: 29.9 / 36.6	F = 5.4••	
	(Test 1—form X)	10th: 25.3 / 31.7	F = 5.1••	
	(Test 2)	11th: 27.5 / 26.0	F = 0.2•	
	(Test 2)	12th: 29.5 / 35.8	F = 3.3•	
	• Math			
	(Test 1—form Y)	9th: 26.5 / 31.6	F = 3.6•	
	(Test 1—form X)	10th: 24.6 / 28.0	F = 2.4•	
	(Test 2)	11th: 29.5 / 29.3	F = 0.0•	
	(Test 2)	12th: 29.4 / 36.4	F = 4.6•	
			where • = not significant and •• = significant at α = .05 level	
Eastern Connecticut — a total sample of 76 students		*Grade* / *Voc.* / *Bus.* / *Gen.* / *Acad.*		The results obtained via this data base suggest that (1) the academic students scored significantly higher on all three basic skills criteria than both groups of vocational students, and (2) the vocational students (both groups) scored significantly higher on all three criteria than the general students.
	• Reading	10th: 50 / 59 / 36 / 77	Multivariate F (all groups) = 7.8••	
	• Language	40 / 52 / 33 / 72		
	• Math	50 / 44 / 36 / 78		
	• Reading	12th: 40 / 49 / 27 / 69	Multivariate F (all groups) = 11.2••	
	• Language	34 / 56 / 30 / 68		
	• Math	45 / 39 / 30 / 80		
			where •• = significant at α = .001 level	
Eastern Connecticut — a total sample of 115 students		*Grade* / *Voc.* / *Bus.* / *Gen.* / *Acad.*		The results obtained via this data base suggest that (1) the basic skills levels of vocational students (both Voc. and Bus. combined) on the two designated criteria are significantly less than those of the Academic students, but greater than those of the General students, and (2) the Voc. students' basic skills levels are slightly lower than the General students', while the Bus. students' basic skills levels are significantly higher than those of the General students.
	• Reading	9th: 22 / 43 / 23 / 59	Multivariate F (all groups) = 6.4••	
	• English	26 / 44 / 29 / 60		
	• Reading	11th: 22 / 43 / 30 / 63	Multivariate F (all groups) = 8.3••	
	• English	22 / 41 / 28 / 63		
			where •• = significant at α = .001 level	

TABLE 5 (continued)

Site/Sample	Skill(s)	Statistics: a) Descriptive	b) Inferential	Summary Interpretation(s)
Central California — a total sample of 170 students		*Groups:* Grade / T&I / Office Ed. / Agr. / Home Ec. / Voc. Und. / Non-Voc.		These data suggest (1) the basic skills attainments of the Non-Voc. students (on all four criteria) are significantly greater than those of the vocational students, and (2) although considerable variability in performance was observed among the groups of vocational students, they all exhibited lower performance levels than did the Non-Voc. students.
	• Vocabulary	9th: 49 / 52 / 56 / 52 / 57 / 72	Multivariate F (all groups) = 2.3**	
	• Comprehension	47 / 56 / 55 / 59 / 56 / 70		
	• Language	45 / 59 / 51 / 49 / 57 / 71		
	• Math	49 / 55 / 50 / 46 / 55 / 68		
	• Vocabulary	10th: 54 / 64 / 60 / 59 / 50 / 78	Multivariate F (all groups) = 2.6**	
	• Comprehension	50 / 60 / 55 / 62 / 48 / 74		
	• Language	47 / 60 / 53 / 60 / 48 / 72		
	• Math	52 / 53 / 50 / 43 / 50 / 70		
	• Vocabulary	11th: 47 / 56 / 53 / 55 / 53 / 70	Multivariate F (all groups) = 3.7**	
	• Comprehension	43 / 54 / 46 / 64 / 47 / 67		
	• Language	43 / 50 / 47 / 50 / 43 / 71		
	• Math	52 / 44 / 47 / 33 / 45 / 69		
	• Vocabulary	12th: 50 / 59 / 58 / 64 / 60 / 77	Multivariate F (all groups) = 3.8**	
	• Comprehension	48 / 60 / 50 / 69 / 62 / 70		
	• Language	47 / 66 / 49 / 55 / 60 / 75		
	• Math	52 / 47 / 50 / 54 / 63 / 71		
			where ** = significant at α = .05 level	
Eastern Wisconsin — a total sample of 162 students		*Groups:* Grade / Voc. / Bus. / Voc. Und. / Gen. Acad.		These data suggest (1) the basic skills levels of the combined groups of "vocational" students (Voc., Bus., and Voc. Und.) are approximately equal to those of the Gen. and Acad. students, (2) considerable variability exists among the groups of vocational students in terms of their basic skills attainments—Bus. students scored significantly higher than the Voc. and Voc. Und. students, and (3) the Bus. students scored higher than the Acad. and Gen. students, who scored higher than the Voc. and Voc. Und. students.
	• Reading	9th: 24 / 48 / 26 / 34	Multivariate F (all groups) = 4.0** = 4.0**	
	• Math	34 / 49 / 38 / 41		
	• Reading	11th: 25 / 43 / 25 / 36	Univariate F (all groups) = 5.7**	
			where ** = significant at α = .001 level	
National sample of 26,053 sophomores and 23,147 seniors from the "High School and Beyond Study"		*Groups:* Grade / Voc. / Gen. / Acad.		The data secured from this data base suggest that the basic skills attainments of the Voc. students are significantly lower than those of the Acad. students and slightly lower than those of the Gen. students.
	• Vocabulary	10th: 44.1 / 46.8 / 52.7	Multivariate F (years) = 847.4**	
	• Reading	44.2 / 46.8 / 52.1	Multivariate F (groups) = 1967.4**	
	• Math	43.9 / 47.2 / 53.5	Multivariate F (interaction) = 21.5**	
	• Vocabulary	12th: 47.8 / 49.6 / 56.6		
	• Reading	48.1 / 49.7 / 56.1		
	• Math	46.4 / 48.4 / 56.8	where ** = significant at α = .001 level	

TABLE 5 (continued)

Site/Sample	Skill(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretation(s)
A national sample of 15,587 seniors who were included in the "NLS Study of the Class of 72"		*Groups:* *General* / *Academic* / *Vocational*		The results from this data base suggest that (1) the indicated basic skills attainments of the vocational students are significantly lower than those of the academic students, and (2) the vocational students' levels of performance in reading and math are significantly less than the related performance levels of the General students, while the two groups' attainments in the area of vocabulary do not differ.
	• Vocabulary	4.5 / 8.2 / 4.3	$F = 2032^{**}$ (Acad. > Gen. ≅ Voc.)	
	• Reading	7.5 / 12.0 / 7.1	$F = 2074^{**}$ (Acad. > Gen. > Voc.)	
	• Math	9.1 / 17.0 / 8.3	$F = 3376^{**}$ (Acad. > Gen. > Voc.)	
			where ** = significant at $\alpha = .001$ level	
Northeastern Florida – a sample of 2,842 seniors		*Groups:** *Grade* / *Vocational* / *Academic*		The results obtained via this data base suggest that (1) the basic skills levels of the vocational students are significantly lower than those of the academic students, (2) the differences between the two groups occur both in the reading and math areas and are similar in magnitude, and (3) although there is considerable variability among the performance level of the subgroups of vocational students, in all cases their performance is lower than that of the academic students.
	• Reading	11th: 42.0 / 61.5 12th: 39.2 / 58.4	11th: $F = 356^{**}$ 12th: $F = 401^{**}$	
	• Math	11th: 47.5 / 65.5 12th: 51.2 / 70.7	11th: $F = 364^{**}$ 12th: $F = 452^{**}$	
		*Means for the individual vocational program areas are presented in Table 3.	where ** = significant at $\alpha = .001$ level	
Central Texas – a total sample of 3,205 non-vocational and 1,751 vocational students		*Groups:* *Grade* / *Vocational* / *Nonvocational*		These results suggest that (1) the basic skills attainments of the vocational students are significantly lower (i.e., by about 17 percentile points) than those of the nonvocational students, and (2) the differences between the two groups occur across all four basic skills areas tested.
	• Reading	9th: 39.8 / 57.4 10th: 40.3 / 59.3 11th: 39.7 / 58.5 12th: 36.1 / 55.8	9th: $F = 445.5^{**}$ 10th: $F = 503.5^{**}$ 11th: $F = 492.0^{**}$ 12th: $F = 514.9^{**}$	
	• English	9th: 34.7 / 51.5 10th: 54.4 / 35.5 11th: 34.9 / 54.3 12th: 32.8 / 53.0	9th: $F = 396.6^{**}$ 10th: $F = 506.0^{**}$ 11th: $F = 510.2^{**}$ 12th: $F = 529.8^{**}$	
	• Math Computation	9th: 39.4 / 57.6 10th: 43.5 / 61.1 11th: 43.4 / 62.7 12th: 37.9 / 59.3	9th: $F = 461.8^{**}$ 10th: $F = 431.4^{**}$ 11th: $F = 563.6^{**}$ 12th: $F = 655.1^{**}$	
	• Math Concepts	9th: 42.6 / 60.7 10th: 45.4 / 64.1 11th: 45.7 / 66.3 12th: 42.1 / 64.4	9th: $F = 457.4^{**}$ 10th: $F = 514.6^{**}$ 11th: $F = 630.1^{**}$ 12th: $F = 721.5^{**}$	
			where ** = significant at $\alpha = .001$ level	

were available, it appeared that business students scored significantly higher than general students, but no other major differences among program groups and the general group were noted.

- Academic, vocational, and general students differed in their level of attainment of both reading and math skills. Information on other basic skills areas is too limited to allow for conclusions of a comparable nature. These other basic skills areas are prime candidates for future research.

Issue Three. Three questions were addressed in relation to this issue. The primary question was, "How do the basic skills levels of vocational students change over time (i.e., from the point of program entry to exit)?" Related queries were, "Did the changes observed in the basic skills of vocational students vary across program (service) areas?" and "How do the observed changes in vocational students' basic skills compare with those of nonvocational students?" Table 6 provides an overview of findings from the literature. Related findings obtained from analyses of extant data sets are summarized in table 7.

The empirical results presented in tables 6 and 7 suggest that:

- In general, vocational students' basic skills levels did not change significantly from what they were when they entered a program. In many of the studies they appeared to decrease slightly, but those changes

TABLE 6

An Overview of the Studies Reporting Changes in the Basic Skills Levels of Vocational and Nonvocational Students

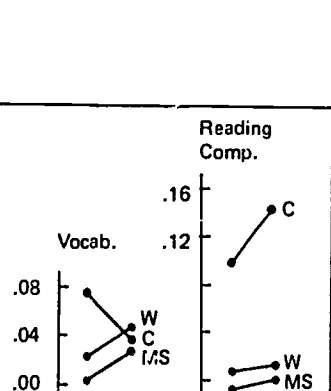
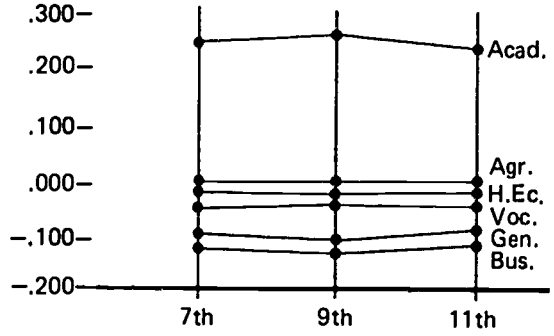
Source	Sample Location Point(s) of Measurement	Skill(s)	Statistics a) Descriptive	Statistics b) Inferential	Summary Interpretation(s)
Hilton, T. L. (1971)	17 communities throughout the nation which participated in the Growth Study were used. The students were 7th graders in September–October 1963, and follow-ups occurred when they were 9th and 11th graders.	• Math STEP • Writing STEP • Listening STEP • Reading STEP	(See the graphs and tables in Figure 5 on page 54.	(Not possible to compute given the reported data.)	The results reported in this study suggest that (1) the vocational students' basic skills levels across all three points of measurement were lower than those of the academic students (i.e., by approximately one standard deviation unit), but quite similar in magnitude to those of the general students, and (2) the rates of change in basic skills levels across groups were quite similar. In regard to the second of these conclusions, it should be noted that the "treatment" efforts associated with various curriculum assignments in grade 9 and above appear to be similar to the effects of the "basic education" curriculum experienced by the students prior to the 9th grade.
Patton, M. J. from Hilton (1971)	A subsample of the Growth Study data was used. The students were tested as 7th graders in 1961 with follow-ups when they were 9th and 11th graders.	• Math STEP • Reading STEP • Listening STEP • Writing STEP		Significant multivariate Fs at the .001 level were reported for the curriculum groups for grades 7, 9, and 11 with significant univariate Fs for all tests at the .001 level.	The results reported in this study suggest that the basic skills levels of vocational and general students are comparable, but that they are considerably lower than the basic skills levels exhibited by academic students. (Although it is stated in the report that the rates of increase vary across groups (with the academic students increasing the most rapidly), concerns with the specific analysis techniques used, associated interpretive problems, and the lack of adequate data in the related report were serious enough that the validity of that conclusion was very questionable and it is, therefore, not included herein.)
Freas, A. (1978)	Eleventh graders at two area vocational schools in Pennsylvania who were tested at the beginning and end of the academic year.	GMRT • Vocabulary • Reading Comp	$\bar{X}$s Vocab. Pre Post / Comp. Pre Post AB* 9.0 8.6 6.9 6.3 AM 8.8 8.8 7.3 7.0 C 9.9 9.6 8.9 9.1 MS 9.2 9.6 7.8 7.7 W 9.6 10.1 7.9 7.8 *The indicated programs are: – AB or Auto Body, – AM or Auto Mechanics, – C or Cosmetology, – MS or Machine Shop, and – W or Welding		The results suggest that (1) the rates of change from pre- to posttest varied for the groups for both tests, (2) on the vocabulary test the machine shop group showed the greatest increase while the greatest decrease was with the auto body group, and (3) on the reading comprehension test the cosmetology group improved most, while the students in the auto body program showed the greatest decrease.

FIGURE 5

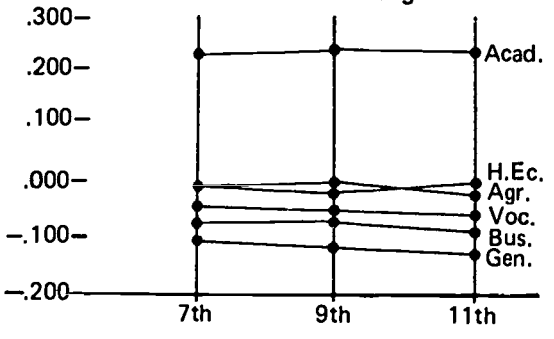
Overview of Observed Changes in Basic Skills Levels
Reported in Hilton (1971)

STEP Math



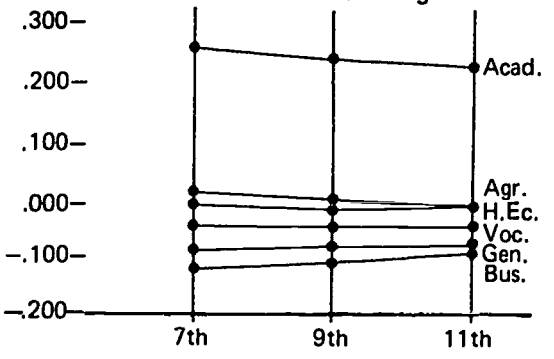
	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	265	258	252	252	246	253	X
7th	12.43	11.02	12.22	13.13	12.79	12.22	SD
	2076	22	664	603	23	312	N
	276	266	261	262	254	264	X
9th	12.16	10.67	12.35	13.35	12.66	11.82	SD
	1893	23	664	599	22	310	N
	282	275	267	267	266	269	X
11th	13.78	11.58	15.50	16.66	15.02	15.44	SD
	2074	23	653	592	22	313	N

STEP Writing



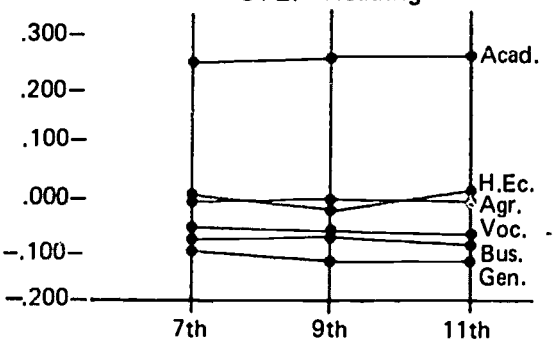
	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	272	257	260	256	255	256	X
7th	15.58	15.97	14.08	14.33	14.57	13.84	SD
	2075	23	661	607	23	310	N
	285	266	272	267	263	268	X
9th	16.26	15.42	15.74	16.62	13.51	17.03	SD
	1888	23	666	601	22	314	N
	296	273	282	277	280	276	X
11th	16.61	10.23	15.32	15.84	13.45	15.69	SD
	2074	23	652	596	21	315	N

STEP Listening



	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	284	271	270	271	266	271	X
7th	13.40	8.69	11.34	12.48	11.08	12.22	SD
	2079	22	668	609	23	311	N
	292	276	278	278	271	278	X
9th	14.01	10.98	12.10	13.27	10.50	12.81	SD
	1868	23	653	573	19	303	N
	297	282	284	283	283	284	X
11th	14.11	11.76	12.64	13.62	13.04	14.18	SD
	2067	23	647	592	21	315	N

STEP Reading

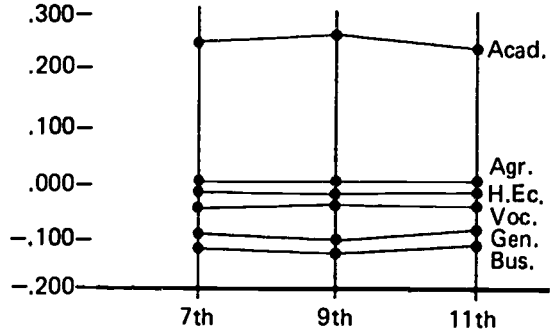


	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	278	259	264	261	256	260	X
7th	16.00	14.62	15.35	16.27	13.12	15.88	SD
	2071	23	659	608	23	311	N
	289	269	277	272	266	271	X
9th	13.54	14.88	15.36	16.63	18.01	16.55	SD
	18.92	22	664	600	22	313	N
	301	280	287	283	282	281	X
11th	15.15	14.40	15.67	16.95	16.52	17.96	SD
	2075	22	648	580	21	316	N

FIGURE 5

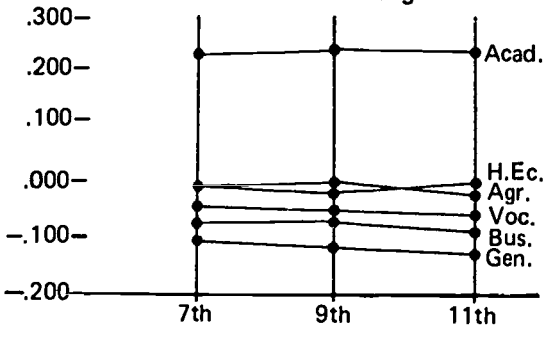
Overview of Observed Changes in Basic Skills Levels
Reported in Hilton (1971)

STEP Math



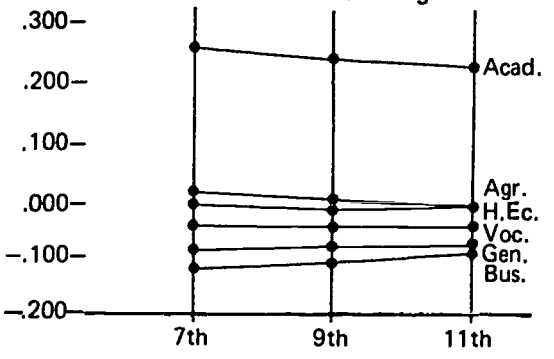
	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	265	258	252	252	246	253	X
7th	12.43	11.02	12.22	13.13	12.79	12.22	SD
	2076	22	664	603	23	312	N
	276	266	261	262	254	264	X
9th	12.16	10.67	12.35	13.35	12.66	11.82	SD
	1893	23	664	599	22	310	N
	282	275	267	267	266	269	X
11th	13.78	11.58	15.50	16.66	15.02	15.44	SD
	2074	23	653	592	22	313	N

STEP Writing



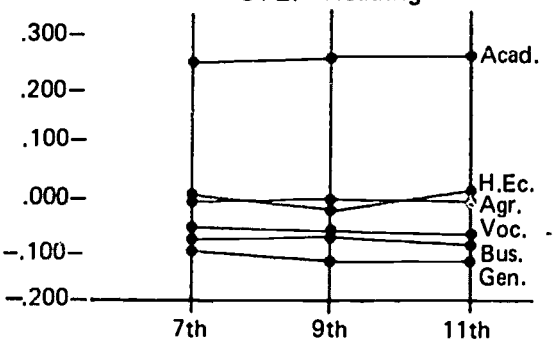
	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	272	257	260	256	255	256	X
7th	15.58	15.97	14.08	14.33	14.57	13.84	SD
	2075	23	661	607	23	310	N
	285	266	272	267	263	268	X
9th	16.26	15.42	15.74	16.62	13.51	17.03	SD
	1888	23	666	601	22	314	N
	296	273	282	277	280	276	X
11th	16.61	10.23	15.32	15.84	13.45	15.69	SD
	2074	23	652	596	21	315	N

STEP Listening



	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	284	271	270	271	266	271	X
7th	13.40	8.69	11.34	12.48	11.08	12.22	SD
	2079	22	668	609	23	311	N
	292	276	278	278	271	278	X
9th	14.01	10.98	12.10	13.27	10.50	12.81	SD
	1868	23	653	573	19	303	N
	297	282	284	283	283	284	X
11th	14.11	11.76	12.64	13.62	13.04	14.18	SD
	2067	23	647	592	21	315	N

STEP Reading



	Ac.	Ag.	Bus.	Gen.	H.Ec.	Voc.	
	278	259	264	261	256	260	X
7th	16.00	14.62	15.35	16.27	13.12	15.88	SD
	2071	23	659	608	23	311	N
	289	269	277	272	266	271	X
9th	13.54	14.88	15.36	16.63	18.01	16.55	SD
	18.92	22	664	600	22	313	N
	301	280	287	283	282	281	X
11th	15.15	14.40	15.67	16.95	16.52	17.96	SD
	2075	22	648	580	21	316	N

TABLE 7

A Summary of the Analyses of Changes in the Basic Skills Levels of Vocational and Nonvocational Students Derived from the Sample of Extant Data Bases

Site/Sample	Skill(s)	Statistics: a) Descriptive				b) Inferential	Summary Interpretation(s)
			Groups:				
		Changes	Voc.	Bus.	Voc. Und.	Gen. & Acad.	
Eastern Wisconsin – a total sample of 162 students	• Reading	11th–9th	.9	-4.9	-.9	2.4	F (Interaction) = .6* F (Change ≠ 0) = .2* where * = not significant	These data suggest that (1) there were no differences among the vocational and nonvocational groups in terms of the changes in their reading levels from 9th to 11th grade, (2) the changes observed across all the groups did not differ from zero, and (3) the changes observed for the vocational groups did not differ appreciably.
			Groups:				
		Changes	Voc.	Bus.	Gen.	Acad.	
Eastern Connecticut – a total sample of 115 students	• Reading	11th–9th	.5	-.4	1.9	3.6	Multivariate F (Interaction) = .7* Multivariate F (Change ≠ 0) = 2.5* where * = not significant	These data suggest that (1) there were no differences among the vocational and nonvocational groups in terms of the changes in their reading or English scores from 9th to 11th grade, (2) the changes observed across all the groups did not differ from zero, and (3) the changes observed for the two vocational groups did not differ appreciably.
	• English		-4.5	-3.5	-1.1	2.7		
			Groups:				
		Changes	T&I	Bus.	Agr.	Home Ec.	
Central California – a total sample of 76 students	• Vocabulary	11th–8th	-.8	-1.7	-3.0	-5.5	Multivariate F (Interaction) = 2.3** Multivariate F (Change ≠ 0) = 81.8** where ** = significant at α = .01 level	These results suggest that (1) the changes in the various groups' vocabulary and math scores did not differ, (2) the Agr. and Home Ec. students' comprehension scores increased significantly more than the comprehension scores of the T&I and Bus. students, (3) the language level of the Agr. students decreased while those for the other groups increased substantially, and (4) across all the groups vocabulary, comprehension, and math levels decreased significantly, while language performance increased significantly.
	• Comprehension		-2.3	-2.5	8.0	5.5		
	• Language		18.0	21.6	-18.0	15.0		
	• Math		-4.3	-8.6	2.0	10.0		
			Groups:				
		Change	Voc.	Bus.	Gen.	Acad.	
Eastern Connecticut – a total sample of 76 students	• Reading	12th–10th	-9.5	-10.0	-9.2	-8.6	Multivariate F (Interaction) = .9* Multivariate F (Change ≠ 0) = 9.1** where * = not significant and ** = significant at α = .01 level	These results suggest (1) the changes in performance observed for the designated groups did not differ appreciably, and (2) across the various groups performance levels decreased from 10th to 12th grade, especially in the area of reading where that decrease was significant.
	• Language		-5.5	3.4	-3.0	-3.3		
	• Math		-4.4	-4.9	-5.4	2.2		

TABLE 7 (continued)

Site/Sample	Skill(s)	Statistics: a) Descriptive	b) Inferential	Summary Interpretation(s)
Central California — a total sample of 170 students	• Vocabulary • Comprehension • Language • Math	Groups: T&I; Off. Ed.; Ag.; Home Ec.; Voc. Und.; Non-Voc. 10th–9th: 5, 11, 4, 7, −7, 6 11th–10th: −7, −7, −8, −4, 3, −7 12th–11th: 3, 3, 5, 8, 8, 7 10th–9th: 3, 4, −1, 2, −8, 4 11th–10th: −8, −7, −9, 2, −1, −7 12–11th: 6, 6, 3, 5, 15, 3 10th–9th: 2, 1, 2, 11, −8, 1 11th–10th: −4, −10, −5, −10, −6, −0 12th–11th: 5, 16, 2, 5, 17, 3 10th–9th: 3, −2, −0, −3, −5, 2 11th–10th: −0, −9, −3, −9, −5, −1 12th–11th: 1, 3, 2, 21, 18, 2	Multivariate F (Interaction) = 1.3* Multivariate F (Change ≠ 0) = 4.4** where * = not significant and ** = significant at α = .01 level	The results obtained via this analysis suggest that (1) the changes in basic skills performance observed for the groups of vocational students and the group of nonvocational students did not differ significantly except that (a) the increase in math performance from 11th to 12th grade observed for the Home Ec. and Voc. Und. groups were greater than the increase observed for the other four groups, (b) the increase in language performance from 11th to 12th grade observed for the Off. Ed. and Voc. Und. groups was greater than the increase observed for the other four groups, and (c) the increase from grade 9 to grade 10 in vocabulary observed for the Off. Ed. group was greater than that observed for the Voc. Und. group; and (2) *across all* the groups performance changed during the indicated time periods—generally it increased somewhat from 9th to 10th grade, decreased significantly from the 10th to 11th grade, and then increased significantly from 11th to 12th grade.
Southeastern Kansas — a total sample of 149 students	• Reading	Groups/Programs; Mean Changes Post-Pre 1. Agriculture: 3.95 2. Auto Mechanics: 2.22 3. Brick Laying: 1.76 4. Building Trades: 2.98 5. COOP Industrial Training: 2.98 6. Drafting: 1.98 7. Farm & Ranch: — 8. Machine Shop: 2.70 9. Nondirected Voc.: 1.23 10. Welding: 1.73 11. Voc. Agriculture: 3.07	The average increase was 2.5 (grade equivalents) with a related t-value of 16.8, which is significant at α = .001 level	These data suggest that for the different vocational students who were placed in a remedial reading program (1) their reading improved significantly between the administration of the pre- and post-tests (usually a period of ½ to a full semester), and (2) the positive effects, i.e., the increase in reading levels, were evidenced for students in each of the service areas where data were available.
Eastern South Dakota — a sample of 143 students	• Reading • Math	Groups: Agr.; Bus.; Health Occ.; Tech.; T&I 11th–9th: 2.5, −1.7, −4.8, −4.5, −1.0 11th–9th: −5.7, 0.0, −.9, −1.7, −2.1	F = .4*, t (change ≠ 0) = 1.0* F = .1*, t (change ≠ 0) = −1.3* where * = not significant	The results obtained via this data base suggest that (1) the changes in basic skills performance for the designated groups of vocational students did not differ appreciably, and (2) the changes observed across all five groups did not differ appreciably from zero, although they did appear to decrease slightly.

TABLE 7 (continued)

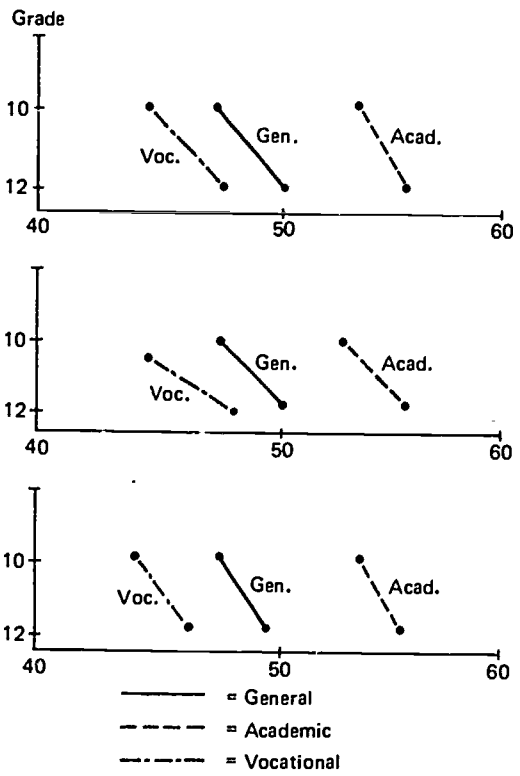
Site/Sample	Skill(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretation(s)
Central Arkansas – a total sample of 335 students	• Reading • Math	*Groups:* Agr. / Bus. / Health Occ. / Home Ec. / Tech. / T&I 11th–9th: -4.0 / -3.1 / -3.3 / -28.0 / 11.5 / -9.1 11th–10th: – / 10.7 / – / 4.8 / – / -1.2 11th–9th: 14.8 / -1.2 / -9.3 / -35.0 / 0.0 / 6.3 11th–10th: – / 4.6 / – / -2.4 / – / 6.8	F = 1.1*, t (change ≠ 0) = -1.3* F = 3.8**, t (change ≠ 0) = .2* F = .7*, t (change ≠ 0) = 2.8** F = 1.3*, t (change ≠ 0) = 2.5** where * = not significant and ** = significant at α = .05 level	These data suggest that (1) generally the changes in performance observed for the designated groups of vocational students did not differ appreciably except for the change from 10th to 11th grade in reading, where the Bus. students' performance increased significantly more than that of the T&I students, and (2) across all the groups there were no appreciable changes in reading performance, but their math performance did increase significantly.
National sample of 26,053 sophomores and 23,147 seniors from the "High School and Beyond Study"	• Vocabulary • Reading • Math	*Performance**  *The related means on these various basic skills measures can be found in Table 3.	Multivariate F (Interaction) = 21.5**, which was presented in Table 3 also, where ** = significant at α = .001 level	These results suggest that although the vocational students scored lower than the general and academic students, the rates of increase in their performance from 10th to 12th grade were greater than those of the other two groups.

TABLE 7 (continued)

Site/Sample	Skill(s)	Statistics a) Descriptive			b) Inferential	Summary Interpretation(s)
			Groups:			
		Change	Vocational	Nonvocational		
Northeastern Florida — a sample of 2,842 seniors	• Reading	12th–11th	-1.9	-3.1	Multivariate F (Interaction) = 3.2**	These data suggest that (1) the nonvocational students' reading performance decreased significantly more than the vocational students', while both groups' math scores increased by comparable amounts, and (2) both groups (combined) reading levels decreased significantly while their math performance increased significantly.
	• Math	12th–11th	4.7	5.4	Multivariate F (Change ≠ 0) = 214.6**	
					where ** = significant at α = .05 level and *** = significant at α = .001 level	
Southeastern Pennsylvania — a sample of 2,238 students		Change	Vocational			The results obtained via this data base suggest that the reading scores of the vocational students sampled did change appreciably over the indicated time period. However, their math scores did not change significantly.
	• Reading	12th–11th	3.3		t = 2.8**	
		11th–10th	-2.4		t = 3.6**	
		10th–9th	3.6		t = -2.4**	
		9th–8th	2.8		t = 2.7**	
	• English	12th–11th	—		—	
		11th–10th	—		—	
		10th–9th	—		—	
		9th–8th	—		—	
	• Math	12th–11th	-3.0		t = -1.8*	
		11th–10th	—		—	
		10th–9th	—		—	
		9th–8th	—		—	
					where ** = significant at α = .01 level, and * = not significant	
Central Texas — a total sample of 4,956 students			Groups:			These data suggest that (1) generally speaking, the vocational students' performance on the designated basic skills criteria did not increase as much as the performance of the nonvocational students (typically during the 10th and 11th grades), but did decrease significantly more than that of the nonvocational students (typically in the 12th grade), and (2) the patterns of changes in performance observed for the two groups across the four designated basic skills areas were quite similar.
		Change	Vocational	Nonvocational		
	• Reading	12th–11th	-3.6	-2.7	Multivariate F (Interaction) = 11.0**	
		11th–10th	-.6	-.8		
		10th–9th	.4	1.9	Multivariate F (Change ≠ 0) = 90.4**	
	• English	12th–11th	-2.1	-1.3		
		11th–10th	-.7	-.0	where ** = significant at α = .001 level	
		10th–9th	.9	2.9		
	• Math Computation	12th–11th	-5.5	-3.3		
		11th–10th	-.2	1.5		
		10th–9th	4.1	3.5		
	• Math Concepts	12th–11th	-3.6	-1.9		
		11th–10th	.3	2.2		
		10th–9th	2.8	3.4		

typically were not significant and could represent "chance" occurrences.

- Program or service areas in which vocational students were enrolled did not appear to affect differentially the observed changes in their basic skills levels.
- The changes in performance observed for vocational and nonvocational students did not appear to differ significantly in most of the studies, particularly those that involved large national samples of students. In several cases involving more restricted samples, however, the results indicated that changes in basic skills observed for vocational students differed somewhat from those of the nonvocational students, particularly the general students. Consequently, additional research involving larger, less restricted samples should be conducted in order to investigate these differences further, the conditions under which they tend to occur, and their potential causes.
- No systematic differences in changes across different basic skills areas (i.e., reading and math) appear to exist. Although several such differences were noted, they were not consistent from one study to the next, and in the majority of cases no differences were observed.

Issue Four. The primary question raised in relation to this issue was, "How do the basic skills levels of vocational education students relate to selected vocational education outcomes, such as employment, earnings, and additional training?" Another

question considered was, "Do the relationships between basic skills attainment and various vocational education outcomes observed for vocational students differ from the corresponding relationships observed for nonvocational students?" The data regarding these questions are limited in scope. Findings from the literature are summarized in table 8 and results of analyses of various data sets are presented in table 9.

The information contained in tables 8 and 9 suggests that:

- Because of the limited set of results from the literature, as well as basic weaknesses in the data sets obtained (e.g., the high incidence of missing data and the nonrepresentative nature of much of the criterion information available), no general conclusions can be reached regarding this issue and additional, more rigorous research and data collection (e.g., through improved VEDS procedures) should be undertaken.
- Two tentative conclusions or hypotheses suggested by the limited data are that: (1) for vocational students, the level of basic skills attainment is significantly related to such outcomes as employment, employment in the area of training, salary, and participation in additional education or training, and (2) for vocational students, the relationships between basic skills levels and employment-related outcomes appear to be stronger than they are for nonvocational students, but that for education-related outcomes the situation is reversed.

Reported Relationships Between Selected "Vocational Education Outcomes" and Basic Skills Levels of Vocational Education Students

Source	Sample Location Point(s) of Measurement	Outcome	Descriptive Statistics	Summary Interpretation(s)
Flanagan, J. C. (1964)	A questionnaire was given to the sample of students from Project TALENT one year after graduation.	• Did *not* enter college one year after grade 12	See table below	The results suggest that for the high-ability students, the percentages of students not attending college was comparable for the college prep, business (males), vocational, and agriculture areas. However, for the remainder of ability levels, the differences between the academic and other curricular areas are much greater.

Percentile Rank on Gen. Acad. Apt. Comp.	*Percentage by Curriculum*					
	Gen.	*Coll. F/Up*	*Bus.*	*Voc.*	*Agr.*	*Other*
90.0–99.9	29.1	8.3	•	12.9	14.3	32.9
75.0–89.9	43.1	16.7	71.3	74.1	52.3	35.4
50.0–74.9	59.0	25.9	80.6	81.0	59.3	58.0
25.0–49.9	72.5	34.5	84.9	82.9	76.3	65.4
0.0–24.9	85.8	46.9	89.4	89.9	83.0	81.2

• In this category the related percentages for males is 7.7, while that for females is 52.6.

NOTE: The only other study located that partially relates to this objective was reported by J. R. Warren. Follow-up analyses by Warren on the Hilton study (1971) examined post high school behavior for college and non-college preparatory students in conjunction with the students' academic aptitude and SES. His findings from a path analysis revealed that (1) for men, the independent effect of aptitude in educational attainment (.32) through the first year after high school was about as strong as the effect of curriculum (.43); and (2) among women, the curricular effect (.45) was stronger than the independent effect of aptitude (.16). However, from these analyses it is impossible to separate out the effects of attitude and social class on choice of curriculum as they affect post high school educational attainment for males and females. One must also remember that (1) this follow-up was based on self-report data, and (2) this study did not distinguish between the vocational, general, or academic students, but rather distinguished only between college-bound and noncollege-bound students.

TABLE 9*

Relationships Between Selected "Vocational Education Outcomes" and Basic Skills Levels for Vocational and Nonvocational Students

Site/Sample	Outcome(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretation(s)
Northeastern Florida — 1,077 vocational and 1,447 non-vocational students		*Groups**	*Significance of Mult R's*	The results obtained via this data base suggest that (1) vocational students' basic skills levels are significantly related to their attending college full-time, to their being employed, both part-time and full-time a year or so after leaving school, to their looking for work if unemployed, to securing a job related to their training, and to their salary; and (2) the relationships between nonvocational students' basic skills levels and the indicated outcomes vary somewhat from those of vocational students. In particular, their skill levels, unlike those of the vocational students, are not significantly related to their being employed part-time, to whether their job is in their area of training, or to the salary they receive.
		Vocational / *Nonvocational*	*Voc-R* / *Nonvoc-R*	
	• Attending College (full-time)	Mult R = .10 / Mult R = .28	• / ••	
	• Attending College (part-time)	Mult R = .06 / Mult R = .05	ns / ns	
	• Employed (full-time)	Mult R = .13 / Mult R = .16	•• / ••	
	• Employed (part-time)	Mult R = .11 / Mult R = .07	•• / ns	
	• Unemployed (looking)	Mult R = .18 / Mult R = .15	•• / ••	
	• In current job related to training	Mult R = .16 / Mult R = .06	•• / ns	
	• Salary (all students in group)	Mult R = .10 / Mult R = .04	• / ns	
		* The predictor variable employed in computing these correlations are the students' basic skills scores.	Where: ns = not significant • = significant at α = .05 level •• = significant at α = .01 level	
Central Arkansas — a total sample of 335 vocational students		*TIMES**	*Significance of Mult R's*	These data suggest that the sampled vocational students' basic skills levels are not significantly related to any of the designated outcomes.
		Before 9th / *10th* / *11th* / *12th*		
	• Employed?	Mult R: .07 / .34 / .12 / .22	ns ns ns ns	
	• Employed in area of training?	Mult R: .17 / .18 / .13 / .13	ns ns ns ns	
	• Salary?	Mult R: .07 / — / .38 / .53	ns — ns ns	
	• Participation in additional training?	Mult R: .09 / .37 / .20 / .09	ns • ns ns	
		*TIMES indicated are when the basic skills measures (predictors) were completed by the students.	where: ns = not significant • = significant at α = .05 level	

*It should be noted that interpretation of the results in this table are based primarily upon the two sites with large samples since the multiple Rs for the outcome measures for the other sites are based on very small samples (about 30-40 students) and are affected by high incidence of missing outcome data. Thus, the related regression equations are very sensitive to peculiarities in the respective samples.

TABLE 9 (continued)

Site/Sample	Outcome(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretation(s)
Western North Carolina – a total sample of 199 vocational students		*TIMES/GROUPS**		These data suggest that the basic skills levels of this sample of vocational students are not significantly related to their attainment of the designated outcomes.
		9th-GP.1 *9th-GP.2* *9th-GP.3* *11th*	*Significance of Mult R's*	
	• Employed?	Mult R: .14 .04 – .06	ns ns ns	
	• Employed in area of training?	Mult R: .17 .09 – .13	ns ns ns	
	• Participation in additional training?	Mult R: .07 .16 – .03	ns ns ns	
		*TIMES/GROUPS indicated are when the basic skills measures (predictors) were completed and what test forms were taken (at the 9th grade level).	where: ns = not significant	
Southeastern Kansas – a total sample of 214 vocational students		*Multiple R's*	*Significance of Mult. R's*	These data did not yield any significant relationships between the designated outcomes and the basic skills attainments of the sampled students.
	• Employed?	.33	ns	
	• Employed in area of training?	.49	ns	
	• Wages (per hour)?	–	–	
	• Participation in additional training?	.36	ns	
			where: ns = not significant	
A national sample of 15,587 seniors who were included in the "NLS Study of the Class of 72."		*GROUPS*		These results suggest that (1) vocational students' basic skills levels are significantly and positively related to each of the designated outcomes, and (2) the relationships between basic skills performance and the designated outcomes observed for nonvocational students differ somewhat from those observed for vocational students. In particular, the strength of the relationships for the first three (work-related) outcomes for the nonvocational students appear to be less than they are for the vocational students, while the situation appears to be reversed for the final three outcomes (education-related).
		Vocational *Nonvocational*	*Significance of Mult R's*	
	• Working in Fall 1973?	.14 .09	•	
	• Working in Fall 1974?	.16 .04	•• ns	
	• Working in Fall 1976?	.15 .09	•• •	
	• Attending school in Fall 1973?	.17 .36	•• ••	
	• Attend school from 1973-1974?	.15 .41	•• ••	
	• Certificate of some kind from high school?	.14 .22	•• ••	
			where: ns = not significant • = significant at α = .05 level •• = significant at α = .01 level	

Programmatic Strategies for Improving Vocational Students' Basic Skills

This section of the report describes materials that include specific techniques for incorporating and improving basic skills instruction in the vocational classroom. These materials should serve as a source of ideas and insights into what is currently being done or can be done to change or to improve vocational students' basic skills attainment. In addition, they should provide useful information for vocational education decision-makers and practitioners who are engaged in program planning and operation.

It is important to note that research on the basic skills in vocational education is in its early, developmental stage. Evaluations of the relative success of various strategies, techniques, and activities used to teach basic skills in vocational education are virtually nonexistent. Thus, the materials that follow represent a synthesis of a meager amount of information that will most likely change as additional research is completed in the field.

In this report, the results of studies of current and proposed attempts to foster the development of vocational students' basic skills are organized according to the program strategy concept defined in the Introduction. Program strategy includes four components--evaluation, instructional planning, program development, and instructional methods. In the sections that follow, the studies related to each of these components are described in turn, along with their implications for infusing

basic skills instruction into vocational education programs. (These studies are described further in Appendix B.)

Evaluation. Stufflebeam, et al. (1971), define evaluation as ". . . the process of delineating, obtaining, and providing useful information for judging decision alternatives" (p. 42). Although research on basic skills and vocational education indicates that students are exposed to a variety of learning activities involving basic skills, it fails to mention how these activities relate to improvement in performance. For example, many basic skills programs offered in vocational settings use some form of standardized instrument as a pretest but typically do not use them to provide adequate information for studies of program effectiveness. In short, it is difficult to appraise potential decision alternatives based upon the available basic skills-vocational education literature, because most studies do not include systematic program evaluations.

Context evaluation entails the clarification of objectives, identification of needs and resources, and explication of problem areas. Diagnosis and the use of standardized tests are an important part of this type of evaluation. The information available on conducting context evaluation is very sparse, and program planners and practitioners should devote more effort to ensuring that their programs are planned and implemented using all of the contextual resources and factors available to them.

Input evaluation is concerned with the assessment of resources relative to program goal attainment, including relevant capabilities of affected students and strategies for achieving

program goals. Literature on basic skills in vocational education, however, contains little evidence to suggest that systematic input evaluation takes place. The information that is available indicates that externally funded programs tend to engage in more input evaluation activities than do programs funded via internal, system budgets. Also, although basic skills deficiencies are believed to be widespread, most programs are able to serve only a small percentage of their respective school populations, and in many instances, adequate staff and support materials are lacking. Such conditions reinforce the need for and importance of input evaluation as one source of information for making decisions on the implementation of basic skills programs in vocational settings.

Neither were process evaluations, which entail monitoring programs to ensure that their goals and objectives are being met, generally represented in the research literature. Typically, basic skills programs in vocational settings do not incorporate the routine, ongoing assessments and follow-ups, which characterize this type of evaluation.

Product evaluation is essentially concerned with measuring and reporting whether or not specified program goals have been achieved by a given program. The literature review indicated that even this type of evaluation is sadly lacking in the field. For example, although a number of basic skills programs in vocational settings used diagnostic instruments as part of their pre-program activities, there is little information on the attainment of related criterion performance or on how the program

is integrated into the overall vocational training effort. Also, the literature reveals that most programs or studies fail to use a systematic experimental or quasi-experimental paradigm as a basis for conducting their respective product evaluation efforts.

In summary, evidence in the literature clearly indicates that programs to improve the basic skills of vocational students are failing to address even minimal evaluation criteria. If such programs are to be continued and improved, integrated evaluation procedures must be routinely specified and implemented. Although sketchy, the literature suggests several important concerns that should be addressed in any such evaluation process:

1. Assessing the learning needs of students should be emphasized. Individualized programs or individually tailored learning strategies appear to be essential to the successful implementation of basic skills in vocational education.
2. A variety of assessment techniques, ranging from valid, standardized tests to subjective assessments, should be used by teachers and related support personnel.
3. Exemplary evaluations of programs should be more systematically and widely disseminated.
4. In future instructional programs, all four aspects of evaluation--context, input, process, and product--should be emphasized.
5. Systematic evaluation should be routinely used as the basis for decisions regarding the effectiveness of

curricula and learning strategies that are specific to individual student needs.

6. The evaluation should yield data that answer basic accountability questions.

In the future, evaluation must be a focal point in the design and operation of basic skills programs for vocational students. Such assessment efforts must also be more comprehensive and go beyond mere diagnosis and measurement if they are to be effective.

Instructional planning. This component of program strategy focuses upon the activities essential to the development of the general and specific goals that delineate the purpose of an instructional program. The literature review yielded very little information regarding this component. It was generally assumed that planning had taken place and that published reports and materials began at the implementation stage. It became quite obvious during the review process, however, that sufficient emphasis had not been placed on planning. In many studies, program decisions appeared to be based upon factors and information other than those addressed in a sound instructional planning model (i.e., development of a plan of action, program funding strategy, and provisions for flexible programming).

The plan of action for an instructional program consists of three parts--statements of (a) general purpose of the program, (b) related program objectives and (c) learning objectives. The literature review indicated that in many of the studies:

- Clear statements of the purposes of programs, which provide a description of program goals and philosophy, were not routinely developed and communicated among school staff;
- Although general objectives for incorporating basic skills instruction in vocational programs were developed, specific objectives for each basic skill area (i.e., math, reading, writing, and oral communication) were not routinely prepared; and
- Specific learning objectives were not developed collaboratively by vocational teachers, basic skills teachers or specialists, and counselors, nor did they address the program holistically, i.e., by systematically encompassing the needs and concerns of all segments of the program.

The second major concern in planning a program to incorporate basic skills instruction in vocational settings is funding. For example, if the teaching of basic skills were incorporated as a regular part of the vocational education program, the costs would be different than if the basic skills instruction were offered as a supplemental or a remedial program. The literature provided very little information on cost estimating, and in most instances, funding decisions were based upon considerations other than cost effectiveness. For example, new state initiatives or guidelines, the availability of external support, or changes in federal law that place new requirements on schools frequently have greater impact upon the allocation of funds than

do the needs of students, availability of staff and facilities, specific program purposes and objectives, and the like.

Providing for and incorporating flexible programming or scheduling into the instructional planning process can have far-reaching implications. Although such provisions are not extensively discussed in the literature, the information that is available suggests the following:

- Generally, one of three approaches is used--providing such instruction within the vocational classroom, in a special, separate classroom via referral for remediation, or in a learning center where basic skills are only one aspect of the specialized learning that is taught.
- The special classroom or learning center approaches are more widely used than the integrated approach*.
- Regardless of the specific approach used, the instruction, per se, should be individualized because the students who participate in the program will not all be functioning at the same level and should be given opportunities to advance based upon their particular needs;
- There should be an ongoing awareness of and concern for resolving scheduling problems or conflicts--for example, when using a remedial approach, (a) if students must

---

NOTE: Although the integration of basic skills instruction in vocational classrooms is not extensively discussed, it is possible that the literature does not adequately reflect actual practices. Most of the studies were funded by external sources, a practice which tends to foster the dissemination of the associated results and concurrently yields a biased or atypical sample of programs and practices.

leave their regularly scheduled vocational classes several times a week to participate in the basic skills program, they may fall behind in their vocational classwork and related skill training, and interstaff conflicts may result or (b) if the basic skills program is offered either before or after school, transportation problems are likely to arise.

Program development. This aspect of program strategy concerns the explication of staff training objectives, program operation, program materials, and related support service requirements. Today's society requires that instruction be provided for a large, diverse group of students who are differentially motivated and yet expected to acquire increasingly complex technical and academic skills. Vocational education programs must, therefore, take into consideration variations in the basic skills of entering students, since those variations will have direct implications for the teacher's choice of reading materials, instructional techniques and pace of instruction, the decision whether or not to individulize instruction, and the need for support services.

Staff training is one way in which vocational teachers can be better prepared to meet the kinds of challenges described above. The literature suggests that the following concerns should be considered in providing such training:

- Preservice training of vocational teachers should include course work that helps vocational teachers see basic skills as part of their mission, acquaints them with

basic skills concepts, and prepares them to teach basic skills effectively.

- Inservice training should be undertaken to help teachers acquire or augment a teaching repertoire that incorporates basic skills as an integral component.
- Awareness of individual student needs should be heightened and teachers trained to respond to those needs appropriately.
- Individualized instruction should be a part of inservice training.
- Teachers should be better trained to improve their students' basic skills acquisition by assigning them practical problems that are relevant to their individual vocational interests or by relating lessons to activities that are encountered on the job, e.g., using special materials such as Mathematics for the Baker (Bogdany 1976), or using Popular Mechanics as a reading reference for auto mechanics students.
- Training should teach instructional staff (a) how to adapt or to adopt commercial materials to meet the needs of particular students and (b) how to design or develop their own vocationally-relevant, basic skills materials where none exist.
- Training should be offered to foster and maintain the effective student-teacher relationships that are so crucial to effective individualized instruction.

- Instructional staff need to be trained to develop and implement simple plans for improving their instructional effectiveness (plans that incorporate such techniques as homework problems, quizzes, mastery tests, written assignments, and so forth).

Program operation refers to decisions regarding the use of time, space, and other resources in order to facilitate the instructional goals of the program. Although program operation was rarely discussed in the literature, its importance should not be underestimated. Issues of time and space allocation are significant factors to be considered during the planning and operation of any instructional effort.

Instructional materials, a third program development factor, refer to "any device with instructional content or function that is used for teaching purposes" [Good (ed.) 1973, p. 360]. A number of studies suggest the following:

- Vocational teachers and basic skills instructors should use varied, practical instructional materials and examples to improve vocational students' basic skills levels.
- Community resources designed to enrich the instructional process--libraries, employment settings, specific workers, and the tasks used in specific jobs--should be utilized.
- When written instructional materials are used, emphasis should be placed on materials that employ (a) carefully defined, simple vocabulary, (b) job-related

vocabulary and (c) a systematic method of controlling both vocabulary and concept utilization and integration during the instructional process.

- The materials employed should also reflect a range of differences in content and approach that appeal to the diverse interests and learning styles of the students.

The support service aspect of program development refers to those services provided to students by specially trained staff or volunteers to enrich the instructional process. The literature suggests that:

- Services available to different programs will vary in their degree of comprehensiveness and intensity depending on the program's philosophy, goals, budget, and personnel as well as the characteristics of the affected students.
- Such services can be used to assist teachers in a variety of ways, including diagnosing problems, providing motivational interviews and experiences, and reinforcing specific instructional outcomes or behaviors.
- Creativity should be exercised in the area of support services, particularly with regard to developing and utilizing volunteer services.

Instructional methods. This final program strategy component consists of the activities and models used by teachers to create the experiences intended to foster student attainment of specified program and learning objectives. In this context, a learning experience "refers to the interaction between the

learner and the external conditions in the environment to which he (she) can react" (Tyler 1970, p. 63). During the actual teaching-learning process, teachers must select the most appropriate models and activities to use with their students. That selection process is guided by the program objectives and by the specific learning needs of individual vocational students.

During the literature review, the specific models and activities listed in Appendices B and C were identified. Although several of the models and activities cited were linked in the literature to specific basic skills areas (e.g., to mathematics or reading), most of them are general and should be applicable to more than one basic skills area. Ingenuity should be used in applying those models and activities as well as in defining new relationships between them and the attainment of stated program and learner objectives.

Conclusions and Recommendations

The empirical results derived from both the literature review and the analyses of the sixteen data sets led to a number of general conclusions. A summary of those conclusions is presented in figure 6.

Reviewing the literature to identify or describe specific techniques for incorporating or improving basic skills instruction in vocational education revealed an information base representing a potpourri of research and development activities that vary substantially both in quality and focus. The following conclusions regarding the four components of an instructional (program) strategy are based on that review:

FIGURE 6

Summary of the Major Conclusions Drawn from the 12 Reviewed Studies and 16 Data Bases

ISSUE	RELATED CONCLUSIONS
1. To describe, from a national perspective, the basic skills proficiencies of secondary vocational students.	1.1 The average performance of secondary vocational students on standardized basic skills measures appeared to be somewhere between the 35th and 40th percentiles (or about ½ standard deviation unit below the average for all secondary students). Using the decision rules that are currently available this discrepancy in average performance would be deemed to be both statistically and "educationally" significant. 1.2 Relatively speaking, the basic skills levels of students who are entering secondary vocational programs are about the same as those of students who are completing or exiting those programs. 1.3 The performance of students enrolled in business was generally higher (45th percentile) than that of students enrolled in agriculture, health, technical, and T&I programs (40th percentile), which in turn was generally higher than that of students who were enrolled in distributive education (35th percentile) and home economics (32nd percentile).
2. To compare the basic skills attainments of secondary vocational students with those of students who are enrolled in other curricula (i.e., the academic and general curricula).	2.1 The basic skills attainments of secondary vocational students are typically (a) significantly lower than those of academic or college preparatory students and (b) comparable to those of general students. 2.2 Vocational students enrolled in all seven major program areas scored significantly lower than academic students on the basic skills criteria, but the performance of student in the different program groups varied about the average observed for the general student (i.e., business students scored higher; agriculture, health, technical and T&I students scored about the same; and distributive education and home economics students scored lower than the general students).
3. To describe how participation in vocational education relates to changes in basic skills	3.1 Vocational students' relative levels of basic skills attainment did not change significantly between program entry and exit. 3.2 The program or service area in which students were enrolled did not appear to be significantly correlated with observed changes in their basic skills levels. 3.3 The changes in basic skills performance observed for vocational and nonvocational students did not differ significantly.
4. To increase our understanding of the relationships among secondary students' basic skills, their participation in vocational education, and various "outcomes" like employment, earnings, and participation in further training.	4.1 The limited and unreliable nature of the data available regarding this issue, made it impossible to reach any general conclusions. However, the results that were available tentatively suggest that (a) vocational students, basic skills attainments have a significant positive relationship with such outcomes as being employed, salary, and participation in further training, and (b) the relationships between vocational students' basic skills levels and employment-related outcomes are stronger than those of nonvocational students, but that for education-related outcomes the situation is reversed.

- Evaluation Considerations
  - Most of the studies of basic skills in vocational education do not contain systematic program evaluations, if they report any evaluations at all.
  - The evaluations that are reported are typically limited in focus and do not address the context, input, process, and product considerations that characterize a comprehensive evaluation scheme.
  - Greater attention should be given to the identification and utilization of appropriate measures of performance in the basic skills and related assessment techniques.
- Instructional Planning Considerations
  - Clear statements of program goals and philosophies did not appear to be routinely developed or communicated among school staff--vocational personnel, basic skills specialists, and other support staff.
  - Statements of vocational goals and objectives typically failed to include those aspects of vocational skills that entail the basic skills.
  - If learning goals and objectives were developed, they did not usually reflect a collaborative effort on the part of school staff.
- Program Development Considerations
  - Very little research has been conducted on program development. Although descriptions of specific program development components were frequently provided, they

were usually quite brief; they were not systematically linked and were not related to other program strategy issues, such as evaluation.

- Goals and objectives should be developed and disseminated, as well as related instructional materials and techniques, for conducting preservice and inservice training of both vocational and basic skills instructors to better prepare them to address the basic skills needs of vocational students.
- Few of the available instructional materials can be easily adopted, adapted, or routinely used to address the unique learning needs of individual students. In most of the studies, a substantial portion of time and resources was spent either developing or adapting instructional materials.

- Instructional Methods
  - Although a variety of potentially useful activities and models was cited in the literature, typically their applicability to teaching basic skills in vocational settings was not clearly illustrated or described.

The various conclusions noted in figure 6, along with those listed above, lead to the following kinds of developmental and operational recommendations for the improvement of basic skills programming in vocational settings and related research activities.

- Additional research on the ramifications of the "less than average" basic skills attainment exhibited by

vocational students should be conducted. Although the reported data indicate that vocational students' basic skills levels are typically below average, they fail to yield significant insights regarding either the level of basic skills deemed essential to perform various occupational tasks successfully or the sufficiency of the basic skills levels exhibited by vocational students relative to such a set of standards.

- Additional data should be acquired on the nature and pervasiveness of various district-level obstacles to the design and implementation of systematic evaluations of basic skills programs in vocational settings.
- The procedures, techniques, and instruments used to evaluate the basic skills attainment of vocational students should be carefully reviewed and evaluated to ensure their adequacy, sensitivity, and validity.
- A variety of innovative and potentially effective strategies for incorporating basic skills instruction in vocational settings needs to be identified and evaluated.
- New and varied funding sources that can be used by LEAs to increase and improve basic skills instructional programming afforded their vocational students need to be explored and their availability publicized.
- More efficient and effective dissemination mechanisms and networks need to be developed to foster the exchange of information on basic skills programs and materials that have been shown to be effective in vocational settings.

- Teacher education programs, both for vocational educators and for basic skills specialists, need to incorporate information and techniques for dealing with the unique basic skills needs and problems of vocational students.
- Additional research should be conducted on the unique characteristics and concerns of vocational students that may affect their acquisition of the basic skills necessary to succeed both in school and on the job.
- Additional funding should be allocated or designated to conduct the kinds of research and development activities noted above as well as to foster improvement in basic skills instruction in vocational settings. Such current and pervasive problems as decreasing productivity and increasing technology demand that all students, including vocational students, exhibit greater basic skills attainment.

PART III

DROPOUTS, BASIC SKILLS, AND VOCATIONAL EDUCATION

Orientation to the Problem

Dropouts, largely ignored for the past several years as a research topic, continue to pose serious problems not only for themselves, but for the general public as well. As a group, they tend to feel frustration and hopelessness; as a group, they fail to retain entry-level jobs or to progress up the employment ladder; as a group, therefore, they are more often than not counted among the chronically unemployed, publically assisted, or delinquent. Vocational education, coupled with a strong basic skills program, is perhaps the only means available within the context of public education to address the roots of the dropout problem.

Studies indicate that by the time a potential dropout can be identified, efforts made to direct that student toward the completion of a college-preparatory or vocational training curriculum usually fail. It is only a matter of time before a potential dropout becomes an actual dropout. Yet while potential dropouts continue within the educational curriculum, they are frequently tracked into vocational training; dropouts, likewise, when and if they return to the educational curriculum, usually return to it for training. It is in this framework that vocational educators are presented with a unique opportunity; for dropouts and potential dropouts lag furthest behind their peers in the area of the basic skills. They have learned little and retained less. Yet the basic skills are essential not only to occupational success,

but also to successful integration into all aspects of society. Thus, by incorporating a basic skills component into vocational training, and thereby addressing the affective as well as the cognitive domain, vocational educators may be able to provide successful instruction in the basic skills, enhance the retention rate of potential dropouts, and improve the training afforded dropouts who have returned to the program.

Who Are the Dropouts?

At the turn of this century, only 11 percent of all high school youths were actually in school (Thornburg 1974). By 1909, only thirteen of every 100 children who enrolled in the first grade were still in school at age sixteen (Schneider 1981). Now, although approximately 90 percent of all high school-aged youths begin high school, approximately 30 percent of the students entering fifth grade will leave high school prior to graduation (Sewell, Palmo, and Manni 1981). This statistic takes into account the variability of the dropout rate from state to state and from urban to rural areas.

Although we have obviously seen a significant increase in the retention rate, the "dropout factor" remains a problem largely because our educational system has evolved from an elitist to a public stance in the eight decades since the turn of the century. A 30 percent dropout rate assumes greater meaning and criticality in view of the characteristics of potential dropouts and dropouts themselves.

Research indicates that the prototypical potential dropout displays the following characteristics, which are listed in detail in Appendix E-1.

- Cognitive factors. Potential dropouts typically:
  - Are at least one year behind their grade-level in reading and mathematics achievement
  - Are academically below average and evidence a trend of declining grades
  - Exhibit a lack of goal orientation in school
  - Are classified as slow learners (IQs of 75 to 90) or have a mean IQ of 90
  - Seldom question or reason critically
- Affective factors. Potential dropouts typically:
  - Demonstrate failure syndrome by habitually refusing to try and by being easily discouraged
  - Manifest low self-esteem
  - Are categorized by teachers as uncooperative, inattentive, and unmotivated
  - Display an active dislike of school
  - Feel alienated, isolated, insecure, and inadequate
  - Do not participate in school affairs
  - Are socially immature
  - Are not accepted by teachers
- Other factors. Potential dropouts typically:
  - Have poor attendance records
  - Are older than their grade level peers

- Come from low socioeconomic backgrounds frequently accompanied by a lack of parental emphasis on the importance of education
- Have parents whose own educational attainment level is low

Research indicates that the prototypical dropout displays the following characteristics, which are listed in detail in Appendix E-2.

- Cognitive factors. Dropouts typically:
  - Score low on intelligence tests (mean IQ = 90)
  - Have repeated at least one grade
  - Have limited academic success accompanied by poor academic performance
  - Read poorly, have poor computational skills, and tend to show little or no improvement in either area
- Affective factors. Dropouts typically:
  - Are loners and feel alienated from the school environment itself, from teachers, and from peers
  - Are not accepted or respected by teachers
  - Tend to lack interest in school or schoolwork
  - Have a low self-concept, evidence little satisfaction with self, and exhibit characteristics of social immaturity
  - Are either hostile and unruly or passive and apathetic

- Other factors. Dropouts typically:
  - Are sixteen to seventeen years of age and are older than their classmates
  - Are members of low-income families in which neither parent finished high school
  - Are from weak or broken homes
  - Were not encouraged by parents to stay in school or were actually encouraged by them to leave school to contribute to family support
  - Tend to be members of a minority group
  - Display excessive absenteeism or irregular attendance
  - Do not participate in extracurricular activities

Selected Empirical Results Regarding the Basic Skills of Dropouts

Nineteen studies were identified that contained empirical data dealing with the following questions or issues concerning dropping out of school and basic skills proficiency:

- What levels of basic skills attainment are exhibited by both potential and actual secondary school dropouts?
- How do the basic skills levels of secondary school dropouts compare with those of completers?
- What changes, if any, are observed in the basic skills levels of potential and actual dropouts who are afforded the opportunity to participate in some form of basic skills/vocational educational program?

- What relationships exist between selected vocational education outcomes (e.g., earnings, employment, and so forth) and dropping out of school?

In thirteen of the nineteen studies cited, subjects participated in some form of vocationally-oriented training effort. In the remaining studies they were simply "tracked" across varying periods of time, and no direct interventions were undertaken other than to collect pertinent project data. Abstracts of these studies appear in Appendix D.

In relation to the initial issue cited above, the major question posed was, "At what levels of basic skills are potential and actual secondary school dropouts functioning?" An associated concern was, "Are the performance levels exhibited by dropouts comparable across different basic skills areas?" Results of research related to these questions are summarized in table 10.

The information presented in table 10 suggests the following:

- The basic skills levels of both potential and actual secondary school dropouts are well below average and expected grade level. Across the various basic skills areas they score at or near the twenty-fifth percentile on some standardized tests, which translates into a grade-equivalence rating of approximately 5.4 on other measures.
- The differences between the reading or verbal and mathematics or quantitative skills of potential and actual dropouts appear to be about the same. The information

TABLE 10

A Summary Description of the Basic Skills Levels of Potential/Actual Secondary School Dropouts

Source	Basic Skill(s)	Statistics	Related Standards	Summary Interpretation(s)
Austin, J. J. and Sommerfeld, D. A. (1967)		*Group Averages (Prior to Training)* *Program* (n=181) / *Control* (n=82) / *Overall* (n=263)	*Related Percentiles* *Program* / *Control* / *Overall*	The results of this study suggest (1) the clients being served were well below average on their basic skills performance when they entered the program, and (2) their performance in reading was slightly higher than their performance in math (although both were extremely low).
	• Reading (WRAT)	86 / 85 / 85	18th / 16th / 16th	
	• Arithmetic (WRAT)	81 / 80 / 81	10th / 9th / 10th	
	• Verbal (IQ–WAIS)	93 / 92 / 93	–a value of 100 would be considered "average"	
Brantner, S. F. and Enderlein, T. E. (1972)		*Groups (all dropouts)* *Vocational* (n=36): *Mean* / *S.D.* *Non-Vocational* (n=30): *Mean* / *S.D.*	*Related Percentiles* *Vocational* / *Non-Vocational*	The results of this study suggest (1) potential dropouts' scores are at about the 40th percentile on national norms, and (2) their performance on math-related items is slightly higher than their performance in the verbal area.
	• Verbal (GATB)	85.3 / 7.5 / 88.2 / 8.3	33rd / 38th	
	• Numerical (GATB)	88.2 / 10.0 / 94.2 / 12.1	40th / 52nd	
	• Verbal (APT)	23.2 / 14.9 / 32.7 / 22.7	– / –	
	• Non-Verbal (APT)	35.8 / 24.0 / 34.4 / 23.7	– / –	
Combs, J. and Cooley, H. H. (1968)		*Mean* / *S.D. (pooled)*		The results reported for this study suggest that (1) potential dropouts are probably near the 30th percentile in their basic skills attainment, and (2) their overall English and math computation skills are somewhat lower than their reading and arithmetic reasoning skills.
	• English – Total	68.5 / 13.2	– 25th percentile, .55 S.D. below est. pop. mean	
	• Reading Comprehension	20.3 / 9.8	– 35th percentile, .50 S.D. below est. pop. mean	
	• Introductory High School Math	7.2 / 3.5	– 35th percentile, .50 S.D. below est. pop. mean	
	• Arithmetic Reasoning	5.8 / 3.0	– 40th percentile, .40 S.D. below est. pop. mean	
	• Arithmetic Computation	13.6 / 26.1	– 20th percentile, .40 S.D. below est. pop. mean	
Crawford, J. (1964)		*Mean (Grade Equivalents)* / *S.D.*		The results of this study show that potential dropouts' reading performance is well below grade level.
	• Reading	4.4 / 1.3	– approximately 6 to 8 years below actual grade level.	

TABLE 10 (continued)

Source	Basic Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Custer, H. F., Jr. (1973)		*Statistics (Percentile Ranks)* *Grade 7* — *Mean* / *S.D.*; *Grade 9* — *Mean* / *S.D.*	(Reflected in the reported means.)	The results reported for this study suggest that potential dropouts are scoring at about the 25th percentile in both reading and math.
	• Mathematics (SAT)	26.3 / 21.1 / 23.8 / 19.6		
	• Reading (SAT)	25.9 / 13.4 / 24.4 / 17.2		
Dickerson, E. (1973)		*Mean (Grade Equivalents)* / *S.D.*	– approximately 7 to 9 years below actual grade level in school.	The results obtained in this study suggest (1) potential dropouts scored considerably below grade level on all the basic skills indicators and (2) they scored about equally poorly in reading, arithmetic, and language.
	• Reading (CAT)	3.6 / 1.2		
	• Arithmetic (CAT)	4.0 / 0.9		
	• Language (CAT)	3.4 / 1.2		
	• Reading (GMRT)	3.8 / 1.1		
Johnson, L. (1973)		*Mean* / *Median*	– 18th percentile on national norms – equal to 26th percentile } on Minneapolis City norms – equal to 28th percentile } on Minneapolis City norms – 12th percentile on national norms	The results presented in this study suggest that (1) potential dropouts score well below the 25th percentile on basic skills measures (national norms) and (2) their numerical/arithmetic performance is about as high as their verbal/reading performance.
	• Verbal (DAT)	/ 11.7		
	• Numerical (DAT)	/ 10.3		
	• Reading (STEP)	438.6	– Equal to 11th percentile } on national norms	
	• English Expression (STEP)	432.0	– Equal to 13th percentile } on national norms	
Jones, H. B. (1973)		*(Reported averages are pooled across 3 schools)*	*Percentile*	The results of this study suggest that the sample of potential/actual dropouts scored at about the 30th percentile on reading and 10th percentile in mathematics.
	• Reading (WRAT)	Mean = 92.5	31st	
	• Mathematics (WRAT)	Mean = 81.3	10th	
	• Verbal (FAS)	Mean = 70.5	–	
	• Numerical (FAS)	Mean = 49.8	–	
Kelly, F. J. and others (1964)	• Listening (STEP)	Mean=264.4	–	These results suggest the sample of potential dropouts' basic language scores are very, very low.
	• Language (CTMM)	Mean = 28.4	6th	
Langsdorf, M. and Gibboney, R. A. (1971)		*Mean (Percentile Rank)* / *Mean (Grade Equiv.)* / *Percent Below 8th Grade*	approximately 3 to 5 years below actual grade level	The results reported in this study suggest that (1) the students were scoring somewhere near the 25th percentile on the various criteria, and (2) their reading performance was slightly higher than their math performance.
	• Reading (SAT)	34 / 7.2 / 73%		
	• Mathematics (SAT)	19 / 7.3 / 63%		

TABLE 10 (continued)

Source	Basic Skill(s)	Statistics	Related Standard(s)	Summary Interpretation(s)
Center for Field Research and School Services (1973)	• Reading • Mathematics	*Mean (Grade Equivalents)* / *S.D.* 6.9 / 2.6 5.8 / 2.6	approximately 5 to 7 years below actual grade level	Based on these results, it would appear (1) the potential dropouts' basic skills attainments are well below expectation given their grade levels, and (2) their reading skills are slightly higher than their math skills.
Sharar, P. H. (1974)	• Reading	*Program Group* Mean 6.7, S.D. 1.8; *Comparison Group* Mean 6.1, S.D. 2.0	4 to 6 years below actual grade level	The results of this study suggest the sample of dropouts are scoring well below grade level.
Spotts, R. and others (1978)	• Reading • Mathematics	*Mean* / *S.D.* 48.4 / 8.9 42.4 / 12.6	– –	The results presented in this study suggest (1) the students' basic skills are slightly below average, and (2) their reading attainment is slightly higher than their math attainment.
Stein, E. M. and others (1976)	• Mathematics • Reading Recognition • Reading Comprehension	*Mean* / *S.D.* 5.4 / 2.1 5.3 / 2.3 5.6 / 2.3	approximately 5 to 9 years below actual grade level	The results presented in this study suggest (1) the students' basic skills levels are considerably below grade level, and (2) their reading recognition and math skills are about equal, but both are slightly lower than their reading comprehension skills.
Walther, R. H. and Magnusson, M. L. (1975)	• Reading (SAT) • Mathematics (SAT)	*Group Means (In Grade Equivalents)* *High School Dropouts*: (1) *Detention Center*; (2) *Youth Corps Site 1*; (3) *Youth Corps Site 2* *Potential Dropouts*: (4) *H.S. Dropouts* 6.2, 6.7, 8.1, 5.4 5.5, 5.7, 6.7, 5.5	approximately 2 to 7 years below actual grade levels	The results from this study suggest (1) overall, the basic skills of the tested clients were well below normal, and (2) their math performance was typically lower than their reading performance.
Droege, R. C. (1968)	• Verbal aptitude • Numerical aptitude	*Grade Level* / *Male Mean* / *Male S.D.* / *Female Mean* / *Female S.D.* 9th 84.9 10.1 87.8 10.2 10th 89.3 11.2 91.3 11.5 11th 92.4 11.8 96.6 13.0 9th 86.5 14.5 90.7 15.1 10th 90.2 14.6 93.3 15.6 11th 93.2 14.8 94.9 15.5	*Grade Level* / *Related Percentiles Male* / *Female* 9th 33rd 38th 10th 34th 37th 11th 35th 43rd 9th 37th 44th 10th 40th 48th 11th 47th 40th	The results presented in this study suggest (1) the overall basic skills attainment of the sampled students is below average (i.e., it is at approximately the 40th percentile), and (2) their numerical/math performance is slightly higher than their verbal performance.

available regarding the other basic skills areas is too limited to warrant any conclusions at this time and merits further inquiry.

- The basic skills performance of potential and actual dropouts across the different basic skills areas appears comparable--they are generally both equally poor.

The primary question related to the second issue was, "How do the basic skills levels of secondary school dropouts compare with those of completers or graduates?" Several ancillary concerns were, "Are the differences in basic skills observed for female dropouts and completers similar to the related differences observed for males?"; "Do the differences between dropouts and completers vary across basic skills?" and "Are the differences between dropouts and completers who are enrolled in vocational programs comparable to the related differences between dropouts and completers in other curricula?" The empirical results related to these questions are summarized in table 11.

The information presented in table 11 suggests the following:

- The basic skills levels of students who drop out of high school are usually significantly lower than the basic skills levels of completers or graduates. Generally, the average scores observed for dropouts are about half a standard deviation unit less than the average scores observed for graduates.
- Although only one study yielded data regarding the issue, the results reported in that study indicate that the dif-

TABLE 11

Overview of Analyses Comparing the Basic Skills of Secondary School Dropouts and Completors

Source	Basic Skill(s)	Statistics: a) Descriptive				Statistics: b) Inferential		Summary Interpretations
Brantner, S. J. and Enderlein, T. E. (1972)		*Voc. Completor (VC)*	*Voc. Dropout (VD)*	*Nonvoc. Completor (NC)*	*Nonvoc. Dropout (ND)*	*F-Values*	*Results of Related Comparisons*	The following outcomes are suggested by these results: (1) the basic skills of the vocational completors are more like the basic skills of the nonvocational completors or the vocational dropouts; (2) the dropouts' scores (vocational and nonvocational) are about ½ standard deviation below those of the completors; and (3) the vocational dropouts' scores on three of the four criteria are about ½ standard deviation below those of the nonvocational dropouts.
	• Verbal (GATB)	92.0	85.3	95.3	88.2	17.2**	NC > VC ≅ ND > VD	
	• Numerical (GATB)	95.3	88.2	99.2	94.2	12.8**	NC > VC ≅ ND > VD	
	• Verbal (APT)	37.5	23.2	48.1	32.7	10.9**	NC > VC ≅ ND > VD	
	• Nonverbal (APT)	49.2	35.8	54.8	34.4	22.1**	NC > VC > ND ≅ VD	
						where **: significant at α = .01 level; ≅: "approximately equal to" or "no significant difference between"		
Combs, J. and Cooley, W. W. (1968)		*Mean Scores*				*F-Values*		The results suggest that (1) the dropouts scored about .45 standard deviation below the control students (who completed high school but did not go on to postsecondary education) on all of the basic skills criteria, and (2) the differences between the two groups (i.e., dropouts and "controls") were basically the same for males and females.
		Males		*Females*				
		Dropouts	*"Controls"*	*Dropouts*	*"Controls"*	*Males*	*Females*	
	• English — Total	63.9	71.5	72.9	79.3	255**	220**	
	• Reading Comprehension	19.0	23.5	21.5	25.8	167**	176**	
	• Intro. High School Math	7.0	8.5	7.3	9.1	156**	241**	
	• Arithmetic Reasoning	5.9	7.0	5.7	6.9	114**	134**	
	• Arithmetic Computation	9.0	19.8	18.2	27.6	110**	144**	
						where **: significant at α = .01		
Evans, R. E. and Patrick, C. (1971)		*Mean Scores*				*t-Values*		These results suggest that (1) the basic skills levels of high school dropouts are on the average about 2/3 standard deviation below those of completors, (2) the greatest difference between the two groups is in the area of writing, and (3) the smallest difference (although still significant) is in the area of listening.
		Dropouts (D)		*Nondropouts (ND)*				
	• Verbal (SCAT)	242.5		248.3		3.5**		
	• Quantitative (SCAT)	251.4		256.3		3.8**		
	• Mathematics (STEP)	239.5		245.1		3.6**		
	• Reading (STEP)	246.4		255.7		4.1**		
	• Listening (STEP)	260.3		265.6		2.9*		
	• Writing (STEP)	244.9		255.1		4.8**		
						where *: significant at α = .05; **: significant at α = .01		

TABLE 11 (continued)

Source	Basic Ski. .s)	Statistics a) Descriptive			b) Inferential	Summary Interpretations
Kelly, F. J. and others (1964)		*Mean Scores*				These results suggest that (1) the basic skills levels of high school dropouts are on the average about 2/3 standard deviation below those of completors, (2) the greatest difference between the two groups is in the area of writing, and (3) the smallest difference (although still significant) is in the area of listening.
		Delin-quents	*Drop-outs*	*Com-pletors*	*F-Values*	
	• Listening	265.6	264.4	274.6	2.3	
	• Language (CTMM)	29.9	28.4	32.4	9.[illegible]**	
					where **: significant at α = .01	
Droege, R. C. (1968)		*Mean Scores*				The results suggest that (1) the verbal and numerical aptitude scores of high school dropouts are on the average about 2/3 of standard deviation below those of completors, and (2) the differences in aptitudes between the two groups decrease with increases in grade level (from ¾ to ½ standard deviation at grades 9 and 11).
		Grade Level	*Drop-outs*	*Gradu-ates*	*Differ-ence*	
	• Verbal Aptitude (GATB)	9th	86.3	94.4	8.1	Although no test statistics are presented, it is noted that all 3 differences are significant at α = .01 level.
		10th	90.3	98.3	8.0	
		11th	94.5	100.8	6.4	
	• Numerical Aptitude (GATB)	9th	88.6	98.9	10.3	Although no test statistics are presented, it is noted that all 3 differences are significant at α = .01 level.
		10th	91.7	100.6	8.8	
		11th	94.1	102.9	8.9	

ferences between the basic skills levels of dropouts as compared to completers were approximately the same for females and males. That is, female dropouts scored about half a standard deviation less than female completers on the various basic skills measures employed in the study, which paralleled the findings observed for males.

- The differences between the reading or verbal and mathematics or quantitative skills of dropouts and completers appear to be approximately the same--about half a standard deviation lower for dropouts. The information available regarding other basic skills areas (e.g., listening and writing) is too limited to warrant a conclusion at this time and represents a topic that should be researched further.
- Of all the studies reviewed, only one yielded data dealing with the basic skills of both vocational and nonvocational dropouts and graduates. The results reported in that study suggest that the basic skills levels of vocational completers are more like the basic skills levels of nonvocational dropouts while the basic skills levels of vocational dropouts are considerably lower. Since the sample upon which these results are based was restricted, these results need to be replicated in other settings using other samples before any firm generalization can be made.

The third issue addressed through the empirical results of the studies was, "Is exposure to a vocationally-oriented program related to changes in the basic skills levels of actual and potential secondary school dropouts?" Two ancillary questions were, "Of what magnitude were the observed changes in the dropouts' basic skills levels?" and "Were the observed changes comparable across basic skills areas?" Table 12 provides an overview of the specific findings related to these questions. The information summarized in table 12 suggests the following:

- Usually, the basic skills levels of potential and actual secondary school dropouts will increase substantially when they are provided an opportunity to participate in a vocationally-oriented program that has an explicit integrated basic skills component. Although two of the reported studies (out of a total of eleven) did not yield information that unequivocally supported this conclusion, in both instances the nature and quality of the reported program and related data were questionable. Furthermore, they serve to indicate that such improvements cannot be assumed to occur in all settings and circumstances, but rather that they represent outcomes that must be pursued and are based upon overall program quality, including the criteria employed.
- The observed changes in dropouts' basic skills levels averaged half a standard deviation unit higher. Even with these improvements, however, the affected students' levels of performance were still usually well below

TABLE 12

Overview of Studies Focusing upon Changes in the Basic Skills Levels of Potential/Actual Secondary School Dropouts

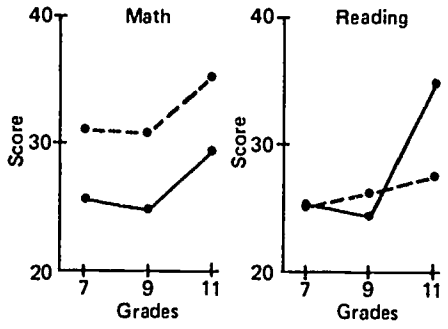
Source	Basic Skill(s)	Statistics a) Descriptive	Statistics b) Inferential	Summary Interpretations
Austin, J. J. and Sommerfeld, D. A. (1967)	• Reading (WRAT) • Arithmetic (WRAT) • Verbal	*Program (X)* / *Pre (X1)* / *Post (X2)* / *Program (Y)* / *Pre (Y1)* / *Post (Y2)* 85.4 / 89.6 / 84.7 / 85.3 80.8 / 88.8 / 99.7 / 80.2 93.3 / 96.4 / 91.3 / 92.6	*t-Values* / *T(1)* / *T(2)* / *T(3)* / *T(4)* -2.6** / -.3 / .4 / 2.2* -6.7** / -.3 / .9 / 6.3** -2.4** / -.7 / 1.3 / 2.4* Where: T(1) = X1 vs. X2 T(2) = Y1 vs. Y2 T(3) = X1 vs. Y1 T(4) = X2 vs. Y2 and *: significant at α = .05 with **: significant at α = .01	The results reported in this study suggest that (1) the basic skills levels of the program participants increased significantly more than those of the control subjects, and (2) the increase in the program students' mathematics scores was about 2/3 of a standard deviation, while the increase in their reading scores was about 1/3 of a standard deviation.
Crawford, J. (1974)	• Reading	*Grade Level* / *Pre* / *Post* / *Change* 8.0 & above / 1% / 1% / 0% 6.0 to 7.9 / 5% / 35% / +30% 4.0 to 5.9 / 54% / 49% / -5% 2.0 to 3.9 / 40% / 15% / -25%	*X^2-Value* 197.08** **: significant at α = .01	The results reported for this study suggest that the reading levels of the program students did increase significantly, but that there was still considerable room for improvement, i.e., at the time of the posttest only 36% of the high school students sampled exhibited reading scores at or above the 6th grade level.
Custer, H. F. (1973)	• Mathematics (SAT) • Reading (SAT)	*Mean Scores* *Program* / *7th* / *9th* / *11th* / *Control* / *7th* / *9th* / *11th* 26.3 / 23.8 / 29.9 / 31.1 / 30.9 / 35.6 25.9 / 24.4 / 34.8 / 25.6 / 26.9 / 27.6 *Graphs of Mean Scores:*  	*Multivariate F-Values* F (between groups) = .77 F (grades) = 4.63** F (Interaction/Change across groups) = 11.5** where **: significant at α = .01	The results from this study, although based on a very restricted sample, suggest that (1) the program students' math and reading skills decreased somewhat between 7th and 9th grades, while those of the control students increased slightly, (2) the program students' math and reading skills increased significantly more between 9th and 11th grades than did the comparable scores for the control students, and (3) the increase in the program students' math scores from 9th to 11th grades was about 1.2 standard deviations, while the increase in their reading scores was about 0.9 standard deviation.

TABLE 12 (continued)

Source	Basic Skill(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretations
Dickerson, E. (1973)		Pre Mean / Pre S.D. / Post Mean / Post S.D.	F-Values	The results suggest that during the project period the students' basic skills scores increased significantly. More specifically, over the span of an academic year their reading scores increased by about .8 of a standard deviation, their math scores by 1 standard deviation, and their language scores by .7 of a standard deviation. However, their average performance levels on the respective posttests were still considerably below the 8th grade or high school levels.
	• Reading (CTBS)	3.6 / 1.2 / 4.6 / 1.2	22.5**	
	• Arithmetic (CTBS)	4.0 / .9 / 5.0 / 1.2	21.4**	
	• Language (CTBS)	3.4 / 1.2 / 4.4 / 1.6	14.3**	
			where **: significant at α = .01	
		Length of Time in Program / Means: Pre / Post	t-Values	
	• Reading (GMRT)	1 year (n_1=12) / 4.0 / 5.0	2.3*	
		2 years (n_2= 4) / 3.3 / 3.9	2.5*	
		3 years (n_3=26) / 3.8 / 6.2	4.9*	
			* It is stated in the report that all three t-values are significant at α = .05	
Johnson, L. (1973)		Pre / Post / Gain	No inferential statistics were reported regarding the designated gains in basic skills levels.	The results of this study suggest that the affected students' basic skills scores did not increase between pre- and post-testing. Furthermore, the percentile equivalents of 9 and 15 reported for the posttests show that those scores remained at a very low level.
	• Reading (STEP)	Mean Scores: 459 / 444 / +5; Percentiles: 11 / 9 / -2		
	• English Expression (STEP)	Mean Scores: 432 / 435 / +3; Percentiles: 13 / 15 / +2		
Jones, H. B. (1973)		Mean Scores: Site / Pre* / Post* / Gain*	t-Values	The results of this study are equivocal in that negative changes between pre- and posttesting were noted on two of the basic skills criteria, while positive changes were noted on two others. One interesting point is that the negative changes were observed on an "academically oriented" basic skills measure, while the positive changes were observed on an orally administered measure that emphasizes practical, occupationally relevant skills/behaviors.
	• Reading (WRAT)	E: 95 / 95 / -.6	(not reported) – Not significant	
		W: 95 / 90 / -2.4	(not reported) – Not significant	
		C: 85 / 90 / -4.0	(not reported) – Not significant	
	• Arithmetic (WRAT)	E: 84 / 84 / 0	(not reported) – Not significant	
		W: 82 / 66 / -12.3	**: significant at α = .05	
		C: 77 / 76 / -2.8	(not reported) – Not significant	
	• Verbal (FAS)	E: 75 / 79 / 6.2	(not reported) – Not significant	
		W: 75 / 76 / 5.0	**: significant at α = .05	
		C: 62 / 69 / 4.1	**: significant at α = .05	
	• Numerical (FAS)	E: 61 / 51 / 1.3	(not reported) – Not significant	
		W: 47 / 47 / 2.0	(not reported) – Not significant	
		C: 37 / 42 / 3.2	(not reported) – Not significant	
		*The numbers of students upon whom the gain scores are based are not equal to the numbers who completed either the pre- or the posttests.	**The actual t-values were not reported for this study. Also, it was implied that those for which significance were not noted were found to be "not significant."	

TABLE 12 (continued)

Source	Basic Skill(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretations
Langsdorf, M. and Gibboney, R. A. (1977)	• Reading (SAT) • Math (SAT)	*Average Gain Scores:* *Groups* — *Raw Score* — *Gr. Equiv.* "Interns" +3 +5 "Control" 0 0.0 "Interns" +1 +.4 "Control" −1 −.1 *Below 8th Grade in—* — *Interns Pre* — *Interns Post* — *Controls Pre* — *Controls Post* Reading 73% 58% 69% 69% Math 65% 57% 69% 70%	Significant difference noted, but no statistics were presented. Significant difference noted, but no statistics were presented. No inferential statistics were reported regarding these data.	The results presented in the study suggest that (1) the basic skills levels of the program students ("interns") increased significantly more than those of the control students between the administration of the pre- and posttests. Furthermore, it appears that the improvements in both reading and math were comparable. Even with the program students' improvement, however, over half of them are still scoring below an 8th-grade level.
Center for Field Research and School Services (1973)	• Reading (CAT) • Mathematics (CAT)	*Pre* Mean S.D. — *Post* Mean S.D. 6.9 2.6 8.1 2.5 5.8 2.6 6.5 2.4	*t-Values* 8.3** 8.1** **: significant at $\alpha = .01$	The results presently suggest that the basic skills of the affected students increased significantly during the course of the study—their reading increased by ½ of a standard deviation and their math increased by .3 of a standard deviation.
Spotts, R. and others (1978)	• Reading (SRA) • Math (SRA)	*Gains:* *Groups* — *Mean* — *S.D.* 2 years 1.8 6.7 1 year 2.0 4.8 Comparison 0.1 4.2 2 years 4.2 9.9 1 year 3.9 7.1 Comparison 1.0 6.1	*t-Values* 1.1 2.1* .2 1.8 2.9** .8 where *: significant at $\alpha = .05$ and **: significant at $\alpha = .01$	The results of this study suggest that (1) the program students' basic skills (particularly those of the students who were in the program for one year) increased more than the scores of the control students, and (2) the program students' math scores increased by about ½ of a standard deviation, while their reading scores increased by about 1/3 of a standard deviation.
Stein, E. M. and others (1976)	• Math • Reading Recognition • Reading Comprehension	*Mean Scores:* *Pre* — *Post* 5.4 7.6 5.3 7.1 5.6 7.2	*t-tests* t-value reported as significant at $\alpha = .01$ t-value reported as significant at $\alpha = .01$ t-value reported as significant at $\alpha = .01$	The results presented in this study suggest that the affected students' basic skills levels increased significantly between pre- and posttesting. They also suggest that the increase in the students' math skills was somewhat greater than the increases in their reading recognition and reading comprehension skills.

TABLE 12 (continued)

Source	Basic Skill(s)	Statistics a) Descriptive			b) Inferential	Summary Interpretations
Walther, P. H. and Magnusson, M. L. (1975)		*Test Times:* *				The results reported suggest that the basic skills levels of subjects in both sites increased substantially over the course of the study, particularly during the three-month interval between the pretest and initial retest. The increases observed in reading and math scores were approximately equal in magnitude.
		Site	(T1) *Retest 1*	(T2) *Retest 2*	(T3) *Retest 3*	*t-tests*
	• Reading (SAT)	S	8.1	9.2	9.6	Changes from T1 to T2 both significant at $\alpha = .01$; T2 to T3 tests not reported.
		LB	6.7	7.4	8.0	
	• Mathematics (SAT)	S	6.7	7.7	8.3	Changes from T1 to T2 both significant at $\alpha = .01$; T2 to T3 tests not reported.
		LB	5.7	6.4	7.1	
		* The differences between the indicated times are each approximately 3 months.				

either the high school or the eighth grade level, which is considered by many educators as the minimal level of competency needed to function effectively in today's society. Therefore, additional research and program development activities should be undertaken to improve the potential of programs designed to sustain growth in affected students' basic skills levels.

- Most studies reported positive change in both the reading and mathematics skills of affected students. In most cases, the students' mathematics scores increased as much as or slightly more than their reading or verbal scores.

The fourth issue addressed was, "How is dropping out of school related to selected vocational education outcomes such as employment, earnings, skill level requirements of jobs, and the acquisition of additional training?" The available results related to this issue are few and fragmented. Table 13 provides an overview of those results.

The information presented in table 13 suggests the following:

- In those instances where no specialized vocational training was provided as part of the study (i.e., in those instances where the subjects are simply "tracked" over some specified period of time), the results were generally equivocal and inconclusive. For example, in one study (Combs and Cooley 1968), it was found that the average annual earnings of dropouts (one year after the twelfth grade) were slightly higher than those of high

TABLE 13

Reported Relationships Between Related "Vocational Education Outcomes" and Dropping Out of School

Austin, J. J. and Sommerfeld, D. L. (1967)

Outcome(s): Employed at time of follow-up; Average wage (for those employed); Average wage (entire group); Skill level of job

Statistics — a) Descriptive

Level of Job	Program Pre	Program Post	Control Pre	Control Post
	42%	66%	43%	55%
	$1.26	$1.79	$1.36	$1.82
	$ .53	$1.19	$ .58	$1.00
Unskilled	78%	40%	86%	46%
Semi-skilled	22%	50%	14%	50%
Skilled	0%	10%	0%	4%

Statistics — b) Inferential: For all four outcomes, no statistical tests were reported.

Summary Interpretations: The results reported in this study suggest that both the employment rate and average wage earned by the program participants (as a group) are greater than those of the control subjects, but that there was not much of a difference between the groups with regard to average earnings (just for those who were employed) or in the levels of the jobs they held.

Redfering, D. L. and Cook, D. (1980)

Outcome(s): Mean annual income; Mean job complexity

Statistics — a) Descriptive

	Dropouts Mean	Dropouts S.D.	Graduates Mean	Graduates S.D.	t-Values
Mean annual income	$5,418	$1,918	$5,771	$2,644	2.77**
Mean job complexity	17.7	2.7	16.5	4.0	5.33**

Statistics — b) Inferential: where **: significant at $\alpha = .01$

Summary Interpretations: The data presented in this study suggests that high school dropouts have a significantly lower annual income and secure less complex jobs than do high school graduates.

Gharar, P. H. (1974)

Outcome(s): No. of weeks worked (in a year); Weeks spent in additional training; Weeks spent in military; No. of weeks unemployed; No. of jobs held (in a year); Longest job (in weeks); Average weekly pay (while working); Highest weekly pay; Annual income

Statistics — a) Descriptive

	"Experimental" Mean	"Experimental" S.D.	Control Mean	Control S.D.	t-Values
No. of weeks worked (in a year)	43.1	14.1	16.6	18.7	6.0**
Weeks spent in additional training	2.5	8.1	.6	3.0	1.2
Weeks spent in military	.8	4.2	3.6	13.1	1.1
No. of weeks unemployed	4.8	7.8	21.9	20.6	4.1**
No. of jobs held (in a year)	2.3	1.6	1.1	1.2	3.2**
Longest job (in weeks)	34.0	16.2	14.5	19.8	4.8**
Average weekly pay (while working)	$ 101	$ 19.2	$ 19	$ 15.6	3.2**
Highest weekly pay	$ 108	$ 20.4	$ 80	$ 15.8	4.4**
Annual income	$1,777	$1323.	$2,237	$2006.	4.7**

Statistics — b) Inferential: where **: significant at $\alpha = .01$

Summary Interpretations: The results from this study suggest that those subjects who completed the program (1) worked for more weeks (in a follow-up year), (2) were unemployed less time, (3) held more jobs (on the average), (4) tended to hold their jobs longer, and (5) earned substantially more money than those subjects who were included in the control group. Basically no differences were observed between the two groups with regard to weeks spent in additional training or weeks spent in the military.

TABLE 13 (continued)

Source	Outcome(s)	Statistics: a) Descriptive	Statistics: b) Inferential	Summary Interpretations
Hornbostel, V. D. and others (1967)	• Employed (at points of follow-up)	*Group** / *At 12 months* / *At 24 months* VA: 61% / 52% V: 71% / 73% A: 58% / 48% C: 33% / 36%	No statistical tests reported.	The results from this study suggest that (1) the employment rate for those subjects who completed the "vocational" program was somewhat higher than the employment rate for those who completed the "academic" or no program; (2) the duration of employment and average annual earnings of those subjects who completed the "vocational" program were significantly greater than those of the control subjects; and (3) there were no major differences observed among the groups with regard to hourly rate of pay, job satisfaction, or employer ratings.
	• Weeks of employment per year	*Group* / *12 mo.* / *24 mo.* / *12 mo.* / *24 mo.* VA: 26 / 44 / 23 / 23 V: 32 / 49 / 23 / 32 A: 20 / 43 / 18 / 27 C: 9 / 36 / 7 / 13	The results of follow-up tests showed that at 12 months VA ≅ V > C for males and females, but all differences were "wiped out" by the 24th month.	
	• Hourly rate of pay	*Group* / *Males 12 mo.* / *Males 24 mo.* / *Females 12 mo.* / *Females 24 mo.* VA: $1.72 / $1.86 / $1.44 / $1.60 V: 1.64 / 1.98 / 1.23 / 1.53 A: 1.96 / 3.25 / 1.25 / 1.35 C: 1.20 / 1.94 / 1.16 / 1.26	No significant differences were observed.	*The designated groups are: VA: Vocational–Academic combined V: Vocational only A: Academic only C: Control
	• Average annual earnings	VA: $2,379 / $3,180 / $1,250 / $1,458 V: 2,551 / 3,470 / 1,077 / 1,638 A: 2,222 / 4,069 / 771 / 1,431 C: 762 / 2,675 / 316 / 762	At 12 month VA ≅ V > C for both males and females, but all differences were "wiped out" by the end of the 24th month.	
	• Job satisfaction	VA: 61.2 / 58.8 / 64.5 / 70.6 V: 61.1 / 55.2 / 66.9 / 67.1 A: 52.2 / 56.4 / 51.5 / 59.1 C: 52.0 / 57.0 / 59.1 / 48.7	No significant differences were observed.	
	• Employer ratings	VA: 37.0 / 39.2 V: 37.0 / 44.0 A: 37.7 / 37.6 C: 27.6 / 30.8	No significant differences were observed.	
Combs, J. and Cooley, W. W. (1968)	• Employment rate (what would "normally" have been 1 year after high school graduation)	*Dropouts*: 90% / *Controls*: 91%	No statistical tests reported.	The data reported in this study do not suggest that there are any major or substantial differences between the samples of dropouts and control students on the designated criteria. Although there are slight differences between them, those differences appear to be unsystematic, if not equivocal.
	• Annual salary (for those employed)	$3,650 / $3,500	No statistical tests reported.	
	• Post high school training – trade school – technical school	7% / 4% .7% / 5%	No statistical tests reported.	
	• Active military duty	30% / 33%	No statistical tests reported.	

school graduates who did not go on to college, while in another (Redfering and Cook 1980), it was found that the annual earnings of dropouts were significantly lower than those of high school graduates (twenty years after the tenth grade).

- In those instances where some specialized vocational training was provided to dropouts, the results are somewhat more conclusive and interpretable. They suggest that dropouts who receive vocational training generally experience higher employment rates and higher average annual earnings than dropouts who do not receive such training.

With regard to the other outcomes mentioned (e.g., acquisition of additional training and skill level requirements of jobs), few if any data were available. The scarcity of specific data as well as the general paucity of information in this area suggest that additional research should be conducted to increase the data base if the question of outcomes is to be evaluated adequately.

An Overview of of Programs Designed to Foster the Basic Skills of Dropouts

In addition to the nineteen studies with empirical findings, a number of others were culled for information about specific techniques currently in use in different settings to incorporate and improve basic skills instruction for dropouts and potential dropouts in vocational education. The purpose of this effort was to provide ideas on and insights to what is currently being done

or what might be done to improve the basic skills attainment of both potential and actual dropouts. The results should be a useful source of information for educational decision-makers, researchers, and practitioners who are engaged in program planning and operations in vocational education.

The strategies and techniques from the studies mentioned above have been abstracted and organized according to a conceptual model for describing instructional programs developed by Stufflebeam (1971). That information (programs for actual and potential dropouts are described separately) is summarized in Appendices F-1 and F-2.

The information contained in Appendix F-1 suggests that programs designed to serve actual dropouts are generally characterized by the following:

- Content
  - A listing of both general and specific objectives for basic skills training courses or vocational training courses with a basic skills component
  - Use of norm-referenced tests to evaluate skill levels and to measure student progress after basic skills instruction. Instructional staff usually administer a battery of commercially-available instruments
- Methodology
  - Integrated programs that combine basic skills instruction with vocational training or career exploration activities that prepare students for

specific employment, simultaneously increasing their basic skills attainment levels

- Nonintegrated programs predicated on remediation of basic skills deficiencies generally through individualized instruction provided on an as-needed basis
- Instructional modes or methods that entail intensive and, most frequently, individualized instruction in reading, writing, speaking, and computation that allows for each student's unique learning rate and style. In some cases, vocational course content and basic skills course content are meshed to provide students with a sense of continuity in the vocational program
- Interaction of learner characteristics with techniques of program delivery that is generally favorable to successful experiences in the classroom not previously enjoyed by students
- The use of commercially available materials supplemented by teacher-made materials or teacher-made materials supplemented by commercially available audiovisual materials. Often both approaches are employed in a learning laboratory setting

- Organization
  - Use of both academic and vocational instructors to diagnose basic skills deficiencies, to provide basic skills and vocational instruction, and to provide related services as needed

- Programs of four to nine months duration with varying numbers of hours devoted to basic skills instruction, vocational training, or both
- In-school locus or separate facilities within a local school district depending upon type and duration of program

The information presented in Appendix F-2 suggests that programs designed to serve potential dropouts are generally characterized by the following:

- Content
  - A listing of both general and specific objectives for basic skills training in concert with vocational education, with particular attention to attitudinal improvement for dropout prevention
  - Use of norm-referenced tests to evaluate skill levels and to measure student progess after basic skills instruction. Staff administer a battery of commercially available instruments
- Methodology
  - Integrated programs in which vocational instruction in various occupational areas is combined with compensatory instruction in the various basic skills
  - Nonintegrated programs predicated on remediation of basic skills deficiencies as well as attitudinal and behavioral problems

- Individualized attention and instruction provided on an open-entry/open-exit basis, often in combination with a work/study plan
- Instructional modes or methods that allow curriculum to be tailored to meet specific student needs and to reflect occupational requirements whenever possible. Frequently, basic skills course content is closely related to work-related concepts that can be applied both in the classroom and at work
- Interaction of learner characteristics with techniques of program delivery that emphasizes improving self-image to prevent dropping out through positive affective change
- Use of commercially available materials adapted by teachers to respond specifically to individual students' needs. These materials are usually supplemented by teacher-prepared instructional units, audiovisual aids, and the like. All materials are most frequently used in a learning laboratory setting

- Organization
  - Use of both academic and vocational instructors to diagnose basic skills deficiencies and to provide basic skills and vocational instruction. In addition, counselors, psychologists, and other staff provide assistance with behavioral and attitudinal adjustment. All personnel are selected for their

stability, flexibility, and empathy in dealing with the problems of the potential dropout

- Program duration of one academic year with varying numbers of hours devoted to basic skills instruction, vocational training, or both
- In-school locus, but generally a separate facility within the school plant. Size of facility depends on number of students served and on program duration

Conclusions and Recommendations

The empirical results obtained from the review of the various studies that dealt with the problem of dropouts prompted a number of conclusions related to the second project objective cited in the Introduction. These conclusions are summarized in figure 7.

The findings presented in figure 7 and the information from the literature on specific techniques for improving the basic skills of dropouts led to the following operational and developmental recommendations for improving the instructional programming afforded such students.

- Content Considerations
  - Explicate the goals and specific objectives for the basic skills, vocational training, or career education components of any program for actual or potential dropouts, to provide a framework and structure for instruction. Too frequently, the dropout or dropout-prone student is plagued by self-doubts and

FIGURE 7

Summary of the Major Conclusions Drawn from the (19) Reviewed Studies

ISSUE		RELATED CONCLUSIONS	
1.	What levels of basic skills attainment are exhibited by (both potential and actual) secondary school dropouts?	1.1.	The basic skills levels of potential and actual school dropouts are well below average and expected grade level. Across the various basic skills areas they tend to score at or near the 25th percentile or at a grade equivalent of 5.4.
		1.2.	Their performance in the reading (verbal) and mathematics (numerical) areas appear to be equally poor. (The lack of data regarding other basic skills indicates an area where additional research needs to be conducted.)
2.	How do the basic skills levels of secondary school dropouts compare with those of completers?	2.1.	The basic skills levels of students who drop out of high school are usually significantly lower than the basic skills levels of those who graduate. The average performance observed for dropouts is typically about half a standard deviation lower than the average observed for completers, regardless of the basic skills areas under consideration.
		2.2.	The differences between dropouts and completers across both verbal/reading and numberical/math criterion measures are almost equal (i.e., about 1/2 standard deviation unit). (No information was available for estimating comparable differences across other basic skills areas—a void that represents an area that should be studied further.)
3.	What changes, if any, are observed on the basic skills levels of potential and actual dropouts who are afforded the opportunity to participate in some form of basic skills–vocational educational program?	3.1.	When potential and actual dropouts are provided the opportunity to participate in a vocationally oriented program that has an integrated basic skills component, their basic skills attainments will usually increase substantially. (Across these reviewed studies that increase was about half of a standard deviation unit.) In most instances, however, their performance is still below either the high school or the 8th grade level, which suggests that there is considerable room for improvement in the programs being offered.
		3.2.	The reading and math performance of affected students both exhibited positive changes/increases when they were addressed by the respective programs.
4.	What relationships exist between selected "vocational education outcomes" (like earnings, employment, etc.) and dropping out of school?	4.1.	The available data regarding this issue is much too scant to reach any firm conclusions. (However, the results of several studies in which vocational programs were provided, tentatively suggest that the dropouts who participate in those programs may experience higher employment rates and average annual earnings than dropouts who do not participate in those programs. This represents another area that needs to be researched more extensively.

insecurity resulting from weak or absent structures both at home and at school. Goals and objectives that are explicity and clearly stated are practical and can foster positive results by providing the structure that these students need.

- Ensure that instruments employed as part of the instructional process (either norm-referenced or criterion-referenced) correspond directly to the content of both the basic skills and vocational training curriculum. In this way, students can be assured of some degree of accomplishment and success as they progress through the curriculum, and clearly evident relationships can be shown between test criteria and learning content.

- Methodological Considerations

  - Identify potential dropouts early. In several of the studies reviewed, it was suggested that this identification process should occur during the elementary school years. Moreover, any identification of potential dropouts should be as unobtrusive as possible in order to help avoid the stigma that labels have traditionally placed on these students who already exhibit feelings of isolation and separation from the mainstream of activity in their schools.
  - If a remedial, rather than an integrated basic skills program is employed, avoid the use of the

term "remedial", not only for its pejorative connotation, but also for its obvious effect of reinforcing a caste system that the actual or potential dropout finds so distasteful.

- Whenever possible, opt for an integrated program that combines basic skills instruction or remediation with vocational or occupational training. Research suggests that integrated programs are more meaningful to the dropout or dropout-prone student because the nature of integrated programs relates closely to the pragmatic need of many of these students to find paying jobs.
- Opt for individualized instruction. Successful programs for dropouts typically incorporate individualization to a greater or lesser degree to handle the multifaceted problems and needs of the dropout or dropout-prone student. Available research, although quite limited, suggests that the potential dropout who is usually disenchanted with school and bored or frustrated by traditional teaching methods tends to respond well to individualized attention.
- Be prepared to adapt or otherwise modify commercially-available materials to specific programmatic needs. Available data suggest that most commercially-available, basic skills materials do not reflect vocational content and therefore are not directly useful for integrated basic skills efforts.

Program materials should reflect a low reading level, but one that is appropriate for the students' age level. Consider using various media or multi-modal materials and techniques that can sharpen certain basic skills that are frequently under-represented in programs, (e.g., listening rather than reading). Such multi-modal materials and techniques can also build upon the fact that many dropouts' and potential dropouts' aural facility and comprehension are developed and utilized to a greater degree than their reading or writing skills.

- Because most dropouts must work, include a paid work-experience component for the duration of the program. In addition to providing subsistence, paid work-experiences provide tangible rewards that actual and potential dropouts rarely receive. Also, every effort should be made to relate the students' on-the-job experiences to what they are learning in school, particularly in the area of basic skills.
- Consider ways of providing dropouts and potential dropouts with other incentives and motivation to complete programs (e.g., recognition of accomplishments before their peers).
- Consider the use of peer-tutoring as both an instructional and a reinforcement technique to assist the student with problems. Caution needs to be exercised, however, in establishing egalitarian re-

lationships between tutor and learner to avoid or to mitigate the effects of creating a caste system.

- Conduct further research on the benefits of alternative programming that integrates career exploration with vocational and basic skills curriculum. Also, investigate the potential of alternative programming that accommodates flexible scheduling and shorter class periods, thereby avoiding the lock-step nature of current programs.

- Organizational Considerations

  - Design and implement basic skills programs that address the needs of dropouts and that incorporate two separate, but articulated components--(1) a presecondary component that is targeted toward potential dropouts early in their school careers and is intended to enhance their basic skills levels prior to entry into a vocational or other secondary program and (2) a secondary component designed to foster those basic skills deemed essential to vocational performance.

  - Foster cooperation between basic skills instructional staff and vocational teaching staff to ensure the integrity of materials and techniques that are both relevant and realistic and that contribute to program popularity and success.

  - Conduct inservice workshops to mitigate traditionally negative teacher attitudes toward actual or

potential dropouts, to familiarize teachers with the basic skills deficiencies of these students, and to acquaint teachers with effective remedies for addressing these weaknesses.

- Investigate the establishment of improved linkages with apprenticeship and CETA programs as possible vehicles for securing funds and "work slots" for paid work experiences.
- Conduct further research to determine the optimal mix of staff qualifications and staff size needed to deliver both basic skills and vocational instruction in the most effective manner.
- Conduct further research to assess the extent to which support services contribute to program effectiveness (e.g., a program with several guidance counselors to provide needed support services versus a program with one guidance counselor and a working panel of business, industry, and community leaders).

- Other Considerations
  - Insofar as is possible, locate programs in the regular school plant to avoid segregation and subsequent stigmatization of dropouts or potential dropouts and to encourage their participation in mainstream and extracurricular school activities.
  - Conduct further research on the effects of parental education, parental involvement in the dropout syndrome, and the effects of increased parental involvement early in the educational process.

- Engage in additional research on such basic skills as listening, writing, and oral communications and their potential, complementary effects in fostering learning of other skills such as reading and mathematics.
- Conduct more rigorous assessments of various kinds of programs and program components in order to better estimate their potential impact (e.g., "How reasonable are the estimates of program effects on basic skills noted in table 12?" and "What expectations can we have for increasing those estimates?").
- Undertake more intensive, rigorous research and follow-up activities regarding potential and actual dropouts and various vocational outcomes such as employment history, earnings, and participation in additional training.

Although no specific study or set of recommendations can be expected to resolve a problem as pervasive and enduring as that of high school dropouts, if an effort were made to implement the kinds of research and development activities and instructional programming suggestions listed here, we should expect to realize a measurable degree of progress in that direction. The available evidence strongly suggests that a concerted effort reflecting the general framework and direction indicated by these recommendations could serve to improve both the basic skills levels and occupational potential of dropout-prone students.

REFERENCES

American Speech-Language-Hearing Association and Speech-Communication Association. "Standards for Effective Oral Communication Programs." What Do We Know About Standards for Effective Communication. Washington, DC: U.S. Government Printing Office, (1979): 15-19.

Arizona State Department of Education. Bright Ideas for Career Education: An Arizona Activity Guide. Phoenix: Arizona State Department of Education, 1978.

Austin, J.J., and Sommerfeld, D.A. An Evaluation of Vocational Education for Disadvantaged Youth. Final Report. Muskegon, MI: The Public Schools of the City of Muskegon, 1967.

Baker, E.L. New Directions in Evaluation Research: Implications for Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1979.

Barringer, C. and Gholson, B. "Effects of Type and Combination of Feedback Upon Conceptual Learning by Children and Implications for Research in Academic Learning." Review of Educational Research 49 (1979): 459-478.

Bassett, R.E.; Whitington, N.; and Staten, S. "The Basics in Speaking and Listening for High School Graduates: What Should Be Assessed?" Communication Education 27 (1978): 293-303.

Bates, J.A. "Extrinsic Reward and Intrinsic Motivation: A Review with Duplications for the Classroom." Review of Educational Research 49 (1979): 557-576.

Begle, E.G. "Basic Skills in Mathematics." In Conference on Basic Mathematical Skills and Learning - Volume I: Contributed Position Papers. Washington, DC: The National Institute of Education, 1975.

Bennett, J.C. "Integrate Communication Skills Into the Secondary Curriculum." Business Education Forum 32 (1977): 28-29.

Berryman, S.E. "Vocational Education and the Work Establishment of Youth: Equity and Effectiveness Issues." (N-1475-ASC). Santa Monica, California: The Rand Corporation, June, 1980.

Besant, L. "Lessons from The Rodman Experience with Dropouts." Today's Education 58 (1969): 52-54.

Blicq, R.S. "PIC--A Self-Paced Practical Communications Program for Technical/Vocational Students." Paper presented at the Annual Meeting of the National Council of Teachers of English, New York City. 24-26 November 1977. (ED 150 638)

Blue, J.L., Breslin, A.G.; Buchanan, A.S.; and Leingang, R.L. Occupational Communication Skills Analysis. Olympia: Washington State Commission for Vocational Education, 1976.

Bogdany, M. Mathematics for the Baker. New Brunswick, NJ: Rutgers, The State University, 1976. (ED 120 553)

Bottoms, J.E. Testimony presented before the House Subcommittee on Elementary, Secondary, and Vocational Education, Washington, D.C., March 1, 1979.

Brandt, A. "Why Kids Can't Write." Reader's Digest (1981): 99-102.

Brantner, S.T. and Enderlein, F.E. A Comparison of Vocational Education and Non-vocational High School Dropouts and Retainers: Interim Report. University Park: The Pennsylvania State University, 1972. (ED 068 715)

Brophy, J. "Teacher Praise. A Functional Analysis." Review of Educational Research 51 (1981): 5-32.

Brown, R.D. "Grooming Unemployables for Productive Life." American Vocational Journal 45 (1970): 53-55.

Buckner, M.P. "Effective Dropout Prevention Programs." Paper presented at the Annual Meeting of the National School Boards Association, San Francisco, 1976. (ED 008 283)

Byus, R.F.; Kesler; K.J. McDaniel, C.W.; Naymick, L.C.; Quigley, R.L.; Ruminski, S., Dillon, W.; Harrington, F. and Davis, E. Competencies Common to all Occupations. Charleston: West Virginia Department of Education, Bureau of Elementary and Secondary Education, 1979.

Carnegie Council on Policy Studies in Higher Education. Giving Youth a Better Chance. San Francicso: Jossey-Bass, Inc., 1979.

Carlson, C.D. Pathfinders Project: Exploration Through a Cluster Structure Linking Business, Manpower Agencies, and Vocational-Technical Education by Broadening Information, Aspirations and Career Educational Opportunities. Final Report. Watertown: South Dakota Career Education Project, 1979. (ED 179 725)

Casella, D.A. and Schrader, D.R. "'Tripping' with Borderline Dropouts." The School Counselor 23 (1975): 48-50.

Cawley, J. "Math Curricula for Secondary Learning Disabled Students." In Learning Disabilities in the Secondary School. Title III. Curricular Development for Secondary Learning Disabilities. Bureau of Elementary and Secondary Education. Washington, DC: Division of Compensatory Education, 1977.

Center for Field Research and School Services, An Evaluation of the High School Redirection Program. State Urban Education Program. Brooklyn: New York City Board of Education, 1973. (ED 091 454)

Chiaramonte, J.A. "An Experimental Study to Determine the Comparative Effects of the Contract Method of Teaching and the Traditional Lecture Method of Teaching Upon Achievement in an Elementary Mathematics Course, and Attitudes Towards Mathematics." Dissertation Abstract International 40A: 2523-2524; New York University, 1979.

Church, O. "A Career-oriented Experiental Communication Unit." Business Education World 56 (1975): 23-28.

Clark, S.H. Mathematics Basic Skills Development Project. Minneapolis: Minnesota Department of Research and Education, 1974.

Clayton, S. "Success Story of an Inner-City School." Today's Education 65 (1976): 43-46.

Collins, D., ed. Career Education and Basic Education. Hazard: Kentucky Valley Educational Cooperative, 1971. (ED 182 519)

Combs, J. and Cooley, W.W. "Dropouts: In High School and After School." American Educational Research Journal 5 (1968): 343-363.

The Comprehensive Employment and Training Act of 1973 as amended by the Comprehensive Employment and Training Act Amendments of 1978. P.L. 95-524, October 27, 1978: 92 Statute 1909.

Corman, L. Basic Skills Proficiencies of Secondary Vocational Education Students, Vocational Education Study Publication No. 4. Washington, D.C.: U.S. Department of Education, 1980.

Cosler, N., ed. Individualized Math Problems in Whole Numbers. Oregon Vo-Tech Mathematics Problem Sets. Salem: Oregon State Department of Education, 1974. (ED 123 084)

Crawford, J. Project Emerge, Dayton, Ohio 1973-74: Final Evaluation Report. Dayton, OH: Dayton Board of Education, 1974. (ED 094 097)

Creech, F.R. A vocational re-evaluation of the Base Year Survey of the High School Class of 1972; Part I: Selected characteristics of the Class of 1972. Final Report. (ETS-PR-74-23) Princeton, NJ: Educational Testing Service, 1974.

Crowe, M.R., and Harvey, R.J. Retention of Concepts Resulting From Learning By Experience. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1979.

Crowl, L.C. "Learning Skills Centers in Kansas Vocational Schools." Paper presented at 21st annual meeting of the International Reading Association, 10-14 May 1976 in Anaheim, CA.

Cummings, D.W. Basic Skills and the Writing Process. Paper presented at the Annual Meeting of the Secondary School English Conference, 2-4 April 1976, Boston.

Custer, H.F., Jr. "The Martha's Vineyard Regional High School Case Program: An Historical-Assessment Study of Cooperative Vocational Education in a Semi-Rural, Isolated School District." Dissertation abstract, University of Massachusetts, 1973.

Dickerson, E. A Sheltered Workshop Experience Centered Vocational Curriculum for Low Achieving Students: Final Report. Sylacauga City, AL: Sylacauga City School District, 1973.

Doggett, M. "Aiding the Seriously Deficient Learner in Computation." Mathematics Teacher 71 (1978): 488-93. (ED 191 247)

Droege, D.C. "Occupational Aptitudes of High School Dropouts." Vocational Guidance Quarterly 46 (1968): 185-187.

Dull, L., ed. Relationship of Math and Science Principles to Vocational Curricula. The Heart of Instruction Series No. 8. Columbus, OH: The Ohio State University, 1977.

Echternacht, G. A Vocational Re-evaluation of the Base Year Survey of the High School Class of 1972; Part II: Characteristics Distinguishing Vocational Students from General and Academic Students. Final Report. (ETS-PR-75-3) Princeton, NJ: Educational Testing Service, 1975.

Education Daily. "Clark Says, 'Criminally Inferior' Education the Root of Black Joblessness." October 2, 1979, p. 6.

Education Daily. "Wertz Calls for Community School-to-Work Programs." October 24, 1979, p. 4.

Elgarten, G.H. "A Mathematics Intramurals Strategy Contest." Mathematics Teacher 69 (1976): 477-478. (EJ 147 177)

Escoe, A.S. "The Communications Experience Approach to Learning Basic Skills." Paper presented at the Annual Meeting of the College Reading Association, Cincinnati, OH. 26-29 October 1977,

Evans, F.R., and Patrick, C. "Antecedents and Patterns of Academic Growth of School Dropouts." In Study of Intellectual Growth and Vocational Development. Final Report, edited by T.L. Hilton. Princeton: Educational Testing Service, 1971. (ED 056 063)

Evans R.N. & Galloway, J.D. "Verbal ability and socioeconomic status of 9th and 12th grade college preparatory, general, and vocational students." The Journal of Human Resources, 1973, 8 (1): 24-36.

Federal Register, Volume 42, No. 191, October 3, 1977, Part VI. Rules and Regulations for Education Amendments of 1976, Title II of P.L. 94-482, Vocational Education, State Programs, and Commissioner's Discretionary Programs.

Federal Register, Volume 44, No. 115, June 13, 1979, p. 33960-33961. Department of Health, Education, and Welfare, Office of Education. (Request for Suggestions Regarding Implementation of 8 Bureau of Occupational and Adult Education Priorities for Vocational Education).

Fey, J. "Classroom Teaching of Mathematics." Review of Educational Research 39 (1969): 535-551.

Flanagan, J.C.; Davis, F.B.; Dailey, J.T.; Shaycoft, M.F.; Orr, D.B.; Goldberg, I.; & Neyman, C.A., Jr. The American High-school Student. (Coop. Res. Project No. 635). Pittsburgh, PA: Project TALENT Office, University of Pittsburgh, 1964.

Foster, R.M., and Kahler, A.A. "Importance of Including Language Arts Instruction as Part of the Vocational Agriculture Program of Study." The Journal of Vocational Education Research 4 (1979): 13-33.

Frank, L.K. "Four Ways to Look at Potentialities," in New Insights and the Curriculum. Edited by Alexander Frazier. Washington, D.C.: Association for Supervision and Curriculum Development, The National Education Association, 1963.

Freas, A.L. "The relationship of reading ability and training success in five vocational courses." Dissertation Abstract, Temple University, 1978.

Good, C.V., ed. Dictionary of Education. 3rd Ed. New York: McGraw-Hill Book Co., 1973.

Gorman, C.V. "Sheltered Workshop Prepares Potential Dropouts for On-the-Job Training." American Vocational Journal 53 (1978): 42-44.

Griffin, C.W. "The Decline in Writing Ability - What the Secondary Teacher Needs to Know How to Teach." Paper presented at the Annual Meeting of the Conference on College Composition and Communication, Kansas City, MS. March 31-April 2, 1977.

Grotelueschen, A.D., and Gooler, D.D. "Evaluation in Curriculum Development," in Curriculum Handbook: The Disciplines, Current Movement, Instructional Methodology, Administration, and Theory. Abr. Ed. Boston: Allyn and Bacon, Inc., 1977.

Grubb, F.S. Games for Learning. New Brunswick, NJ: Rutgers-The State University, 1978. (ED 149 148)

Hakanen, L.J. "The Stride Program: An Answer to Absenteeism." Phi Delta Kappan 59 (1978): 348-349.

Hall, J.D. "Students Need to Learn Interpersonal Communication." Business Education Forum 26 (1972): 7-9.

Harris, E. and Kendall, E. Do You Read Me--Good Buddy? Huntington, WV: Marshall University, 1978.

Harvey, R.L. "Strategies for Teaching Reading in Adult Basic Education With an Emphasis on Eclecticism." Adult Literacy and Basic Education 3 (1980): 280-282.

Heimer, R.T. "Conditions of Learning in Mathematics: Sequence Theory Development." Review of Educational Research 39 (1969): 493-508.

Hernandez, N.G. "Instructional Strategies in Mathematics Education." The Mathematics Teacher 66 (1973): 607-612.

Herr, N.K. Basic Mathematics Operations - A Math Practice Booklet. New Brunswick, NJ: Rutgers-The State University, 1976.

Hilton, T.L. A Study of Intellectual Growth and Vocational Development. Final Report. Princeton: Educational Testing Service, 1971. (ED 056 063)

Holder, B. "Varying Writing Instruction With Group Writing Format." Business Education Forum 33 (1979): 22-24.

Hornbostel, V.D.; Egermeier, J.C.; Twyman, J.P.; and Wallace, G.R. The Rehabilitation of School Dropouts in Oklahoma City: An Experimental Appraisal Final Report. Stillwater: Oklahoma State University, 1967. (ED 021 979)

Huber, M. "Profile of a Dropout." California Education 1 (1963): 3-5.

Hudgins, B.B. The Instructional Process. Chicago: Rand McNally and Co., 1971.

Hulbert, J.E. "Facilitating Intelligent Business Dialogue." Business Education Forum 33 (1979): 10-16.

Ichilov, O. "Alternatives to Nonschooling: Youth Outside School in Israel." Adolescence 13 (1978): 45-54.

Jackson, D. "Provide Solid Foundations for Good Business Communications." Business Education Forum 32 (1977): 31-33.

Johnson, J.E. "Learning Language Arts Skills In Gregg Shorthand: A Research Study." Business Education World 5b (1976): 3; 24-25.

Johnson, L. Minneapolis Edison High School Employability Skills Program: An Evaluation, 1972-73. Minneapolis: Minnesota Department of Research and Evaluation, 1973.

Jones, D. "Coordinated Occupational Communications: An Experiment in Kansas Vocational School." American Vocational Journal 47 (1972): 46-48.

Jones H.B. Dropout Prevention: Diversified Satellite Occupations Program and Career Development. Final Report. Salt Lake City, UT: Granite School District, 1973.

Karnes, M.B.; Zehrbach, R.R.; Jones, G.R.; MacGregor, N.E.; George, J.M. The Efficacy of a Prevocational Curriculum and Services Designed to Rehabilitate Slow Learners Who Are Drop Out, Delinquency, and Unemployment Prone. Champaign, IL: Champaign Community Unit IV Schools, 1966. (ED 016 106)

Kelly, F.J.; Veldman, D.J.; and McGuire, C. "Multiple Discriminant Prediction of Delinquency and School Dropouts." Educational and Psychological Measurements 24 (1964): 535-544.

Kieren, T.E. "Activity Learning." Review of Educational Research 39 (1969): 509-522.

Kirkpatrick, M.A. "A Comparison of a Multimedia Approach and a Programmed Approach in Testing a Basic Algebra Course at Roane State Community College." Dissertation Abstract International 39A: 6506; The University of Tennessee, 1979.

Knowles, M.S. The Modern Practice of Adult Education: Androgogy Versus Pedagogy. New York: Association Press, 1972.

Koopika, B. Identification of Mathematics Competencies for Vocational, Technical and Adult Education Through a Survey of Employer/Incumbent Employer Expectations: Final Report. Green Bay: Northeast Wisconsin Technical Institute, 1980.

Kuhn, D., and Pressman, H. Working Together: Multi Purpose Programs for Troubled Youth. Washington, DC: Benchmarks, Inc., 1980.

Langsdorf, M. and Gibboney, R.A. The Career Intern Program: Final Report. Volume I: An Experiment in Career Education That Worked. NIE Papers in Education and Work: Number Seven. Elkins Park, PA: Gibboney Associates, Inc., 1977. (ED 142 795)

Larsen, J.J., and Gultinger, H.J. "A Secondary Reading Program to Prevent College Reading Problems." Journal of Reading 22 (1979): 399-403.

Larson, M.E., and Valentine, I.E. Vocational Education: Principles and Concepts. Fort Collins, CO: Department of Vocational Education, 1976.

Lessinger, L.M. "Accountability and Curriculum Reform." In Curriculum Design in A Changing Society, edited by Richard W. Burns and Gary D. Brooks. Englewood Cliffs, NJ: Educational Technology Publications, 1970.

Long, T.E. Basic Mathematics Skills and Vocational Education. Information Series, No. 199. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980. (ED 186 608)

Long, T.E.; Enderlein, T.E.; Ford, J.A.; and King, E.C. Determination of the Basic Mathematics Skill Needs and the Need for Mathematics Remediation for Secondary Vocational Education Students. University Park: The Pennsylvania State University, 1973. (ED 112 156)

Ludeman, I. and Schneiderhan, R.M . Statewide Mathematics Performance Related to Career and Vocational Education: Final Report Project No. 7-p-75. Minneapolis, MN: Department of Education, 1976.

Macdonald, J.B.; Anderson, D.W.; and May, F.B., eds. Strategies of Curriculum Development: Selected Writings of the late Virgil E. Herrick. Columbus, OH: Charles E. Merrill Books, 1965.

Mahaffey, M.L. and McKillip, W.D. Career Oriented Mathematics: Teacher's Manual. Nashville, GA: Berrien County Board of Education, 1975. (ED 116 930)

Maletsky, Evan M. "Activities Maintaining Computational Skills." Mathematics Teacher 68 (1975): 301-308. (ED 116 664)

Maser, A.L.; Johnson, V.; and Davis, J. Highline Public Schools Computer Assisted Instruction Project: A Program to Meet Disadvantaged Students' Individual Needs for Basic Skill Development. Final Report. Seattle, WA: Highline Public Schools, 1977. (ED 167 114)

Massachusetts Department of Education. Massachusetts Assessment of Basic Skills, 1978-79. Technical Report. Boston, MA: Bureau of Research and Assessment, September 1979. (ED 183 620)

Mertens, D.M.; McElwain, D.; Garcia, G.; and Whitmore, M. The Effects of Participating in Vocational Education: Summary of Studies Reported Since 1968." Research and Development Series, No. 202. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1980. (ED 199 435)

Melder, T.D. "Facilitating Industrial Communications: Listening, Speaking, Writing, Reading, Grade XII. Natchitoches, LA: Natchitoches Parish School Board, 1973. (ED 088 053)

Mellon, J.C. Transformational Sentence Combining. Cambridge: Harvard University, 1969. (ED 018 405)

Messenger, J. "A Vocationally Oriented Skills Center for Remedial Learning." Technical Education News 36 (1977): 19-20.

Mikulecky, L., and Haugh, R. Reading in the Business Education Classroom. Washington, DC: National Education Association of the United States, 1980.

Moe, A.J.; Rush, R.T.; and Storlie, R.L. The Literacy Requirements of a Secretary on the Job and In a Vocational Training Program. Lafayette, IN: Purdue University, 1979. (ED 182 696)

National Center for Education Statistics, The First National Assessment of Career and Occupational Development: An Overview. Career and Occupational Development Report No. 05-COD-00. Denver: Education Commission of the States, National Assessment of Educational Progress, 1976. (ED 137 604)

National Council of Supervisors of Mathematics, "Position Paper on Basic Mathematical Skills." In What Do We Know About Standards for Effective Basic Skills Programs? Washington, DC: U.S. Government Printing Office, 1979.

National Council of Teachers of Mathematics. "Report of the Kansas City Coordinating Conference" In What Do We Know About Standards for Effective Basic Skills Programs? Washington, DC: U.S. Government Printing Office, 1979.

National Institute of Education. Volume I, Conference on Basic Mathematical Skills and Learning: Contributed Position Papers. Washington, DC: U.S. Government Printing Office, 1975.

National Institute of Education, Volume II, Conference on Basic Mathematical Skills and Learning: Working Group Reports. Washington, DC: U.S. Government Printing Office, 1975.

Neill, Boes, S., ed. Keeping Students in School: Problems and Solutions. Sacremento: Education News Service, 1979. (ED 177 704)

New York City Board of Education. An Evaluation of the High School Redirection Program. State Urban Education Program. New York: New York City Board of Education, 1973. (ED 091 454)

O'Hare, F. Sentence Combining. Urbana, IL: National Council of Teachers of English, 1973. (ED 073 483)

Oregon State Department of Education. Interdisciplinary Support Classes. Final Report. Salem: Oregon State Department of Education, Division of Community Colleges and Vocational Education, 1974. (ED 121 976)

Parkhurst, R.E. "An Enrichment System for Any Classroom." Arithmetic Teacher 28 (1981): 45-46.

Pearce, G.C. "Help Students Produce More Understandable Writing." Business Education Forum 32 (1978): 27-29.

Perkins, L.H. "Florida's IMTS-A Vo-ed Success Story." School Shop 40 (1980): 19-20.

Porter, J.W. "The Heart of the Dropout Problem." Michigan Education Journal 40 (1963): 362-365.

Powell, W.R.; Bolduc, E.J.; Crews, R.; Kantowski, M.; Smith, L.L.; and Wenzel, E. Project to Improve Education in the Basic Skills (Reading, Writing, Computing, Speaking and Listening. Tallahassee: Florida State Department of Education, 1976. (ED 128 836)

Rahmlow, H.F. A Series of Programmed Instruction Books for Learning Occupationally Oriented Basic Mathematics. Final Report. Pullman, WA: Washington State University, 1968. (ED 022 928)

Randolph, D.L. and Holmes, W.A., eds. A Program for Early Detection and Attitudinal Reorientation of Potential School Dropouts. Hattiesburg: University of Southern Mississippi, 1973. (ED 074 407)

Raymond, E. "A Volunteer Dropout Presentation Program." NASSP Bulletin 62 (1978): 91-97.

Redfering, D.L. and Cook, D. "Relationships Among Vocational Training, Income, and Job Complexity of High School Dropouts and High School Graduates." Journal of Vocational Behavior 16 (1980): 158-162.

Rehberg, R.A., and Rosenthal, E.R. Class and Merit in the American High School: An Assessment of the Revisionist and Meritocratic Agreements. New York: Longman, Inc., 1978.

Reiff, R. "Developing Language Arts Skills for Today's Secretarial Student." The Journal of Business Education 52 (1976): 13-15.

Rhode Island Department of Education. Vocational Education Early Leaver Study. Final Report. Providence: Rhode Island Department of Education, 1978. (ED 164 987)

Ritter, E.M., "Back to Basics and Accountability Issues in Secondary School Speech Education." Communication Education 27 (1978): 119-126.

Romberg, T.A. "Current Research in Mathematics Education." Review of Educational Research 39 (1969): 473-491.

Rosenthal, Reingold, J. "Youth Act of 1980: A Summary." ETA Exchange 6 (1980): No. 8.

St. Paul Public Schools. Model Program for Handicapped, Out-of-School Youth 1977-81. St. Paul: St Paul Public Schools, 1980. (ED 191 233)

Sawhill, I.V. Testimony presented before the Senate Committee on Labor and Human Resources, Washington, DC, October 24, 1979.

Schneider, E.J. "Another 'Back to the Basics' Push Isn't Going to Help Today's Schools." Educational R&D Report 4 (1981): 2-7.

Scott, L.T. "Developing a Language Arts Program for the Nonacademic Adolescent." Paper presented at the Clemson University Reading Conference, 30 September 1971, South Carolina. (ED 055 763)

Selland, L. Secondary Math Activities of the North Dakota Exemplary Project in Career Education. Bismarck: North Dakota State Board for Vocational Education, 1973.

Sewell, T.E.; Palmo, A.J.; and Manni, J.L. "High School Dropout: Psychological, Academic and Vocational Factors." Urban Education 16 (1981): 65-76.

Sharar, P.H. "Changes in the Social Adjustment of Disadvantaged Male High School Dropouts as a Result of Vocational Training and Employment." Ph.D. dissertation, Columbia University, 1974.

Sherrel, E.G. Comparisons of Reading Readiness of Vocational-Technical Students and the Success Attained in These Courses. Final Report. Springfield: Southwest Missouri State University, 1978. (ED 175 997)

Smelstor, M., ed. A Guide to Using the Field Work Technique to Teach Writing. Madison: Wisconsin University, 1979. (ED 177 599)

Smith, A. Final Report-Interdisciplinary Support Classes. Banks, OR: Banks High School District 13, 1974. (ED 121 976)

Smith, J.E.; Tseng, M.S.; and Mink, O.G. "Prediction of School Dropouts in Appalachia: Validation of a Dropout Scale." Measurement and Evaluation in Guidance 4 (1971): 31-37.

Smith, L.R. "Task-Oriented Lessons and Student Achievement." Journal of Educational Research 73 (1979): 16-19.

Spann, M. Vocational Related Math, A Curriculum Guide. Stillwater: Oklahoma State Board of Vocational and Technical Education, 1972.

Spotts, R. and others. Evaluation of the Greenhouse Program 1977-78. Experience-Based Career Education. San Francisco: Far West Laboratory for Educational Research and Development, 1978. (ED 170 052)

Stein, E.M.; Ball, H.E., Jr.; Conn, G.T.; Haran, J.; and Strizver, G.L. "A Contingency Management Day Program For Adolescents Excluded from Public School." Psychology in the Schools 13 (1976): 185-191.

Sticht, B. Literacy and Vocational Competence. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1978.

Stufflebeam, D.I.; Foley, W.J.; Gephart, W.J.; Guba, E.G.; Hammond, R.I.; Merriman, H.D.; and Provus, M.M. Educational Evaluation and Decision Making. Itasca, IL: Peacock Publishers, Inc., 1971.

Suydam, M.W. and Weaver, J.F. "Research on Mathematics Education reported in 1978." Journal for Research in Mathematics Education 19 (1979): 241-320.

Taba, H. Curriculum Development: Theory and Practice. New York: Harcourt, Brace, and World, Inc., 1962.

Templin, R.; Fisher, E.; Tyler, H.; and Wise, J. Learning Activity Packets for Minimal Mathematics Competencies in Vocational Education. Final Report. Dorchester, SC: Dorchester Vocational Center, 1978.

Thompson, D.E. A Guide to the Basic Skills: Coordinated Vocational-Academic Education Program. Houston: Houston Independent School District, 1971.

Thornburg, H.D. "An Investigation of a Dropout Program Among Arizona's Minority Youth." Education 94 (1974): 249-265.

Thornton, L.J. Basic Reading Skills and Vocational Education. Information Series No. 200. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Thro, E.G. Development and Evaluation of a Vocational Experience Curriculum for Educable and Disadvantaged Students: Final Report. Elizabethtown, KY: Hardin County Board of Education, 1976.

Thurow, L.C. "Vocational Education as a Strategy for Eliminating Poverty." In The Planning Papers for the Vocational Education Study, Volume 1. Washington, DC: U.S. Government Printing Office, 1979.

Tobias, S., and Weissbrod, C. "Anxiety and Mathematics: An Update." Harvard Educational Review 50 (1980): 63-70.

Trent, E.R. Interim Report One: Ohio Department of Education Basic Skills Study. Columbus, OH: Ohio Department of Education, 1982.

Tyler, R.W. Basic Principles of Curriculum and Instruction. Chicago: The University of Chicago Press, 1970.

U.S. Department of Health, Education and Welfare, Office of Education. What Do We Know About Standards for Effective Basic Skills Programs? Washington, DC: U.S. Government Printing Office, 1979.

Vogel, A. "How to Check Dropouts." School Management 5 (1961): 75-84.

Walmsley, S. "On the Purpose and Content of Secondary Reading Programs: An Educational Ideological Perspective." Curriculum Inquiry (1981): 73-93.

Walters, H.E. and Kranzler, G.P. "Early Identification of the School Dropout." The School Counselor 18 (1970): 97-104.

Walther, R.H., and Magnusson, M.L. A Study of the Effectiveness of Graham Associates' Demonstration Project on Education Programming in Manpower Training Projects. Washington, DC: Manpower Research Projects, The George Washington University, 1975.

Ware, B.A. "A Second Chance for High School Dropouts." Journal of Home Economics 67 (1975): 17-20.

Whirtner, J.A. and Antin, A.P. Program Planning--Using Management by Objectives in School Administration. Successful School Administration Series. Englewood Cliffs, NJ: Prentice Hall, Inc., 1972.

White-Stevens, L. Adolescent Programs that Work: A National Survey of Successful Educational Programs for Adolescent Students. Trenton: New Jersey State Department of Education, 1978. (ED 175 041)

Williams, R.D. "What Teaching Methods When?" Theory Into Practice 19 (1980): 82-86.

Williams, T.; Clancy, J.; Batten, M.; and Girling-Butcher, S. School, Work, and Career: Seventeen Year Olds in Australia. Victoria, Australia: The Australian Council for Educational Research Limited, 1980.

APPENDICES

APPENDIX A

Basic Skills Literature Matrix*

References Basic Skill – Mathematics	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Arizona State Department of Education (1978)				X
Begle (1977)		X	X	X
Bogdany (1976)		X	X	
Byus (1979)		X		
Cawley (1977)	X			
Chiaramonte (1979)	X			X
Clark (1974)	X	X	X	X
Cosler (1974)				X
Doggett (1978)	X	X	X	X
Elgarten (1976)	X			X
Fey (1969)		X	X	X
Grubb (1978)				X
Heimer (1969)				X
Hernandez (1973)				X
Herr (1976)			X	X

*This matrix has been prepared in order to summarize the literature related to basic skills and vocational education. Some references do not relate directly to vocational education but were considered relevant.

The (X) indicates citing of strategy in the designated article.

Basic Skills Literature Matrix

References Basic Skill – Mathematics	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Kieren (1969)	X			X
Kirkpatrick (1979)	X			X
Koopika (1980)		X		
Long (1973)		X		X
Long (1980)		X	X	
Ludeman (1976)	X			
Mahaffey (1975)	X	X	X	X
Maletsky (1975)			X	X
Dull (1977)		X	X	X
Messenger (1977)			X	X
Moe (1979)		X		
National Council of Supervisors of Mathematics (1979)		X		
National Council of Teachers of Mathematics (1979)		X	X	
National Institute of Education (1975; a and b)		X		
Parkhurst (1981)				X
Rahmlow (1968)		X	X	X
Romberg (1969)		X	X	X
Selland (1973)		X	X	X

Basic Skills Literature Matrix

References Basic Skill – Mathematics	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Smith (1979)	X			X
Spann (1972)			X	
Suydam (1979)		X	X	X
Templin (1978)	X	X	X	X
Thompson (1971)	X	X	X	
Thro (1976)	X	X	X	X
Tobias (1980)	X		X	X
White-Stevens (1978)			X	X

Basic Skills Literature Matrix

References Basic Skill – Reading	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Austin and Sommerfeld (1967)	X	X	X	X
Blue, Breslin, Buchanan, Leingang (1976)		X		
Clayton (1976)				X
Collins, (1979)	X	X	X	X
Crowe and Harvey (1979)	X	X	X	X
Crowl (1976)				X
Foster and Kahler (1979)		X		X
Harris and Kendall (1978)	X	X	X	X
Harvey (1980)				X
Hopkins (1980)			X	
Johnson (1976)	X	X	X	X
Larsen and Gultinger (1979)		X	X	X
Messenger (1977)		X	X	X
Mikulecky and Haugh (1980)	X	X	X	X
Sherrell (1978)	X	X	X	X

*This matrix has been prepared in order to summarize the literature related to basic skills and vocational education. Some references do not relate directly to vocational education but were considered relevant.

The (X) indicates citing of strategy in designated articles.

Basic Skills Literature Matrix

References Basic Skill – Reading	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Smith (1974)		X	X	X
Sticht (1978)			X	
Thornton (1980)	X	X	X	X
Dull (1977)				X

Basic Skills Literature Matrix

References Basic Skill – Writing	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Bennett (1977)				X
Blicq (1977)	X		X	
Cummings (1976)				X
Escoe (1977)				X
Foster and Kahler (1979)				X
Holder (1979)				X
Jackson (1977)		X		X
Johnson (1976)	X			X
Jones (1972)		X	X	
Pearce (1978)				X
Powell (1976)		X		X
Reiff (1976)				X
Scott (1971)				X
Smelstor (1979)				X
Dull (1977)				X

*The matrix has been prepared in order to summarize the literature related to basic skills and vocational education. Some references do not relate directly to vocational education but were considered relevant.

The (X) indicates citing of strategy in designated articles.

Basic Skills Literature Matrix

References Basic Skill – Oral Communication	Program Strategy Components			
	Evaluation	Instructional Planning	Program Development	Instructional Methods
Bassett, Whitlington, Staton (1978)	X			
Blue, Breslin, Buchanan, Leingang (1976)	X			
Church (1975)	X	X	X	X
Clayton (1976)				X
Foster and Kahler (1979)	X			
Hall (1972)	X			X
Hulbert (1979)	X			X
Melder (1973)				X
Ritter (1978)	X			
Smith (1974)			X	X
U.S. Department of HEW (1979)	X			
Dull (1977)		X	X	X

*This matrix has been prepared in order to summarize the literature related to basic skills and vocational education. Some references do not relate directly to vocational education but were considered relevant.

The (X) indicates citing of strategy in the deisgnated article.

Appendix B

INSTRUCTIONAL METHODS: MODELS CHART

BEHAVIOR MODIFICATION

In this approach the teacher employs a systematic plan for presenting learning tasks. The tasks are usually arranged from the simple to the complex.

In addition to planning a hierarchy of learning tasks this model involves changing the students' achievement level through conscious manipulation of reinforcement. The literature on this model, while voluminous, is complex and the dangers in misapplying the model are great.

Williams (1980)
Brophy (1981)
Barringer (1979)
Bates (1979)

COMMUNICATION EXPERIENCE APPROACH

This approach involves the use of group activities to assist students to improve basic communication skills. There are seven processes involved in the approach: purpose setting, spoken language, recording of speech, reading, revision, use of written product, and skill development.

Ths skill development process occurs throughout each of the preceeding six phases. Each process is the basis for the next process to be completed. The students' skills are improved by communicating within the group setting.

Escoe (1979)

CONTRACT METHOD

In the contract method the student may elect a predesigned work option or negotiate a customized agreement with a teacher for a grade. The contract maps out the activities the student will engage in, identifies the products the student will produce, and states the grade to be awarded upon completion of the activities and products.

Contracts may be used in individualized instruction or in larger classrooms, expecially where self-paced learning is encouraged and contracts may be perceived by the student as a motivator.

Chiaramonte (1979)
Parkhurst (1981)

EXPOSITORY TEACHING

This technique begins with the teacher providing a preinstructional statement at a high level of abstraction. The statement is a generalization or principle related to a discipline. It is presented first to serve as a conceptual organizer. The global statement is then followed by explanations and examples. These clarifications are deduced from and are at a lower level of abstraction than the preinstructional statement.

Expository teaching is well suited to large classrooms in that clarification and integration of new ideas taught with what has already been presented is done through a lecture or lecture-discussion format.

Hernandez (1973)

FIELD EXPERIENCE APPROACH

This approach is a vehicle for teaching composition through fieldwork. The students' community is used as raw material to motivate writing. Students are given the opportunity to use the skills learned in the classroom in real life situations and to develop varied human relationships. The field experience approach can be used to motivate students and serve as an impetus for individual as well as group projects.

Smelstor (1979)

GROUP WRITING

Group writing is a a very effective way to vary writing instruction. Students who work well together but have varying degrees of writing capability are grouped as a team. The students learn from each other as they complete the stages from composing to evaluation and synthesis which involve: a lecture on a particular writing task, preparation of individual drafts of the writing assignment, a group session to examine and discuss the drafts of group members and to develop a group draft, class critique of group drafts, a group session to revise the drafts, and a class session to discuss the final drafts. The advantages of using group writing with students include the opportunities for rapid feedback, peer response, and varied evaluative comments.

Holder

INDUCTIVE TEACHING

This model actively involves the student in the process of concept formation. The learner organizes data into clusters formed on the basis of similarity, labels these groups, and may hypothesize relationships or generalizations about the clusters.

"The instructor guides the development of the categories by the use of appropriate questions, for instance, What do you see? What belongs together? Why do these go together? What would you call these? Describe these. Can you state a rule? State the formula" (Hernandez, 1973: 609).

Two specific forms of the inductive model are activity learning and discovery learning.

Hernandez (1973) Kieren (1969)

INQUIRY MODEL

In the inquiry method the teacher poses a problem for the students. The students then formulate a solution using both deductive and inductive reasoning. The students analyze data by "asking questions about the relationships among the variables being considered in the learning task. The students do the questioning or indicate the direction in which the solution is to be found. Subsequently the students may analyze their own strategies" (Hernandez, 1973: 610).

Hernandez (1973)

LANGUAGE EXPERIENCE APPROACH

This approach can be used with students who have difficulty in reading. Each student dictates a story, detailing his or her real-life experiences to another student who serves as a secretary or recorder. Students are encouraged to use the vocabulary with which they are most familiar.

Scott (1971)

PROGRAMMED INSTRUCTION

Programmed instruction is a guided independent study approach that fits each learning experience to the needs of the student. Students are, generally, given a core of instructional units to complete after which they may select numerous topics from a set of optional units to comprise their own individualized program. Each student moves at his or her own pace. Students who are ambitious can complete more learning experiences in less time than in the more traditional classroom setting.

Blicq (1977)
Kirkpatrick (1979)
Rahmlow (1968)

SENTENCE COMBINING

Teachers use sentence combining as a learning experience to improve the writing skills of their students. Students are given several sentences and clues or signals which help them to combine the sentences to construct one complete sentence or a two or three sentence paragraph. The students use various sentence structures and clauses that result in a more mature style of writing. The students can gain self-confidence from reading their well-written sentences and develop an increased interest in composition.

Dull (1977)
Mellon (1969)
O'Hare (1973)

STRANDING ASSIGNMENTS

"Stranding" is designed to assist vocational teachers in the organization of time and learning goals. The teacher presents the learning goals for the week and "strands" the presentation toward these goals over the five-day week. This model enables the teacher to present a variety of information on a daily basis which helps to maintain students' attention and motivates them at a high level. Because the same learning goals are reinforced daily, student learning difficulties associated with missing class or inattentiveness are avoided.

Mikulecky and Haugh (1980)

APPENDIX C

INSTRUCTIONAL METHODS: ACTIVITIES CHART

MATH	ORAL COMMUNICATION	READING	WRITING
• simulate problem-solving situations from various work settings • calculate math problems relevant to various occupations • complete math puzzles • take math quizzes • participate in a daily verbal drill • complete daily exercises on mental computation • engage in individual games • participate in group games • solve word problems • calculate algorithms • complete a comprehensive math course, e.g., for the baker, where all problems are relevant to a specific occupation	• play roles using videotape • use communication associated with various occupations • communicate response to cartoons and other visual stimuli • follow oral directions • participate in group discussions • take notes while listening • express feelings verbally • practice vocabulary drill • participate in competitive individual and group review sessions • pass a quiz on a speaker's presentation • strengthen proficiency in recall through writing a synopsis of major points or passing a form quiz • lead discussion groups	• read scripts on videotapes • play roles using favorite TV shows • participate in spelling bees (word building) • practice taking tests to improve skills • improve punctuation, vocabulary, and spelling by using Gregg shorthand • sound out words • use syllabication and stress of words to strengthen skills • use mock interviewing with script • memorize whole words and their meaning • use the context to get meaning • analyze phrases, sentences and paragraphs	• use puzzles and worksheets • use headings, develop outlines, and compose materials • evaluate spelling and syntax • participate in group drills with a specific purpose in mind—context, spelling, punctuation, proofreading, and new vocabulary definitions • complete quizzes • complete word study—analyze synonyms, antonyms, homonyms • study vocabulary lists • appreciate writing and realize the process of effective communication • keep a personal journal • practice writing in a relaxed manner

APPENDIX C (continued)

MATH	ORAL COMMUNICATION	READING	WRITING
• participate in class contests on math drills • use a calculator in problem solving • use a computer to sort and analyze data • interpret data using computer printouts • participate in a workshop dealing with math anxiety where behavioral modification and motivation theory are used	• verbally explain ideas clearly and sufficiently • ask pertinent questions • participate in conversations/ discussions intelligently and courteously • make oral presentations • practice feedback, clarification, and negotiation skills in dyads • use speaking and listening exercises related to occupations • model and practice verbal/ nonverbal communication codes • resolve conflict in groups • evaluate effective communication using modeling films • describe everyday objects • interview adults	• review material for main ideas • vary reading style to fit material • use supplementary reading materials • develop specialized vocabulary • read the media: TV; radio; analyze newspapers and magazines • analyze business forms and catalogues for vocabulary improvement	• participate in team competition • plan games for vocabulary building, bingo, crossword, password write essays • role play written scripts or act out scenes • prepare resumes, applications for jobs, and autobiographies for entrance into vocational school • respond in writing to directions • write to communicate adequately (application blanks, letters to to invite speakers • write scripts for conversations and letters for written communication • participate in the three stages of writing—drafting, editing, preservation • edit own writing by concentrating on one type of error at a time.

APPENDIX D

Abstracts of Empirical Studies Referenced
in Tables 10 Through 13

Austin, J.J., and Sommerfeld, D.A. An Evaluation of Vocational Education for Disadvantaged Youth: Final Report. Muskegon, Michigan: The Public Schools of the City of Muskegon, 1967.

Program Description:

During the first phase of the program (six months), participants spent a half-day in classes designed to improve their basic skills and appearance and a half-day in one of several vocational training shops where their interests and aptitudes regarding particular occupations were conducted. The training in basic skills that was provided was tailor-made to address the specific needs of the individual trainee. Numerous counseling sessions were also provided.

The second program phase involved the students for six hours a day in shop/occupational training and for two hours of related math and communications. All trainees spent a minimum of four months in training and the average was approximately nine months. All training was conducted at the Skill Training Center in Muskegon, Michigan.

Sample(s):

The total sample of 278 trainees consisted of disadvantaged (dropouts) who were between 16 and 21 years old and were about two-thirds males. The "Experimental" (E) group was defined as those trainees who completed more than four months of the program (n = 189). The "Control" (C) group consisted of the 89 trainees who either never

entered the training program or quit the program during the initial three months. About two-thirds of each of these subsamples were worthwhile.

Instrument(s) and Point(s) of Administration:

The primary criteria/tests employed were the Wide Range Achievement Test-WRAT (reading, spelling, and arithmetic) and the WAIS Verbal IQ test. Both tests were administered to both groups prior to program initiation and again after the training session was completed (1965-1966 period).

Brantner, S.T., and Enderlein, F.E. A Comparison of Vocational Education and Non-vocational High School Dropouts and Retainers: Interim Report. University Park: Pennsylvania: The Pennsylvania State University, 1972), ED 068715.

Program Description:

The programs considered were the normal, academic general and vocational programs offered by the school district in a small city in central Pennsylvania (70,000 population). Those programs were not altered as part of the study, nor were students assigned to them in accordance with the requirements of one or more "treatments."

Sample(s):

The total sample consisted of 780 students (on whom complete data were available), which was about equally split between males and females. The specific subsamples of groups considered in the study were as follows:

- Nonvocational retainers (NR)--523 students
- Vocational retainers (VR)--191 students
- Nonvocational dropouts (ND)--30 students
- Vocational dropouts (VD)--36 students

Instrument(s) and Point(s) of Measurement:

The measures employed in the study that are used as indicators of students' basic skills are:

- GATB (General Aptitude Test Battery)--Verbal, which measures ability to understand the meanings of words, to use them effectively, to understand/comprehend language.
- GATB-Numerical Aptitude, which assesses ability to perform arithmetic operations quickly and accurately.
- APT (Academic Promise Test)--Verbal, which deals with simple and complex concepts via verbal analogies.
- APT-Nonverbal, which involve some arithmetic computation but focuses on the understanding of arithmetic concepts.

These and other instruments were administered to the students in the Spring of 1969 when they were 9th graders. Follow-up activities to determine retention status was completed in January, 1971, midway during the 12th grade for a student who progressed "normally."

Combs, J., and Cooley, W.W. "Dropouts: In High School and After School." American Educational Research Journal 5 (1968): 343-363.

Program Description:

No programs, per se, were involved in this particular study. It focuses upon a subsample of the data from the

Project TALENT data base, which involved students from over 1,300 public and private high schools across the country.

Sample(s):

The primary samples for the study consisted of the 1,537 girls and 1,494 boys who were originally tested as 9th graders in the TALENT Project, but who did not complete high school (as determined by subsequent TALENT follow-ups). These samples were each contrasted with comparisonal "control" samples of girls and boys in the TALENT data base who completed high school but did not continue their education beyond that level. Twenty (20) percent of the females--1,847 students and 25 percent of the males--1,533 students from this subgroup in the total data base were randomly chosen to serve as "controls."

Instrument(s) and Point(s) of Measurement:

The Project TALENT tests that were employed as indicators of the designated students' basic skills were: English Total, Reading Comprehension, Introductory High School Math, Arithmetic Reasoning, and Arithmetic Computation. These tests were completed by the TALENT sample in 1960, when they were in the 9th grade. Information about the students post-high-school activities were obtained via a follow-up survey conducted in 1964. For those students in the "control" groups this would be one-year after high-school graduation. The "dropouts" could have been out of school for as many as four years.

Crawford, J. Project Emerge, Dayton, Ohio. 1973-74: Final Evaluation Report. Dayton, Ohio: Dayton Board of Education, 1974. (ED 094 097)

Program Description:

The report focuses upon the third year (1973-74) in which the designated, locally developed program was in operation. During that year the program provided students with counseling and social service (instruction via a reading lab) experiences in an occupational exploration laboratory shop experience, recreational facilities (student lounge), possible enrollment in an automotive professional training course, and/or job searching/ placement services. At the same time school-wide staff development and consultative services were provided by program personnel.

Sample(s):

The sample for which data were available (out of a total of 142 students), consisted of 115 students who participated in the CORE (activities) sponsored by the program during the 1973-74 school year. These students were diagnosed as potential high school dropouts using project-established criteria and were predominantly blacks, inner-city youth. The numbers of female and male students in the sample were not provided in the available evaluative documentation.

Instrument(s) and Point(s) of Measurement:

The primary "basic skills" criterion employed in the study was the Nelson Silent Reading Test. That instrument

was initially administered during the last week in September (pre-test) and again in mid-January (for those who exited the program after the first semester) and in mid-May (for those who remained in the program for a school year). The results were reported in terms of grade equivalency scores. (The students may or may not have participated in the reading laboratory and related instructional activities offered as part of the overall program.)

Dickerson, E. A Sheltered Workshop Experience Centered Vocational Curriculum for Low Achieving Students: Final Report. Sylacauga City, Alabama: Sylacauga City School District, 1973.

Program Description:

The Sylacauga Exemplary Project was in operation for three years. It centered around work experiences provided by the school system. Combined with this and related vocational instruction was a basic skills program based upon those skills needed on specific jobs. Over half the students also held part-time jobs. The schedule for a typical day might be as follows:

- Work experience--two and one-half hours
- Basic academic program--one hour
- Reading instruction--one hour
- Health and physical education--one hour
- Occupational information--one hour
- Lunch, group guidance, etc.--three-fourths hour

Sample(s):

The total sample reported was 89 students. These students, from grades 9 through 11, were deemed to be socioeconomically disadvantaged and dropout prone. Approximately 75 percent of the students were black, 35 percent were females, and they had reported IQ scores of 80 or less.

Instrument(s) and Point(s) of Measurement:

The reading, arithmetic, and language subscores from the California Basic Skills Test (CBST) were used as three of the major basic skills criteria. Complete data (reported) on those tests were available for only those students (n = 57) who participated in year two of the project. For these students the tests were administered at the time of entry into the program and again in the Spring of 1972.

Another "basic skills" measure employed with a subsample of participants was the Gates-Mac Ginitie Reading Test. Complete data on this test were available for 42 students. All students were posttested in May, 1973, however, the years when they received their respective pretests varied. More specifically, 26 were pretested in September 1970, four in September 1971, and 12 in September 1972.

Scores on both sets of criteria are reported in grade equivalency terms.

Hornbostel, V.D.; Egermeier, J.C.; Twyman, J.P.; and Wallace, G.R. The Rehabilitation of School Dropouts in Oklahoma City: An Experimental Appraisal Final Report. Stillwater, Oklahoma: Oklahoma State University, 1967. (ED 021 979)

Program Description:

The programs described were established in a large urban high school (Oklahoma City), and were designed to aspects of a multifaceted training program to different subgroups of participants. One treatment consisted of vocational instruction in combination with academic coursework, another consisted only of the vocational instruction, a third consisted only of the academic course work, and the fourth involved no training. On a daily basis the participants in the academic group were involved for three hours, those in the vocational group were involved for five hours, those in the academic-vocational group for eight hours, and those in the control group for zero hours. The total length of the actual training received ranged from 20 to 48 weeks.

Sample(s):

The four samples were assigned to their respective "treatments" using a combination of factors-interest, test scores, and number of openings. The resulting samples were:

- Academic-Vocational (AV) with n = 118
- Vocational (V) with n = 115
- Academic (A) with n = 59
- Control (C) (those assigned plus those who quit after finishing less than 15 percent of the program) with n = 46.

204

The overall sample was comprised of unemployed or underemployed high school dropouts between 17 and 22, who had been out of school for at least a year.

Instrument(s) and Point(s) of Measurement:

The primary basic skills measures employed were the Sequential Tests of Educational Progress (STEP)--reading, writing, and mathematics subtests. These measures were administered at program entry and again upon exiting from training. Follow-up data were collected at two points--12 months and 24 months after the completion of training.

Johnson, L. Minneapolis Edison High School Employability Skills Program: An Evaluation, 1972-73. Minneapolis, Minnesota: Minnesota Department of Research and Evaluation, 1973.

Program Description:

The program was focused primarily upon providing the students with instruction in English, mathematics, and social studies. Reading was also emphasized for those with very serious problems in that area. The related instructional materials were as individualized as possible and incorporated vocational awareness and orientation emphases. Other job-related materials were employed along with field trips to observe various work environments, "shadowing" workers on these jobs, and participation in a work experience program in a limited number of cases.

Sample(s):

Three samples were used in the study. They were:

- o ESP students (ESP)--n = 87;
- o ESP students who left the program (ESP-L)--n = 21; and
- o Comparison students, who were recommended for the program but chose not to participate (C)--n = 32.

The students in all three groups were deemed to be potential dropouts. Approximately two-thirds of them were male and one-third female.

Instrument(s) and Point(s) of Measurement:

The "basic skills" indicators available via this study were the Differential Aptitude Test (DAT) scores--Verbal and Numerical and the reading and English expression tests from the Sequential Tests of Educational Progress (STEP)-Series II. The DAT scores had been collected earlier, while the STEP scores were collected from students when they entered the program and again at the end of the year. In the case of the STEP tests the students raw scores and percentile scores (based on 9th grade fall norms and 9th grade spring norms, respectively) were reported.

Jones, H.B. Dropout Prevention: Diversified. Satellite Occupations Program and Career Development: Final Report. Salt Lake City, Utah: Granite School District, 1973.

Program Description:

This multifaceted program was entitled the Diversified-Satellite Occupations Program. It had the following four emphases:

- Occupational guidance, which focused upon upgrading the screening, testing, counseling, and placement opportunities for students.
- Work experience, which focused upon combining school and direct occupational experiences.
- Bilingual-bicultural, which focused upon activities designed to minimize the problems associated with such situations.
- Handicapped, which focused upon expanding and improving the opportunities afforded handicapped students.

Sample(s):

The total sample for the study included 180 potential and actual school dropouts or those in need of "specialized vocational services." This sample of high school students was distributed across three program sponsored "centers"--high schools. Seventy percent of the sample were boys and 30 percent were girls.

Instrument(s) and Point(s) of Measurement:

The Wide Range Achievement Test (WRAT, 1965 Edition) was used to indicate students' levels of oral reading, spelling, and arithmetic computation. These three scores were augmented by the "verbal" and "numerical" scores generated via the Fundamental Achievement Series (FAS). The content on these measures taps the knowledge and competencies that a job applicant may reasonably be expected to have acquired in the course of daily living and that

will be released for actual job performance. The FAS tests are administered orally via tape recordings. These (five) different basic skills indicators were administered to the students when they entered the program (September, 1972 or January, 1973), and again at the end of the 1972-73 school year.

Kelly, F.J.; Veldman, D.J.; and McGuire, C. "Multiple Discriminant Prediction of Delinquency and School Dropouts." Educational and Psychological Measurements 24 (1964): 535-544.

Program Description:

No programs as such were evaluated or directly addressed as part of this study. It focused upon describing and comparing the characteristics of the respective samples, not assessing the relative effects of the curricular programs in which they were enrolled.

Sample(s):

The total sample consisted of 201 male students from four nonurban Texas communities who were 7th graders during the 1957-58 school year when the criterion tests were administered. (A large number of the original population tested were excluded from the study due to indeterminant status--moved or location unknown.) This total sample consisted of the following groups:

- o Delinquents (DEL)--those involved in direct juvenile court action (n = 15).
- o Dropouts (DO)--those who leave school prior to successfully completing 12th grade (n = 25).

- Normals (NO)--those who are the attending-school population (n = 161).

Instrument(s) and Point(s) of Measurement:

The basic skills indicators selected from the battery of tests used in the study were the Sequential Test of Educational Progress (STEP) listening score and the California Test of Mental Maturity (CTMM) language score. These scores were obtained from the respondents during the 1957-58 school year when they were 7th graders. This initial testing session was followed-up four years later, during the Fall of 1962. At that time their criterion status (i.e., dropout, delinquent, or normal) was determined.

Custer, H.F., Jr. "The Martha's Vineyard Regional High School Case Program: An Historical-Assessment Study of Cooperative Vocational Education in a Semi-Rural, Isolated School District." Dissertation Abstract, University of Massachusetts, 1973.

Program Description:

Basically the program consisted of an upgraded curriculum for students in grades 10 through 12. That curriculum was separated into the following three sections:

(1) No work experience, classes in communication, math, social studies, science, typing, physical education, and basic vocational skill training all day.

(2) Supervised work experience on every other week and classes the remainder of the time--all day for each intervening week. Curriculum included communication

skills, mathematics, social studies, science, and advanced vocational skill training in specialized trades.

(3) Alternated work experience--classroom weeks with the students in section #2.

Sample(s):

The total sample of students involved in the study was 53. They were 15 to 21 year olds and had been classified as academically disadvantaged and dropout prone. Of this total, 16 had criterion scores on record for grades 7, 9, and 11, and had been enrolled in the program for two full years. This subsample of 16 students served as the "experimental" group for the study. A "comparison" sample of 16 students was also identified for whom the indicated criterion scores were also available. These students were matched with members of the "experimental" group on such variables as age, sex, and IQ.

Instrument(s) and Point(s) of Measurement:

As noted above, the criterion scores were obtained for each student at the end of the 7th, 9th, and 11th grades. The criteria employed were the Stanford Achievement Test (SAT) percentile rank scores in mathematics and reading. These scores were collected for the 11th graders at the end of the 1970-71 school year.

Langsdorf, M., and Gibboney, R.A. The Career Intern Program: Final Report. Volume I: An Experiment in Career Education that Worked. NIE Papers in Education and Work: Number Seven. Elkins Park' Pennsylvania: Gibboney Associates, Inc., 1977. (ED 142 795)

Program Description:

The Career Intern Program (CIP) described combines basic and career education for high school youth. It attempts to systematically merge academic and career preparation, provide career exploration alternatives, provide in-depth knowledge of how the world of work operates, and prepare affected students for entry into a career.

Sample(s):

The study dealt with two samples--a "program" group, whose members were exposed to the CIP for a year to a year and a half, and a "control" group, whose members completed the pre-tests/applications but were not (randomly) selected to receive the program. Most of the sampled students were 16 or 17 years old and were either potential or actual high school dropouts. About half of them were male and half female. The specific numbers of students for whom basic skills criterion data were available were as follows:

- o "Program" sample--88 students
- o "Control" sample--55 students

Instrument(s) and Point(s) of Measurement:

The basic skills criterion measures employed during the study were the reading and mathematics tests from the

Stanford Achievement Test (SAT) Battery. The resulting data were reported in both raw score and grade equivalent form. The tests were administered at the time the students entered the program and again when they exited. The average time between fore- and front testing for all the sampled students was approximately eight months.

Center for Field Research and School Services. An Evaluation of the High School Redirection Program. State Urban Education Program. Brooklyn, New York: New York City Board of Education, 1973. (ED 091-454)

Program Description:

The High School Redirection Program was designed to maintain potential dropouts in an educational-vocational setting and to assist them in progressing toward a high school diploma. The program involved a work-study component for a summer and selected classes for academic credit and paid work experiences (during alternate weeks) for a school year. During the course of the program the associated activities focused on academic and occupational skills training, remedial instruction, job orientation, and guidance. During the work experience component students were trained, supervised, and evaluated on the job.

Sample(s):

A total of 240 students were involved in the program during the 1972-73 school year, when the evaluation was conducted. Of this total 214 had complete data on one of the criterion measures (reading) and 165 had complete data on the other criterion (mathematics).

212

Instrument(s) and Point(s) of Measurement:

As indicated above, data on two basic skills criteria were collected and reported in the study. The related tests were as follows:

- o Reading--California Reading Test
- o Mathematics--California Achievement Test (CAT).

These criterion instruments were administered to the program participants upon entry into the program and again at the end of the evaluation period--one summer plus an academic year. The posttests were administered at the end of the 1972-73 school year. (Note: The reading criterion was also completed at an earlier time to the students and the associated scores were taken from their school records.)

Redfering, D.L., and Cook, D. "Relationships Among Vocational Training, Income, and Job Complexity of High School Dropouts and High School Graduates." Journal of Vocational Behavior 16 1980): 158-162.

Program Description:

No program, per se, was considered as part of this study, the primary purpose of which was to assess the long range effects of dropping out of high school.

Sample(s):

The samples employed in the study consisted of 100 high school dropouts and 100 high school graduates. Half of each sample was male and the other half female. In addition, half of each group had received some form of vocational training (not a college curricula) after

leaving high school. The samples were selected from over 5,000 applications to the State Employment Service in a small Florida city. The median age of the members of each of the groups was 37.

Given the approach used to identify the designated samples, their representativeness of the population in general could be questioned, i.e., they only represent persons who made at least one visit to the designated State Employment Service office(s).

Instrument(s) and Point(s) of Measurement:

No instruments as such were employed in the study. The primary data source was the records maintained by the State Employment Service. The two criteria derived from these records were:

- o Annual income--which was calculated for the year prior to the applicants completing their applications.
- o Job complexity--which was determined by identifying the last three digits of the DOT code, which described each subject's present or immediate post occupation.

Sharar, P.H. "Changes in the Social Adjustment of Disadvantaged Male High School Dropouts as a Result of Vocational Training and Employment." Ph.D. dissertation, Columbia University, 1974.

Program Description:

The program, entitled Training Resources for Youth (TRY), afforded trainees an opportunity to receive training in seven occupational clusters and some 50 specific jobs. Half of each day in the program was spent

in occupational training and the other half in a life skills education component. The life skills component included basic skills development, counseling, and a curriculum designed to help the participants deal with the problems confronted in living in a city. All the trainees received an MTP training allowance.

Sample(s);

All the trainees were unemployed high school dropouts between the ages of 17 and 21. Furthermore, they were all males and black. Those in the "program" group participated for an average training period of eight months, while those in the "control" group only completed the program orientation session and no training. Of the 260 eligible "program" participants, 30 were randomly selected for analysis purposes. The 30 "control" group members were randomly selected from 96 persons who attended only the orientation period.

Instrument(s) and Point(s) of Measurement:

The trainees were initially tested during the Spring and Summer of 1967. At that time they were administered the Metropolitan Achievement Tests (Intermediate Series)--Reading. Then, in 1969, the random samples were identified and follow-up conferences conducted. Several "outcome" criterion data collected at the time of the follow-ups were: number of weeks worked (in a year); weeks spent in additional training, weeks spent in military, number of weeks unemployed (in a year); number of jobs held; longest job; average weekly pay; etc.

Spotts, R., and others. Evaluation of the Greenhouse Program 1977-78. Experience-Based Career Education. San Francisco: Far West Laboratory for Educational Research and Development, 1978. (ED 170 052)

Program Description:

The program used was the Experience Based Career Education program (EBCE) developed by the Far West Laboratory. This program involves a component directed toward improving students' basic skills, career decision making ability, self reliance, etc., as well as a work study component designed to provide students with opportunities to improve their overall understanding of specific job requirements and of the world of work more generally.

Sample(s);

The two primary samples included in the study were a "program" group (students who were starting the program during the "test" year--self-selected and referrals) and a "comparison" group (students who were identified as potential students for the program, but chose not to participate). The sample sizes for these two groups were as follows:

- o "Program"--46 students
- o "Comparison"--23 students

The students included in the study were "disaffected" high school students (potential dropouts), half of whom were female and half male.

Instrument(s) and Point(s) of Measurement:

The basic skills measures employed in the study were the Science Research Associates (SRA) Survival Skills Tests-Reading and Mathematics. These measures were administered to the students at the times when they entered the program (Fall or early Spring of the 1977-78 school year) and again at the end of the 1977-78 school year. In all, the evaluation period addressed by the study was approximately one school year in length.

Stein, E.M.; Ball, H.E., Jr.; Conn, G.T.; Haran, J.; and Strizver, G.L. "A Contingency Management Day Program for Adolescents Excluded from Public School." Psychology in the Schools 13 (1976): 185-191.

Program Description:

The program focused upon integrating vocational training with academic instruction that was geared toward the students' acquisition of the skills needed for employment. The prime motivational agent employed was contingency controlling, which represented an agreement between students and staff that reinforcement/rewards would be contingent on specified student behaviors. The provisions of clinical services with students and their families as well as inservice training for participating teachers were also part of the overall program.

Sample(s):

The students served by the project were male adolescents who had exhibited severe behavior problems in the regular classroom and had or were in the process

of being expelled from school. The average IQ of the students was 80 and their average reading level was 5th grade. The study reported data for the first two years of the study. Although the project served a total of 44 students during the two years cited (22 students per year), complete basic skills data were reported for only 16 of the 22 students served in year two. It was indicated that gains occurred in year one, but those gains were not significant and they were not reported.

Instrument(s) and Point(s) of Measurement:

Students' basic skills levels were assessed at the beginning and end of the school year. The related instrument was the Peabody Individual Achievement Test (PIAT)--Math, Reading Recognition, and Reading Comprehension students. Pre- to posttest increases in these various criteria were evaluated via a series of t-tests.

Walther, R.H., and Magnusson, M.L. A Study of the Effectiveness of Graham Associates' Demonstration Project on Education Programming in Manpower Training Projects. Washington, D.C.: Manpower Research Projects, The George Washington University, 1975.

Program Description:

The program under evaluation is the New Education Program (NEP) developed by Graham Associates for use in providing learning experiences in a variety of situations outside the school mainstream. The NEP is an adaptation and refinement of the Job Corps Programmed Learning System used in two neighborhood youth corps programs, on underachieving 9th graders, and on MDTA skills center.

Sample(s):

The program was utilized and evaluated in five diverse sites--a juvenile detention facility, a 9th grade class in an urban setting, an MDTA skills center, and two Neighborhood Youth Corps (NYC) programs. The associated sample sizes (i.e., participants for whom data were available) were as follows:

- o Juvenile detention facility--132 subjects
- o Ninth grade class--16 subjects
- o First NYC program--39 subjects
- o Second NYC program--39 subjects

Approximately half of the sample students in all of the sites but the retention facility were male and half were female. In that site all the participants were males. The average age across sites was approximately 17 years of age.

Instrument(s) and Point(s) of Measurement:

The subjects' basic skills were assessed using the Stanford Achievement Test (SAT)--Reading and Mathematics. The subjects were initially tested at program entry and at approximately three-month intervals thereafter. Fifty-six percent of all the subjects were retested at least once. Data collection began in the Fall of 1973 and ended in 1978.

Evans, F.R., and Patrick, C. "Antecedents and Patterns of Academic Growth of School Dropouts." In Study of Intellectual Growth and Vocational Development: Final Report, edited by T.L. Hilton. Princeton, New Jersey: Educational Testing Service, 1971. (ED 056 063)

Program Description:

No program, per se, was being utilized or evaluated as part of this particular study. Instead, the focus was upon investigating some of the achievement and aptitude variables (at the fifth grade level) which served to discriminate between dropouts and nondropouts.

Sample(s): Two samples were employed in the study. They were dropouts (n = 68) and nondropouts (n = 81) from a Northeastern urban school system who were tested as part of the overall Academic Growth Study. The samples were identified using available school records and tests records generated as part of that study. After the sample of dropouts was identified the "comparison" or nondropout sample was selected. They, as a group, matched the dropouts on sex, race, and the elementary school they attended in the fifth grade.

Instrument(s) and Point(s) of Measurement:

The basic skills measure used in the study was the Sequential Test of Educational Progress (STEP)--Mathematics, Reading, Listening, and Writing Tests. These criteria were administered to the dropouts on two occasions (1961 and 1963) and to the nondropouts on three occasions (1961, 1963, and 1967). At those points in time the dropouts were 5th and 7th graders, respectively, and the nondropouts were 5th, 7th, and 11th graders, respectively.

APPENDIX E-1

Characteristics of Potential Dropouts or Dropout-Prone Students

Study	Cognitive	Affective	Other
Hilda Jones (1973)	1. seldom equipped or prepared to function successfully when in attendance	1. inordinately sensitive to comments or criticism about self or habits	1. by nonattendance, is seldom enrolled in vocational education classes
Hilton (1971)	1. grade retention 2. reading achievement, spelling achievement, and word discrimination in the second grade were below average		1. attendance records in grades 1-3 showed a positive correlation between number of absences and later withdrawal—dropouts were absent three times as often as graduates (35.2 days to 11.7 days)
Custer (1973)	1. at least one year behind grade level 2. achievement significantly below grade level in mathematics and reading	1. demonstrates failure syndrome—habitually refuses to try because failure is automatically anticipated 2. manifests low self-esteem 3. displays active dislike of school 4. vocationally inclined—shows a marked preference for manual skills 5. categorized by teachers as uncooperative/inattentive and unmotivated	1. poor attendance records 2. record of frequent disciplinary infractions
Walters and Kranzler (1970)			1. accurate predictions of potential dropouts can be made as early as the beginning of the ninth grade using only data available on cumulative records 2. combining variables (characteristics) is a more accurate predictor than any single variable 3. IQ appears to be < significant in early identification than implied in the literature 4. reading is somewhat overrated as a predictor 5. no combination of variables is an efficient predictor if SES is omitted

(continued)

APPENDIX E-1 (continued)

Study	Cognitive	Affective	Other
Walters and Kranzler (1970) *(continued)*			6. age is underrated as an important predictor 7. arithmetic appears to be more important than some of the more frequently mentioned variables 8. most accurate predictive combination includes • age • IQ • arithmetic achievement • father's occupation
Vogel (1961)	1. by seventh grade student is a year or more below grade level in arithmetic and reading; student not keeping up academically 2. failure in one or more years of elementary or secondary school; failure most frequently occurs in grades one, two, eight, and nine	1. sense of not belonging; alienation or separation; isolation 2. difficulty in adjusting to high school; does not participate in school affairs	1. attendance at several elementary schools; student never develops a sense of belonging 2. newcomer—either rural to urban or urban to rural contributes to sense of loneliness 3. low SES frequently accompanied by a lack of parental emphasis on education 4. broken home—family tensions leading to emotional difficulties 5. irregular attendance pattern in high school, usually accompanied by low grades 6. community problems—difficulty with police or other community agencies 7. females tend to go steady with older males who may leave school (then they no longer "fit in") 8. males tend to drop out to support car ownership

APPENDIX E-1 (continued)

Study	Cognitive	Affective	Other
Crawford (1974)	1. stanines of four or less on the reading or mathematics achievement sections (or both) of the *Ohio Survey Test* 2. trend of declining grades	1. poor behavior	1. above average absenteeism (20+ days) 2. referral by counselor or self-referral
Porter (1963)	1. academically below average; a poor reader	1. likely to reside in a homogenous area of low socioemotional status 2. cannot see the potential of education as a means to vocational success 3. does not have the skills, sense of responsibility, personal, and social adjustment necessary to hold a part-time job while in school, nor to obtain a good job after leaving school 4. lacks the ability to gain status; is socially immature, irresponsible, defensive, and pessimistic about own vocational future 5. is either socially withdrawn or socially aggressive, lacks friends and is not a *constructive* leader 6. clash with certain middle-class teachers who reject them either socially or academically 7. often exhibits a dislike of the school situation 8. system of values lead to rejection of school, self, and competitive situations 9. frustrated and socially insecure in school situation	1. tend *not* to be juvenile delinquents 2. only 8 percent of the parents of potential dropouts hold jobs that are not semi-skilled or unskilled 3. the majority of the potential dropouts live in "less desirable neighborhoods" 4. home environment and number of years of schooling completed by parents have a major influence on who *stays* in school 5. the percentage of male potential dropouts is slightly > than percentage of females 6. minorities tend to drop out proportionately in > numbers in large urban areas 7. does not hold one job for long and has a poor work record 8. seldom participates in extracurricular activities 9. if female, likely to marry early and to be sexually precocious 10. often absent from school 11. cannot find a suitable training program in school to meet own needs 12. parents are indifferent to student's persistence in school

APPENDIX E-1 (continued)

Study	Cognitive	Affective	Other
Randolph and Holmes, eds. (1973)	1. below grade level in reading 2. overall low achievement 3. shows lack of goal orientation	1. leave elementary school psychologically before they leave secondary school physically 2. does not attain socially acceptable rewards in elementary school, therefore has difficulty meeting academic and social standards of environment 3. experiences status deprivation because of poor relationships in academic setting 4. inattentive and may be classified as a "troublemaker" 5. displays social, emotional, or organic behavioral problems 6. displays overt disruptive behavior 7. shows signs of insecurity or withdrawal; feels inadequate 8. is antisocial; does not participate in school activities 9. has problems with peer interaction; prefers to play alone; negative toward peers 10. experiences depression, which teacher may interpret as indifference toward school in general 11. dislikes school and categorically rejects rules	1. some believe that seventh grade is the last grade at which dropouts may be salvaged; best is fifth or sixth grade 2. overage for grade level 3. chronic absenteeism 4. low SES background
Brantner and Enderlein (1972)	1. retarded or slow readers 2. two year retardation in reading and math skills 3. mean IQ of 90	1. indifferent to the value of school 2. lost interest in school and are not accepted by teachers	1. overage for grade level 2. irregular attendance 3. low parental educational attainment 4. minimal family participation in community activities 5. poor or low family economic status 6. poor family attitude toward school 7. frequent absenteeism because they come from a transient family 8. experienced early marriage 9. gender is *not* a significant variable in predicting dropout

APPENDIX E-1 (continued)

Study	Cognitive	Affective	Other
Lary Johnson (1973)	1. tended to take general math rather than algebra 2. received lower than average grades in ninth grade English, social studies, and mathematics 3. seldom questioned or reasoned critically	1. little to no involvement in classroom discussion and activities 2. tended not to accept responsibility for completing work or studying independently 3. exhibited no leadership qualities; were passive or conformist	1. more males than females 2. more often than not had both parents in the home 3. had poor to mediocre attendance records
Karnes et al. (1966)	1. classified as slow learners (IQ 75-90) 2. inadequate communication skills 3. below grade level achievement 4. low grades	1. are alienated 2. manifest dislike of textbooks 3. poor social and emotional adjustment 4. poor work habits, powers of concentration 5. lack of sustained interest—easily discouraged	1. low SES

APPENDIX E-2

Characteristics of Dropouts

Study	Cognitive	Affective	Other
Thornburg (1974)	1. limited formal education 2. poor academic success 3. low intelligence scores [Voss (1966) reported that 46 percent of the high school dropouts' IQ scores were < 90.] 4. has not established well-defined goals 5. low scholastic aptitude	1. tend to be loners 2. tend to exhibit > dissatisfaction with social relationships in school than graduates 3. reject school and self 4. feel unsure about school status 5. less respected than other students by teachers 6. considered a school social problem 7. often hostile toward others	1. age: 16 to 16½; tend to be average 2. gender: more males than females 3. low SES contributes to deficit in basic learning proficiencies before entry 4. lack of appropriate curricula, in the case of the 54 percent whose IQ scores were > 90 5. tend to come from low-income families in which neither parent finished high school 6. tend to belong to a racial minority and to live in substandard housing
Sewell, Palmo, and Manni (1981)	1. lower average IQ 2. poor academic performance resulting in restriction of grade promotion	1. poor self-concept 2. feeling of helplessness in determining one's destiny 3. feelings of alienation from school	1. tend to gravitate toward occupational status of parents, and low SES dropouts become convinced that the educational process will eventually relegate them to the unsatisfying work status of parents, regardless of cognitive or affective characteristics
Brantner and Enderlein (1972)	1. failing or discouraged with school work 2. two year retardation in reading or math skills 3. a mean IQ of 90 4. 90 percent have repeated at least one grade 5. display great disparity with graduating peers in cognitive aptitudes— Intelligence Verbal Numerical 6. male dropouts and graduates best differentiated by arithmetic and language test scores *(continued)*	1. burdened with a feeling of not belonging 2. dissatisfied with current teaching methods 3. dislike of school 4. loss of interest in school 5. not accepted by teachers 6. predilection for nonprofessional vocations such as labor, skilled trades, or music 7. male dropouts of high ability tend to be socially oriented, to seek social recognition, to dislike school's pressure to conform 8. female dropouts same as above except for those that withdraw to marry—they tend to be less socially oriented	1. 16 to 17 years of age 2. from a low-income family 3. willing to leave school for a job 4. from a weak or broken home 5. early marriage 6. parental attitude of expecting student to work at home, help support the family, or both 7. poor family attitude about school 8. tend to foresee education as *not* preparing them for world of work 9. cannot resist illusory independences symbolized by second-hand car *(continued)*

APPENDIX E-2 (continued)

Study	Cognitive	Affective	Other
Brantner and Enderlein (1972) *(continued)*	7. female dropouts and graduates best differentiated by grade point average		10. greatest percentage of dropouts is in the general curriculum (both male and female) 11. male dropouts and graduates best differentiated by age, number of siblings, and occupational level of father 12. female dropouts and graduates less differentiated by number of absences, age, number of siblings, and marital status of parents 13. parents may have *wanted* dropouts to stay in school, but did not *force* them to 14. dropping out is a symptom of other problems rather than a basic problem; it is symptomatic of certain background and ability characteristics, school experiences, and traits of personality and behavior
Hilton (1971)	1. dropouts have been retained four times as frequently as graduates		1. tend to have been older when they *entered* school
Vogel (1961)	1. grade retardation of at least two years, particularly in reading and arithmetic skills 2. pattern of academic failure 3. majority have an IQ of $\geqslant$ 90; 10 percent test at an IQ of $\geqslant$ 110	1. family tensions cause emotional difficulties that lead to failure at school 2. feelings of loneliness and isolation 3. significant lack of motivation overriding the significance of lower average IQ 4. feelings of not being accepted by teachers and peers and believing that acceptance will be found in the world of work 5. fear that opportunities are not open to members of their group	1. parents and relatives place no value on education, and even pressure the student to stop "wasting time at school" and to find a job 2. family economics may mean that finding a job is an absolute necessity, or may cause dropout because (females more often than males) cannot "keep up" with peers 3. tend to be members of minority groups 4. attendance problems due to transient family, ill health, or truancy 5. early marriage or pregnancy leading to marriage

APPENDIX E-2 (continued)

Study	Cognitive	Affective	Other
Huber (1963) (a study of females only)	1. poor study habits	1. lack of interest in school or classwork 2. limited interests—a survey of female dropouts revealed that 87 percent listed going steady or planning marriage as their only interests	1. pressure from parents and school personnel to take specific courses 2. parents tended to favor their dropping out of school 3. tend to experience frequent periods of unemployment 4. > 50% indicated that the consequences of dropping out were explained to them before they withdrew from school
Langsdorf and Gibboney (1977)		1. lower self-satisfaction and personal growth	1. dropping out affects • ability to find a job • upward mobility • income • job satisfaction • quality of working life 2. tend to find lower-paying, lower status jobs 3. tend to be *more* satisfied with those jobs, as they grow older, than completors 4. tend to regret missed opportunities for educational development 5. dropping out is culturally selective—it hits low-SES minority persons hardest
Combs and Cooley (1968)	1. tend to rank consistently lower than completors in terms of academic ability and IQ 2. there is a small but consistent percentage of dropouts with above average ability. This study reports • 19% of a 1964 sample of 21,497 dropouts with IQs between 90 and 109 • 11% with IQs of 110+	1. tend to score significantly higher than graduates on interest inventories in labor, skilled trades, and music 2. males expressing an interest in sports are less likely to drop out 3. dropouts tend to exhibit greater leadership and impulsiveness than completors 4. over half of this dropout sample reported regret over the decision to leave school	1. authors report that the socioeconomic environment variable was not a statistically significant determinant, i.e., economic conditions in the home did not appear to be forcing students to leave school in their first sample (1960) 2. SES in the second sample was more markedly different between leavers and completors, but statistical significance was > as a reason for dropping out for females than males (1964)

APPENDIX E-2 (continued)

Study	Cognitive	Affective	Other
Karnes et al. (1966)	1. tend to be classified as slow learners (IQs from 75-90) 2. fail to meet standards of learning in the school 3. lack of "success" experiences in school 4. they do not possess the vocational skills needed to meet the demands of available jobs given rapidly changing technology	1. fail to meet standards of acceptable behavior 2. they are alienated, i.e., alien to the larger society in which they live 3. they are misfits—hostile and unruly or passive and apathetic 4. they have dropped out psychologically 2-3 years before they dropped out physically 5. they seek release from a "punishing" environment by dropping out	1. are culturally disadvantaged 2. they are "shoved" out of school and into the community where they are likely to meet with employment failures and remain among the unemployed and unemployable
Porter (1963)	1. academically below average; a poor reader	1. likely to reside in a homogeneous area of low socioemotional status 2. cannot see the potential of education as a means to vocational success 3 does not have the skill, sense of responsibility, personal, and social adjustment necessary to hold a part-time job while in school, nor to obtain a good job after leaving school 4. lacks the ability to gain status, is socially immature, irresponsible, defensive, and pessimistic about own vocational future 5. is either socially withdrawn or socially aggressive, lacks friends, and is not a *constructive* leader 6. if female, likely to marry early and to be sexually precocious 7. clash with certain middle-class teachers who reject them either socially or academically 8. often exhibit a dislike of the school situation 9. system of values leads to rejection of school, self, and competitive situations 10. frustrated and socially insecure in school situation	1. does not hold one job for long and has a poor work record 2. seldom participates in extracurricular activities 3. often absent from school 4. cannot find a suitable training program in school to meet own needs 5. parents are indifferent to student's persistence in school

APPENDIX E-2 (continued)

Study	Cognitive	Affective	Other
Smith, Tseng, and Mink (1971)	1. lack of success in schoolwork as demonstrated by retention in one or more grades, failure, reading difficulties, low IQ, low mathematics and reading ability		1. lack of participation in extracurricular activities 2. family and friends place a low value on schooling 3. difficulty in meeting school costs 4. general socioeconomic factors such as • occupation of head of household predominantly unskilled or semi-skilled • parents' education: ninth grade or less 5. irregular attendance 6. lack of social life
Neill (ed.) (1979)	1. have average or slightly below average intelligence 2. are low or underachievers academically 3. do not read at grade level 4. fail more grades than peers 5. cannot communicate adequately either verbally or in writing	1. are discipline problems in school 2. feel rejected by school and reject it in turn 3. tend to exhibit behavioral problems or social withdrawal 4. tend to be loners; not generally accepted by peers	1. tend to be more mobile than other students 2. tend to come from low-income families 3. have absenteeism or truancy rates 4. do not participate in extracurricular activity 5. have frequent health problems 6. poor communication between home and school 7. one or more parents did not finish school 8. an older sibling is a dropout 9. friends are out of school, usually older dropouts 10. peak age for dropout is 16 11. highest incidence of dropout is in ninth grade, followed by eighth and tenth 12. likely to be a member of a racial or ethnic minority 13. more likely to be male than female if over age 16 14. if reentering, tend to be young (15.7 years mean age) and female and usually reenter grade 10 or 11

APPENDIX E-2 (continued)

Study	Cognitive	Affective	Other
St. Paul, Minnesota Public School (1980)	1. is reading poorly and showing no improvement 2. is receiving low grades in academic or school subjects	1. shows little or no interest in school	1. has high rate of absenteeism 2. is more economically deprived than classmates 3. is older than classmates

APPENDIX E-3

Validation of Dropout Characteristics Through Self-Reporting

Study	Self-Reporting — Reasons for Dropping Out
Thornburg (1974)	1. not interested in school 2. preferred to work 3. needed to supplement family income wanted to marry (male); pregnant (female) 5. wanted to enlist in military
Combs and Cooley (1968)	1. lack of interest in school 2. lack of scholastic success 3. cost 4. marriage/pregnancy 5. institutionalization 6. military service
Smith, Tseng, and Mink (1971)	1. lack of interest 2. lack of scholastic success 3. cost of going to school and other economic reasons 4. marriage 5. pregnancy 6. committed to an institution 7. military service 8. poor health 9. parental indifference 10. misbehavior 11. emotionally disturbed 12. lack of suitable programs 13. socially maladjusted
St. Paul, Minnesota Public Schools (1980)	1. left school at end of compulsory attendance period because of school problems 2. left school because of economic problems 3. placed in a correctional institution 4. entered the military 5. married 6. was expelled 7. was pregnant

APPENDIX F-1

Strategies for Dropouts

Study	Content	Methodology	Organization	Facilities
Austin and Sommerfeld (1967)	1. lists both *general and specific objectives* for training courses in basic communications and basic computations; includes detailed topical outlines 2. utilized standard *norm-referenced tests* to evaluate student progress. i.e., GATB (General Aptitude Test Battery); also WISC, WAIS, and WRAT Scales, other standardized personality measures	1. an *integrated* program designed to improve overall employability, to prepare clients for specific employment, and to increase basic skill achievement simultaneously with improvement in general training and employability 2. *instructional modes or methods* — the program began with a two-week orientation provided to trainees by representatives of local agencies who discussed opportunities for and future goals of trainees. During the first six months, trainees spent four hours in specialized training in reading, writing, speaking, and computation, in addition to training in personal health and habits and job orientation. Counseling sessions covered a variety of topics including current events, family problems, citizenship, budgeting, home management, personal relationships, and field trips to local businesses. The second program period entailed specific occupational training (trainees spent six hours a day in shop and one hour each in related math and communications techniques). Some vocational programs provided on-the-job training. In all cases, staff attempted to tailor both academic and occupational training to individual trainee needs, so that the *interaction of learner characteristics with techniques of program delivery* was generally favorable to overall improvement of trainees. 3. *materials* — No information was provided.	1. *staff* — consisted of six women and twelve men who were — vocational instructors — academic instructors 2. *staff qualifications* — • vocational instructors were successfully employed in subject area taught prior to delivery of services • academic instructors were successful high school teachers before coming to skill center • all counselors but one (a past employee of the state employment office) were previously high school counselors 3. *program duration* — minimum of four months and an average of nine months — phase 1: ½ day spent on basic skills and ½ day spent in various occupational training areas — phase 2: 6 hours in shop or occupational training and 2 hours of related math and communications training 4. *support services* — orientation provided by speakers from local agencies 5. 278 students participated in the Muskegon Skill Center; they were classified as disadvantaged according to the DOL definition (they were dropouts) 6. *program context* — operated in a separate facility, the Muskegon Area Skill Training Center, under the auspices of the MDTA 7. *environmental context* — urban (Muskegon, MI)	1. the program was separately housed in Muskegon Area Skill Training Center. No details of the physical plant were provided.

APPENDIX F-1 (continued)

Study	Content	Methodology	Organization	Facilities
Carlson (1979)	1. lists *specific goals and objectives,* both for students and for the project— • student — enhance self-concept, set and develop personal goals, relate to others, eliminate sex role stereotyping, improve life and basic skills, understand job clusters and families, and develop expertise in consumerism • project — involve the community in the educational process, facilitate decision-making, and develop a transportable experience-based career education model 2. provides training for improvement in reading, mathematics, and oral and written communication skills 3. utilized *norm-referenced tests* to evaluate skill levels, i.e., the Wide Range Achievement Test (WRAT), the Gray Oral Reading Test, the Cambridge Introduction to Arithmetic Diagnostic Test, and the English 2600 Series by Harcourt, Brace and World. These same measures were readministered as post-tests to measure improvement.	1. an integrated program in which most students received daily instruction in one or more basic skills areas, in addition to participating in career exploration activities provided either on-site by community employers or at the project site. In most cases, basic skills improvement was linked to the student's pursuit and completion of the GED or equivalency degree or by earning high school credit. 2. no information was provided on specific *instructional modes or methods* 3. *materials* used included competency units developed with input and assistance of community employers; in addition, a series of cassette learning packages covering work-related basic skills was purchased 4. the *learning process* employed was experience-based career education with additional instruction in the basic skills areas 5. the *interaction of learner characteristics with techniques of program delivery* was based on the development of individualized learning techniques that took into account each student's unique learning rate and style	1. *staff and staff qualifications* were not described, with the exception of community employers who were utilized as instructors at job sites 2. *program duration* — program duration was not described; the Pathfinder project itself lasted three years 3. *support services* — students were informed of assistance available through the state job service and job bank listings and were taught to utilize these services. They were also made aware of the services of agencies such as the Vocational Rehabilitation Office, Social Services, Mental Health Services, CETA, and the Bureau of Apprenticeship and Training 4. *primary actors* — 330 students were served by the program, which sought to teach dropouts, those who had not made career decision, the handicapped adults reentering the labor market, and those with deficiencies in the basic skills or in employability 5. *program context* — operated within the local school district and at various job sites throughout the community 6. *environmental context* — primarily rural with an undiversified agricultural economy	1. the *locus* of the program was not described

APPENDIX F-1 (continued)

Study	Content	Methodology	Organization	Facilities
Besant (1969)	1. lists no written *general or specific objectives* for a curriculum that included basic skills improvement in mathematics, language, and social studies. The goal of the Job Corps Center program was to increase basic skills achievement from the seventh-grade level to the ninth- or tenth-grade level. Included no *detailed topical outlines* 2. program description did not indicate the use of either norm-referenced or criterion-referenced measures to evaluate student progress	1. an integrated program described as a "continuous progress curriculum" (rather than a Carnegie unit pattern) that included approximately twenty-one weeks of instruction in mathematics, language, and social studies in addition to training in various vocational areas 2. *instructional modes or methods* – group instruction with individualized instruction provided on the basis of each trainee's individualized program. Individualized instruction was employed primarily for remedial work on an as-needed basis. Counseling was intensive, personalized, realistic, and focused on all aspects of the student's life. *All* staff members were involved in the counseling process. Curriculum was modified and adapted unit by unit to allow for flexible timelines. 3. *interaction of learner characteristics* with techniques of program delivery was generally favorable to overall improvement of trainees' basic skills and employability. Of particular interest is the fact that trainees aspired to middle-class values and status, an attitude unexpected by staff. These aspirations seemed to further trainees' progress. 4. *materials* – no specific information was provided	1. *primary actors* – male, primarily of minority origin; most were dropouts and came from broken homes 2. *staff and staff qualifications* – described as "master teachers" assisted by young, inexperienced tutor/counselors. In addition, the counseling staff consisted of a head counselor, senior counselors, and a counseling specialist. Teaching staff was a mix of skilled and untrained teachers. 3. *program context* was a Job Corps Center that included environmental control through an in-residence requirement 4. *program duration* – the center was in operation for three years; students spent six to nine months in class and three months in on-the-job training on average 5. *support services* – advice was provided to staff by representatives of the data processing, offset printing, and distributive trades 6. *environmental context* – urban (New Bedford, MA)	1. the *locus* of the program was the Rodman Job Corps Center in an urban area of a northeastern state

APPENDIX F-1 (continued)

Study	Content	Methodology	Organization	Facilities
Ware (1975)	1. lists no *specific objectives* for the program 2. no *instruments* were used for pre- or post-testing students	1. a *non-integrated* program predicated on remediation through individualized instruction in art, business, home economics, language arts, mathematics, science, and social studies. Students also receive "coordinated vocational academic education." 2. *instructional modes or methods* — each program area provides instruction on the basis of individual student need through an "individualized program of work." Students sign in and out for work in subject areas as they would on a job. Attendance is not monitored in the traditional manner. Students select a topic for study from prepared "opportunity sheets" and must complete twelve topics in one semester. 3. *interaction of learner characteristics with techniques of program* — students sign learning contracts in which they list their objectives in behavioral terms and identify, describe, and write goals. The learning contract techniques elicits generally favorable or positive responses from students because they feel that they can control their own learning experiences. Flexible scheduling also contributes to program success because students feel less threatened by competition with peers and learn to manage their own time. 4. *learning process* employed was individualized instruction in an alternative school setting to remedy low basic skills achievement. 5. *materials* - programmed instruction books, filmstrips with activities, quizzes, and questions, simplified learning packages, booklets with photographs, and actual laboratory experiences	1. *staff* — consisted of academic and vocational teachers. Teachers provide guidance to students through ongoing diagnosis of student needs and prescription of appropriate instructional materials 2. *staff qualifications* — not mentioned 3. *program duration* — appears to be a full-year program 4. *support services* — not mentioned 5. *primary actors* — maximum of 350 students at each of four centers to maintain a pupil-teacher ratio of about 15:1 6. *program context* — four separate centers that function as alternative schools 7. *environmental context* — urban (Dallas, TX)	1. *locus* of the program — four separate, leased facilities primarily in the central city area

APPENDIX F-1 (continued)

Study	Content	Methodology	Organization	Facilities
Brown (1970)	1. lists no *general* or *specific objectives;* however, the program's philosophy includes helping students to analyze themselves honestly, restoring a sense of self-worth and confidence, providing them with salable skills, and increasing job opportunities 2. program description did not include the use of *norm-referenced* or *criterion-referenced* measures of student progress 3. no *topical outlines* were provided; however, nineteen vocational training areas offered through this program are listed	1. a *remedial* program designed to upgrade the basic skills achievement levels, increase the employability, and facilitate the placement of the clients of this MDTA program 2. *instructional modes or methods* — the first six to twelve weeks, depending on individual performance level, are devoted to basic education classes in reading, arithmetic, library use, and attitudinal improvement. The following three weeks were spent in prevocational experiences through which students rotated through all vocational classes before selecting an area of concentration. Staff provide psychological counseling and aptitude testing to assist the student with vocational choice. Vocational training occupies the remaining 25 weeks. 3. *interaction of learner characteristics with techniques of program delivery* — was generally favorable to improvement of clients' basic skills achievement and to job placement. Program is predicated on the transformation of failure and inability to succeed to a positive attitude and "self-help" to success. Program rationale is to remove psychological crutches, thereby increasing students' self-respect. 4. *materials* — not mentioned 5. *learning process* — basic education courses integrated with psychological counseling and attitudinal improvement through self-questioning	1. *primary actors* — approximately 262 students between eighteen and thirty-five years old, functioning at third grade level, and either unemployed or underemployed, both male and female, completed this program each year of its three-year span 2. *staff and staff qualifications* — were not described 3. *program duration* — approximately forty weeks— • twelve weeks of basic education • three weeks of prevocational training • twenty-five weeks of vocational training 4. *support services* — placement through Missouri State Employment Service 5. *program context* — not described 6. *environmental context* — primarily rural	1. *locus* — not described

APPENDIX F-1 (continued)

Study	Content	Methodology	Organization	Facilities
Hornbostel et al. (1967)	1. describes *neither general nor specific* objectives for the three training courses (academic, academic/vocational, and vocational) 2. includes *no topical outlines* of training course content 3. utilized a battery of norm-referenced instruments (pre-test, post-test, or both) including the General Aptitude Test Battery (GATB) and the Sequential Tests of Educational Progress (STEP) to evaluate academic achievement levels of trainees	1. a tripartite *non-integrated* treatment that consisted of vocational, vocational/academic, and academic instruction predicated on complementary functions of these educational components 2. *instructional modes or methods* — separate academic curriculum (communications skills, mathematics, social studies, and science) and vocational curriculum (eight occupational areas) offered on an individualized (as needed) nongraded basis 3. *learning process* — group lectures, demonstrations, and peer tutoring indicate a traditional approach with individualized attention as needed 4. *interaction of learner characteristics with techniques of program delivery* — each class accommodated varying rates of learner progress or task mastery and relied on peer tutoring to facilitate < or > proficiency 5. *materials* — commercially available textbooks supplemented by demonstrations and hands-on experience with equipment when appropriate	1. *primary actors* — 338 unemployed or underemployed dropouts between the ages of 17 and 22 who had been out of school at least one year 2. *program context* — program operated in a large urban high school 3. *program duration* — total length va ied from 20 to 48 weeks • academic group — 3 hours per day • academic vocational group — 8 hours per day • vocational group — 5 hours per day 4. *staff qualifications* — not described 5. *support services* — consisted primarily of extracurricular activities — • a student speaker's bureau • enrichment classes offered by regular staff • assemblies with speakers from government and business and industry In addition, both in-school and out-of-school counseling were provided by program staff and state employment security commission respectively 6. *environmental context* — urban (Oklahoma City, OK)	1. *locus* — program operated within a large urban high school; physical plant was not described

APPENDIX F-2

Strategies for Potential Dropouts

Study	Content	Methodology	Organization	Facilities
Buckner (1976)	1. lists *broad objectives* – prevention, control, and elimination of delinquent behavior correlated with a comprehensive dropout prevention and crime reduction program. Also includes *specific objectives* that reflect interventions to improve basic skills achievement levels as reflected by standardized tests, school achievement records, and school grades; to increase employability; and to improve attitude and behavior. 2. mentions *cognitive and attitudinal testing* but does not specify instruments used	1. a *remedial* program designed to improve basic skills achievement, increase employability, and effect attitudinal and behavioral change 2. *instructional modes or methods* – not specified 3. *interaction of learner characteristics with techniques of program delivery* – the program was predicated on the following generalization: that education contributes to a reduction in juvenile crime and in recidivism among program participants who are returnees from correctional institutions. Two approaches to program delivery: the community organization approach and the work role approach provide comprehensive support and reinforcement both in the cognitive and affective realms. The combination of support services and work experience with tangible rewards encourages students to develop full potential. 4. *learning process* – potential dropouts and delinquents attend the program on a part-time basis for remedial academic work supplemented by appropriate support services 5. *materials* – no descriptive information was provided	1. *staff* – consisted of teachers of English and mathematics, counselors, community youth workers, school and community representatives, and correctional counselors 2. *staff qualifications* – described as those with "a cool head, a warm heart, and a firm hand" who could foster a positive attitude in clients toward school and the benefits of education 3. *program duration* – not indicated 4. *support services* – professionals from community agencies who assist with diagnostic procedures, social service requirements, inservice training, and instruction in effective teaching methods for staff 5. *primary actors* – a total of 300 students per year who have been identified as potential dropouts or delinquents or both 6. *program context* – operated in five separate dropout prevention centers in a large metropolitan area 7. *environmental context* – urban (Chicago, IL) including ghetto or poverty pocket areas	1. *locus* – the program was separately housed in five "dropout prevention centers" in metropolitan Chicago

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Karnes et al. (1966)	1. includes no *specific objectives* or *topical outlines* 2. utilizes *norm-referenced* instruments (Stanford Achievement Tests) to measure changes in basic skills achievement levels over time	1. an *integrated* program for potential dropouts classified as slow learners with instruction in basic communication skills (reading, speaking, writing, and spelling) and in practical math integrated with "vocationally necessary" skills or requirements 2. *instructional modes or methods* — curriculum was tailored to meet specific needs. Students in basic communication and computation courses received individual and small-group remedial instruction on an "as needed basis," as determined by severe educational retardation or specific learning disability 3. *interaction of learner characteristics with techniques of program delivery* — the highly structured classroom environment, constant routinization, and an approximate pupil-teacher ratio of 20:1 provided students with individualized instruction, attention, or both when needed and produced generally favorable results both in academic and vocational classes 4. *learning process* — a highly structured classroom environment with individualized instruction and attention provided as needed. 5. *materials* — although specific materials were not mentioned, staff selected, adapted, and prepared instructional materials geared to student needs because of a paucity of commercially available products. Various audiovisual aids were used to supplement materials.	1. *staff* — consisted of teachers, social workers, and psychologists 2. *staff qualifications* — teachers were chosen both for professional training in various vocational areas and in special education and for personal characteristics such as stability, flexibility, and creativity 3. *program duration* — students were enrolled for a minimum of two years 4. *primary actors* — 286 students between the ages of thirteen and twenty-one, of low SES, and with IQs between 75 and 90 5. *support services* — were provided primarily by social workers and entailed assistance in ameliorating students' social and emotional maladjustive behavior. All had masters' degrees in social work and had prior experience with "troubled youths".	1. *locus* — program was separately housed in facilities renovated specifically for this program

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Dickerson (1973)	1. lists *specific goals and objectives* to counsel students as needed in self-appraisal with regard to occupational preferences; to provide a sheltered work experience and vocational curriculum incorporating, combining, and relating basic or compensatory education with the acquisition of vocational skills according to student ability and interest 2. utilized *norm-referenced testing* measures such as the California Basic Skills Test, the Gates-McGinities Reading Test, and the General Aptitude Test Battery (BATB) used both as pre- and as post-tests 3. includes no *topical outlines*	1. an *integrated* program in which vocational instruction in five occupational areas was combined with a compensatory program in basic communication skills, reading, and mathematics as needed for jobs. A remedial reading unit also was available. 2. *instructional modes or methods* – teachers prepared materials to be used with the individualized instructional approach. Basic skills (communication, reading, and mathematics) reflected the information necessary to perform successfully in the chosen occupational area, insofar as it was possible. 3. *learning process* – materials and curriculum were individualized to accommodate each student's unique needs and to include functional learning experiences applicable to daily living 4. *interaction of learner characteristics with techniques of program delivery* – basic skills education based on concrete problems coupled with its relevance and relationship to vocational instruction and sheltered or part-time work experience was generally favorable to program participants 5. *materials* – teachers created, adapted, or modified both vocational and general education curriculum materials. Their efforts resulted in 38 teaching units with a low reading age level utilizing individualized instruction coupled with vocational orientation, information, and work experience activities.	1. *primary actors* – 171 students participated in the program during its three-year span. They were predominantly black and male. 2. *staff* – consisted of a project director (a member of the school's administrative staff), four teacher-coordinators, one reading specialist, and ten sheltered work station supervisors together with consultants and third-party evaluators 3. *staff qualifications* – project director is an administrator as well as on the school board. Four teachers all have bachelor degrees and a genuine concern and understanding of special youth. Ten sheltered work station supervisors were department heads within their specific areas. All staff attended a two-day inservice session that addressed curriculum, materials, and professional training to enhance awareness, understanding, and affective skills needed when dealing with special youth. 4. *program duration* – data collected for the period from July 1, 1970 to June 30, 1973 5. *support services* – extensive individual, group, and behavioral counseling was provided to students. Interest and aptitude testing were completed as well as career exploratory activities. Part-time job placement services were provided. Students also obtained instruction from a reading specialist.	1. *locus* – facility for this project was divided between a junior high school and a high school • junior high school was over-crowded; therefore, two portable classroom units were provided • high school was equally as crowded. One classroom was divided into two rooms by a partition

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Johnson (1973)	1. lists *broad objectives* – to serve potential dropouts in the tenth grade who had basic skills deficiencies, poor attitudes toward school, or individual adjustment problems. Also includes *specific objectives* – to improve academic basic skills; to promote more positive self-concepts; to foster more positive attitudes toward school and the dropout prevention program; to foster awareness and acceptance of responsibility for behavior; to develop greater ability to relate well to others; to increase awareness of job characteristics; to clarify educational and vocational goals 2. utilizes *norm-referenced* instruments (Sequential Tests of Educational Progress) to measure changes in some academic basic skills over time (reading, English expression, and social studies). Locally developed mathematics achievement tests also were administered to students at the beginning and end of the school year. *Attitudinal* measurement was accomplished through teacher ratings of students in six behavioral categories–classroom involvement, assumption of work responsibility, critical questioning, classroom leadership, consideration of others, and feelings about self.	1. an *integrated program* for tenth-grade students considered to be potential dropouts with individualized instruction in the basic skills coupled with an emphasis on vocational awareness and orientation 2. *instructional modes or methods* were highly individualized for every class (English, mathematics, and social studies) and were purposely vocationally relevant 3. *interaction of learner characteristics with techniques of program delivery* were generally favorable to students enrolled in the program. Individualized instruction and attention resulted in modest gains on STEP reading and English expression tests and greater gains on social studies test. Students themselves indicated that reading improvement equalled 85%, writing 65%, math 74%, and social studies 63%. The majority felt that, in addition to academic improvement, they increased their understanding of themselves as well as of careers and jobs. 4. *materials* – not described other than the fact that all were job- or career-related. Work experience and counseling departments provided occupational materials. Field trips, work-related films, and job shadowing augmented the curriculum.	1. *staff* – consisted of a reading teacher and four certified teachers –one each in English, mathematics, reading, and social studies. In addition, a tutor, a work experience coordinator, a counselor, a social worker, and four teacher aides assisted basic skills instructors. 2. *staff qualifications* – not described, except that academic instructors were certified 3. *program duration* – basic schedule was three consecutive one-hour classes in English, mathematics, and social studies in the morning and a special one-hour reading class for students with severe reading problems. Actual program duration was a nine-month academic year. 4. *support services* – were provided by a school counselor and a school social worker 5. *primary actors* – about 100 potential dropouts from the tenth grade	1. *locus* – the program was housed within an urban high school in Minneapolis, MN

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Center for Field Research and School Services (1973)	1. lists the following *specific objectives*— • 80% of participating students who complete the program will make measurable progress toward their high school diploma • 80% of participating students who complete the program will show significant improvement of absenteeism and tardiness • 80% of participating students who complete the program will show a statistically significant improvement in academic achievement as measured by a standard teacher-made examination for each major subject • the program will enable at least 80% of participating students to obtain at least average ratings of work performance from work component supervisors 2. also lists *specific evaluation objectives* to measure level of accomplishment of the corresponding program objectives cited above 3. lists *norm-referenced* instruments used both as pre- and post-tests to determine student progress in basic skills/academic areas: • California Reading Test • California Achievement Test—mathematics In addition, students were pre- and post-tested in science and social studies by teacher-made and city-wide examinations respectively.	1. a *nonintegrated program* with a remedial instruction component to supplement academic and occupational skills training, job orientation and guidance, and paid work experiences 2. *instructional modes or methods* — were not described 3. *interaction of learner characteristics with techniques of program delivery* was generally favorable to student progress toward meeting the stated program objectives 4. *learning process* — was a work-study program combining selected academic classes and paid work experience in alternate weeks for a full year 5. *materials* — commercially available curricula supplemented by teacher-made materials as needed	1. *staff* — consisted of three counselors, an unspecified number of teachers, and administrative personnel 2. *staff qualifications* — were not described except for a comment made by evaluators on the relative lack of experience of counseling staff 3. *program duration* — a full year (summer and academic year) 4. *support services* — not described 5. *primary actors* — 240 potential dropouts from fourteen urban high schools, predominantly minority members 6. *program context* — operated separately from regular high schools	1. *locus* — the program was separately housed in a facility in metropolitan New York City

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Thompson, D. E. (1971)	1. lists both *broad* and *specific* objectives – the broad objective of this program was to assist junior and senior high school students with high dropout potential to overcome academic deficiencies and to provide these students with occupational orientation and skill development training experiences. Specific objectives were – • to intensify the holding power of school through dynamic motivation and expert guidance • to develop and strengthen basic communication and mathematics skills • to provide learning experiences to combat the influence of competing, "pull away from school" attractions • to cultivate more positive attitudes of students toward their limitations • to help students improve self-image and to elevate their aspirations • to prepare school dropouts not subject to compulsory attendance to become constructive members of society • to ensure that students have marketable skills when they leave school 2. no specific *instruments* were described. Eligibility was based on chronological age, intelligence quotient of 70-90, academic retardation of two or more years in language and mathematics, cumulative record of academic, emotional, and social maladjustment, and a record of irregular attendance in elementary school. 3. includes *detailed topical outlines* of selected basic skills courses at various grade levels	1. an *integrated* program predicated on the remediation of basic skills deficiencies in oral and written communication and in mathematics 2. *instructional modes or methods* – within the framework of the traditional classroom, basic skills course content was purposely related to work on occupational concepts that could be readily applied by students. Skill development training was provided through actual employment for fifteen hours weekly during the latter portion of the program. 3. *interaction of learner characteristics with techniques of program delivery* was generally favorable to successful learning experiences for students. Class size was limited. Curriculum and materials were revised or otherwise altered to reflect simplicity and a pragmatic approach. Improved self-image and a more positive attitude resulted from direct attention to deficiencies in these areas. 4. *learning process* – potential dropouts follow a full academic and vocational program with a work experience component designed to enable them to relate academic courses to the world of work. 5. *materials* – not described	1. *staff* – not described 2. *staff qualifications* – not specified except for a statement that project teachers were selected on the basis of their ability, understanding, and desire to help students of low academic achievement 3. *program duration* – a four-year program consisting of nine-month academic periods 4. *support services* – included a carefully planned guidance program, and prevocational, vocational, work-study, and training station experiences 5. *primary actors* – approximately 1200 students identified as potential dropouts were served	1. *locus* – program was housed within the area high schools offering these services in a major southwestern metropolitan area (Houston, Texas)

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Hakanen, L. J. (1978)	1. *broad objectives* – wanted students to attend school voluntarily, to achieve some academic success while there, and to improve their negative self-images 2. studying basic subjects–English, computational skills, science, and social studies–during an abbreviated three-hour school day; also study problems of getting and holding a job; a complete curriculum is currently being developed	1. *instructional modes and methods* – not specified 2. *learning process* – self-contained classroom situation that allows the teacher to develop a very thorough knowledge of the problems of each student; pace of class is individualized to fit their needs; self-discipline is emphasized as an important success factor 3. *environment* – full of positive thoughts and reinforcing messages 4. *interaction of learner characteristics with techniques of program delivery* – individualized and continued positive reinforcement led to positive self-images 5. *success factors* – quality teachers, school board, and administration not afraid of change; and support staff	1. *staff* – teachers (no academic specialty listed), counselors, school psychologist, and assistant principal 2. *staff qualifications* – described as not the average teacher; duties included multidiscipline teaching, counseling, report writing, staffing, and coordinating 3. *program duration* – not originally designed as a terminal program; initially on semester-to-semester basis for 9th and 10th grades but now covers 11th and 12th also; the maximum length was originally set at one year; students in school for ½ day 4. *support services* – none listed 5. *primary actors* – between 15 and 20 students per semester who had been identified as potential dropouts	1. *demography* – Harlem School District, Rockford, Illinois; 150,000 people 2. *locus* – program is housed in regular high school building
Gorman, C. V. (1978)	1. *major objective* – to enable students to return to the regular school program or enter the Occupational Work Experience program 2. three hours of lab experience devoted to two chores: (1) manufacture of cap frame; (2) assembling frame and completing cap; students spent 1½ hours per day in related instruction consisting of general and related subject matter. General subject matter includes: orientation to world of work, employer-employee relations, human relations, hygiene, free enterprise system, and job application. Related subject mat- *(continued)*	1. a *remedial* program designed to help voc-ed students particularly disadvantaged to acquire manipulative skills and social adjustments before they were placed in the Occupational Work Experience program 2. *instructional modes or methods* – based on open entry/open exit concept; unspecified otherwise 3. *interaction of trainee characteristics with techniques of program delivery* – extensive motivation achieved through incentive evaluation system; students evaluated daily on 20-point *(continued)*	1. *staff* – career education staff, supervisor of T&I, voc-ed teachers, vocational guidance counselors, and English and history teachers 2. *staff qualifications* – not identified 3. *program duration* – open entry/open exit 4. *support services* – local dealer of truck caps who handles financial arrangements; no other information provided on support services 5. *primary actors* – disadvantaged youth who have lost interest or are underachieving; enrollment limited to 20 students/teacher	1. *demography* – located in northeastern Ohio in heavily industrialized community of 65,000; major industries–steelmaking and auto assembly plants 2. *locus* – in-school sheltered workshop 3. *equipment and expandables*

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Gorman, C. V. *(continued)*	ter includes: blueprint reading, shop math and assembly line techniques. Academically students are required to take English and history classes. 3. *cognitive and attitudinal criteria* – students are: (1) performing in IQ range of 79-90; (2) ability to learn but low achiever; (3) at least one year behind academically; or (4) unable to adjust to co-op work experience. No specific tests mentioned.	system broken down as: quality–5 pts., quantity–4 pts., safety–4 pts., attitude–4 pts., and clean-up–3 pts.; at end of nine weeks students receive monetary rewards in direct proportion to the number of points they have accumulated; *philosophy* – disadvantaged youth, given purposeful educational experiences, can develop employable skills, technical knowledge, desirable work habits, and attitudes that will enable them to take their places in the community as productive workers 4. *learning process* – hands-on experience for students in voc-ed for three hours a day 5. *materials* – not described		
Casella, D. A. and Schrader, D. R. (1975)	1. *scope* – not an academic urban studies course; it was true counseling with elements of interpersonal struggle, modeling, trust-building, reality-testing, and catharsis 2. *dependent variables* – (1) self-concept measured by Tennessee Self-Concept Scale; (2) interpersonal orientation assessed by FIRO-B Scale; and (3) behavior reported by school records of attendances, credits earned, and productivity 3. *findings* – experimental group showed more improvement in the three areas of self-concept, credit earning, and productivity although not statistically significant	1. a *remedial* program to decrease the alienation felt and exhibited by most continuation students; activity counseling was used to meet this goal 2. *instructional modes or methods* – not really instructional in nature; activity counseling (a) removes the counselor from the adult authority role, (b) develops natural relationships, (c) increases counselor comfort and student relaxation, (d) becomes a medium for spontaneity, and (e) gives rise to natural limits 3. *learning process* – group of twelve students, one teacher-counselor, and one adult volunteer had urban encounter lasting four hours, which *(continued)*	1. *staff* – teachers-counselors and adult volunteers 2. *staff qualifications* – not identified 3. *program duration* – ten weeks 4. *support services* – meeting on-the-scene with some person involved in urban life; the entire metropolitan area functioned as a supporting service 5. *primary actors* – 50 dropout high school students from Beverly Hills Continuation High School	1. *locus* – Beverly Hills Continuation High School – a small learning center located in an industrial park

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Casella, D. A. and Schrader, D. R. *(continued)*		consisted of meeting with some person involved with urban life on-the-scene and a subsequent exchange of opinions, judgments, and feelings. The group then split into triads and explored the surrounding area interviewing and talking with people. 4. *interaction of learner characteristics with techniques of program delivery* – urban activity counseling offers abundant connections or contact points with community, school, and self and therefore is tailor-made for borderline dropout high school students 5. *materials* – no descriptive information		
Thornburg, H. D. (1974)	1. *broad objectives* – (1) a measure of the effectiveness of special academic programs designed especially for the potential dropout determined in terms of holding the students in school; (2) based on the assumption that attitude toward school is an important variable affecting a student's decision to stay in school, the effectiveness of special academic programs in producing positive attitude shift was measured 2. *specific hypotheses* – (1) no difference in IQ between students placed in special academic program and voc-ed program as measured by Otis Quick-Scoring Mental Ability Test; (2) no difference in entering attitudes between special academic voc-ed measured by Pupil Opinion Questionnaire, *(continued)*	1. a *remedial* special academic class covering English and mathematics not designed to increase academic skills as much as to help students feel self-worth and gradually develop a positive attitude toward school 2. *instructional modes or methods* – team teaching and positive reinforcement techniques were the primary learning-instruction component although teaching style was left up to the two instructors.	1. *staff* – two instructors of English and mathematics 2. *staff qualifications* – no selection criteria provided 3. *program duration* – one academic year 4. *support services* – not outlined 5. *primary actors* – 154 high school freshmen from lower SES families passed on family income. Group was divided: 41.7% Mexican American; 27.8% black; 22.2% Anglo; 48.3% Indian. 36 placed in special academic programs and 118 in regular voc-ed program; an additional 94 students selected as control group. *(continued)*	1. *locus* – rural Arizona high school

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Thornburg, H. D. *(continued)*	Form A; (3) post-test using Pupil Opinion Questionnaire, Form B will show increase in positive attitude toward those in special academic programs compared to those in voc-ed; (4) no difference in change scores between those in academic and those in regular classes; (5) greater proportion of dropouts among potentials in voc-ed course in contrast to regular academic program; (6) greater proportion of dropouts among potentials in special academic programs in contrast to regular academic program. 3. *results* – hypotheses 1 and 2 were accepted; data for hypotheses 3 and 4 were not statistically significant; hypothesis 5 was accepted, and hypothesis 6 was rejected. 4. *conclusions* – (1) a special academic program in which positive reinforcement techniques are used is an effective way of maintaining attitudes toward school as well as holding potential dropouts in school; (2) no clear evidence that placement in voc-ed program is sufficient to hold youth in school; (3) since effects found were result of special academic programs, thought should be given to placing students in program for greater portion of day.		6. *criteria for selection* – (a) low in academic potential measured by Academic Promise Test; (b) below average in IQ measured by Otis Quick-Scoring Test; (c) 8th grade appraisal by teacher; (d) attendance records; (e) academic grades; and (f) if they were averaged.	

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Perkins, L. H. (1980)	1. *broad objectives* – to reach a point where success in voc-ed program is possible 2. *orientation* – adult with procedures to: • analyze individual student strengths and weaknesses in 3 Rs • prescribe instruction to correct weaknesses • manage itself • modify itself as needed 3. used a *norm-referenced* Test of Adult Basic Education (TABE) to establish starting point for students	1. IMTS (Individualized Manpower Training System) was established as a support program for students to correct basic education skills 2. *instructional modes or methods* – IMTS is a self-paced, modularized system with pre- and post-tests 3. *interaction of learner characteristics with techniques of program delivery* – the inherent characteristics of motivating students, open-entry and open-exit study, little or no duplication of past educational achievements; staff work closely with students initially to ensure successful completion of the first programmed module and post-module test 4. *materials* – 20 study carrels, a conference room, a testing room, and a staff office	1. *staff* – one professional and two paraprofessionals per 30 students 2. *staff qualifications* – professionals must be able to analyze, prescribe, manage, evaluate, coordinate with other programs in its school, and administer IMTS 3. *program duration* – studies in IMTS are completed when student satisfies objectives stated at beginning as determined by a Test of Adult Basic Education (TABE); they have found that daily two-hour sessions in IMTS are most successful. 4. *support services* – a local university provides workshops in orientation, establishing and staff training; they also analyze data on results 5. *primary actors* – students entering voc-ed program and who have deficiencies identified by teachers or counselors in the three Rs 6. *program context* – operated in 101 different schools in Florida	1. *locus* – housed within area voc-tech centers, community and junior colleges, high schools, junior high schools, skill centers, adult programs, correctional institutions, and on Indian reservations

APPENDIX F-2 (continued)

Study	Content	Methodology	Organization	Facilities
Raymond, E. (1978)	1. *broad objectives* – counseling and tutorial program designed for secondary school potential dropouts; specific objectives to improve the confidence and self-concept of the potential dropout 2. *testing* – reading improvement is measured by San Diego Assessment and Gate-MacGinitie Reading Test; self-concept is measured by Piers-Harris Self-Concept Scale 3. *specific objectives* – (1) have 25% of students reduce treasury by 25% (2) have 33% of students raise GPA by minimum of .25 (3) 25% of students would develop more positive attitudes	1. a *volunteer* program to improve self-concept and confidence 2. *instructional modes or methods* – not specified; students were mainstreamed 3. *interaction of learner characteristics with techniques of program delivery* – provides humane services to point where student can say "Somebody cares about me." 4. *learning process* – just a room where students can go between classes 5. *materials* – no descriptive information	1. *staffing* – two professionals and one paraprofessional with no specific academic background 2. *staff qualifications* – teachers who can love kids, who can confront them with their failures in a positive manner and who are capable of seeing the potential in every human being 3. *program duration* – not mentioned 4. *support services* – not mentioned 5. *primary actors* – potential high school dropouts 6. *environmental context* – Fargo South High School, Fargo, North Dakota	1. *locus* – housed in the basement of the regular high school