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ABSTRACT

Intended to assist practitioners in vocational education in improving program planning and evaluation, this paper provides an overview of needs assessment, which is a method of acquiring evaluative data required by the Vocational Education Amendments of 1978 (P.L. 94-482). The first two sections discuss various definitions of educational needs currently used and the six types of needs assessment methods commonly applied: self-perceived needs discrepancy analysis, interactive needs assessment, objective discrepancy analysis, subjective needs assessment, objective needs assessment, and subjective discrepancy analysis. The last two of these types are further illustrated in the third section as their use in national, state, and local studies is described. (The national study was conducted in large cities, while the other studies were made in Iowa, Tennessee, Florida, and Minnesota.) Then, the state of the art of needs assessment in vocational education is examined. The last section delineates significant issues and problems, including (1) the definition of the term "need"; (2) performance and treatment needs; (3) levels of intensity of educational needs; (4) the combination of hard and soft data; and (5) continuous needs assessment. The appendix contains a list of suggested readings. (This paper is one of a series of sixteen knowledge transformation papers.) (ELG)

NEEDS ASSESSMENT FOR PROGRAM PLANNING IN VOCATIONAL EDUCATION

written by

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FOREWORD

The vocational education amendments of 1976 (P.L. 94-482) place a considerable burden on the states, local education agencies, and postsecondary institutions to engage in planning and evaluation to enhance accountability. In this regard, one method of acquiring useful evaluative data is needs assessment. In fact, needs assessments are mandated by the legislation, which states in part: "Funds are to be distributed by the state to eligible recipients on the basis of annual applications which describe the vocational education needs of potential students in the area of the community served by the applicant." It is important, in light of this legislative emphasis, for vocational educators to understand the state of the art of needs assessment and the problems and issues associated with it. This paper is an attempt to provide an informative overview of the topic.

"Needs Assessment for Program Planning in Vocational Education" is one of a series of 16 papers produced during the first year of the National Center's knowledge transformation program. The 16 papers are concentrated in the four theme areas emphasized under the National Center contract: special needs subpopulations, sex fairness, planning, and evaluation in vocational education. The review and synthesis of research in each topic area is intended to communicate knowledge and suggest applications. Papers should be of interest to all vocational educators, including administrators, researchers, federal agency personnel, and the National Center staff.

The profession is indebted to Dr. J. Stanley Ahmann for his scholarship in preparing the paper. Recognition is also due Dr. Rupert N. Evans, University of Illinois, Dr. D. W. Drewes, Conserva Inc., and Dr. Stephen Franchak, the National Center for Research in Vocational Education, for their critical review of the manuscript. Dr. Carol P. Rowle, research specialist, supervised the publication of the series. Ms. Jo-Ann Cherry coordinated editing and production.

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INTRODUCTION

The importance of program planning in vocational education has increased noticeably in this decade, and most certainly this trend will continue into the 1980s. The 1976 federal legislation in vocational education (P.L. 94-482) placed considerable emphasis on evaluation, planning, and accountability in a prescriptive manner. According to this legislation, many individuals, groups, and agencies must participate in planning and evaluating vocational education programs. The major products of these cooperative efforts are state five-year plans, annual state program plans, and annual accountability reports. The last two update the five-year plan and summarize how the evaluations are being used to improve programs (Wasdyke, 1978, pp. 60-73).

The provisions of P.L. 94-482 place a heavy burden on the states, the local education agencies, and postsecondary institutions. For example, a national Vocational Education Data Reporting and Accounting System requires states and local administrative units to report on the following characteristics of their vocational education programs:

1. Enrollments in a program
2. Teaching staffs
3. Expenditures
4. Facilities
5. Students in school
6. Completers and leavers
7. Employers

These data must be gathered consistently so that they can be aggregated as needed.

Furthermore, all vocational education programs for developing entry-level job skills must be evaluated annually, whereas all programs receiving federal funds must be evaluated once every five years. These evaluations must include program characteristics such as the following:

1. Planning and operational processes such as quality of instruction, guidance services, facilities, employer participation, teacher-pupil ratios, and teacher qualifications
2. Levels of student achievement
3. Levels of student employment success

Primary criteria for determining program success are the extent to which leavers and completers find employment in occupations related to their preparation, and the extent to which they are considered prepared for employment by their employers (U.S. Department of Health, Education and Welfare, 1977, 53822-53891).

Needs assessment must continue to be a major contributing element in vocational education program planning and evaluation, especially if such assessments are repetitive. They are specifically required by the Vocational Education Amendments of 1976, namely:

> Funds are to be distributed by the state to eligible recipients on the basis of annual applications which describe the vocational education needs of potential students in the area of the community served by the applicant and it must be indicated how, and to what extent, the program proposed in the application will meet such needs. (U. S. Department of Health, Education, and Welfare, 1977)

Needs assessments are organized attempts to identify educational deficiencies of all kinds (underachievement by students; inadequate teacher preparation; and insufficient equipment, teaching materials, and space) so that well-designed plans can be made to ameliorate them. Such assessments frequently are made through surveys of students, teachers, counselors, administrators, parents, employees, and employers, in which opinions are obtained about the relative quality of various components of the educational program. In the case of planning vocational education programs for students, data come from estimates of job market trends as well as surveys of vocational preferences of students of secondary-school age and older.

Vocational educators should understand the state of the art of needs assessment and the issues and problems associated with it. This paper presents a discussion of the field along with a bibliography of various publications and reports published in the 1970s.

The first two sections of the paper discuss various definitions of educational needs currently used and the types of needs assessment methods commonly applied. Two of these types, subjective discrepancy analysis and objective needs assessment, are prominent in vocational education, as illustrated by the national, state, and local studies summarized in the third section of the paper. The national study dealt with vocational education needs in large cities, while the other studies focused on state and local assessments in Iowa, Tennessee, Florida, and Minnesota.

The state of the art of needs assessment in vocational education is also examined. This is a difficult task, since this activity is in a dynamic state and its general quality is uneven. It is not surprising, therefore, that a number of significant issues and problems exist. These are delineated in the last section of the paper.

Much work needs to be done to improve and systematize needs assessment in vocational education. On the other hand, important progress has already been made which forms a base for future improvements. This paper attempts to assist practitioners in vocational education in learning more about the strengths and weaknesses of needs assessment and anticipate many of the

changes in methodology which inevitably will come.

Long-range program planning and associated evaluation in vocational education at the local, state, and national levels must improve. Needs assessment is a basic component of this planning and evaluation; practitioners should capitalize on its potential.

EDUCATIONAL NEEDS AND THEIR ASSESSMENT

Defining Educational Needs

Many frequently used words are difficult to define. Such is the word need. For years educators and behavioral scientists have proposed definitions of this term. Perhaps the most common definition is that an educational need is the discrepancy between actual and desired conditions--in other words, a discrepancy between "what is" and "what ought to be" (Provus, 1971, p. 46; Popham, 1975, p. 65; Kaufman, 1968). This is called the discrepancy definition; it is the typical basis for examining individual needs of students.

A major criticism of the discrepancy definition is that it requires knowing what the ideal state is to determine a need, and further requires that this state is a stable target toward which educators strive. There is confusion about the difference between needs and wants. Our wants are well known to us, but the satisfaction of them may not be proper goals. In contrast, we are not always aware of our needs, but the satisfaction of them may be vital to our welfare. A need ends and a want begins when a satisfactory condition has been reached. Therefore, a need may be the gap between "what is" and "what is satisfactory," rather than "what ought to be" (Scriven and Roth, 1978, pp. 1-4).

Clearly there are many sources of needs which are of concern to people in vocational education. Primary among these are student needs, but there are also societal and institutional needs. The three are interrelated and point to the outcomes of educational programs which are less than satisfactory--in other words, educational objectives which are not being met adequately.

It is difficult to separate the personal needs of individuals from those of society and its institutions. They are reciprocal in nature. For instance, each individual has needs related to vocational preparation. The schools are designed to satisfy these student needs in terms of existing and future vocational opportunities. To meet these goals, schools have their own needs such as obtaining a qualified staff, suitable buildings and equipment, and active community support. Thus the fundamental issue is the satisfaction of the personal needs of individuals. The schools organized by society greatly assist this process if they are properly planned and receive continual support.

Assessing Needs in Education

Determining the nature of needs and their relative intensity has always been a task for educators. Usually this has been done informally. Starting in the early 1970s, however, systematic efforts to assess educational needs increased rapidly. An important number of these were stimulated by the accountability movement, along with federal legislation such as the Elementary and Secondary Education Act of 1965. More recent federal legislation, such as the 1976 Amendments to the Vocational Education Act (P.L. 94-482) and the accompanying rules and regulations, also increased the obligation in this area.

A needs assessment is a systematic procedure for determining the discrepancy between existing and desired levels of attainment with respect to specific educational goals. Both so-called objective (for example, test data and manpower projections) and subjective (opinions of students, teachers, and employers) evidence are used to discover where the greatest discrepancies are so that corrective action can be taken. By studying the results of a needs assessment, decision makers in education are better able to assign priorities and to plan and evaluate educational programs so that personnel, funds, and facilities can be used in the most productive way. This is the primary purpose of a needs assessment.

Successful needs assessment should result in better educational planning and evaluation. Moreover, involving both the school and the community in the goal-setting process makes the educational enterprise more accountable to its many constituents. At the same time, those participating become better informed about educational programs.

Needs assessment is an integral part of program evaluation (Anderson and Ball, 1978, pp. 15-22). It is the first major step because, weak as it might be at times, it helps to establish the focus of programs designed to improve the outcome levels of the educational process. From the needs assessment come the objectives of the program, and from the objectives a plan of work can be developed. In addition, the needs assessment may reveal pre-existing conditions (often called antecedents) which will influence the design of any intervention to improve a learning situation.

An evaluation of an educational intervention will make more sense if it reflects how much the program in question meets the needs previously identified and recognizes existing conditions which might enhance or reduce the likelihood of program success. In a general way, repetitive needs assessments can reveal if the needs identified before the educational intervention have been reduced by the intervention. Hence follow-up surveys of students and employers are valuable evaluative tools (Wentling and Lawson, 1975, pp. 123-192).

TYPES OF NEEDS ASSESSMENT

Many needs assessments have been conducted at the
a variety of formal and informal methods have been
to classify them in an orderly manner. One classi
pp. 36-54) uses the following categories:

1. Objective discrepancy analysis. Student perfo
objective means (for example, by using standar
and compared to desired status on a set of pre
status is estimated by student, educator and/o
Actual status is compared to desired status to
needs (Hoepfner, et al., 1972).

2. Subjective discrepancy analysis. Only subject
estimate for each educational goal the level o
should exist and the level which actually exis
of reference groups (students, teachers, emplo
obtained and summarized for both "what is" and
results are analyzed to locate large discrepan
Hamilton, 1973).

3. Self-perceived needs discrepancy analysis. St
independently the levels of their skills in te
their perceptions of "what is" are compared wi
"what ought to be" (Witkin, 1975; Copa and Mau

4. Interactive needs assessment. The constituent
systematically interact to generate goal state
importance and current status are analyzed to
1974).

5. Objective needs assessment. Needs are inferre
obtained from outside sources such as job mark
Bureau of Labor Statistics or achievement test
assessments (U.S. Department of Labor, Bureau
1975; National Assessment of Educational Progr

6. Subjective needs assessment. A single rating s
used to obtain from respondents their opinion o
of a group of needs or the desirability of cont
practices.

The brief description of these categories reveals t
overlap exists among them. This overlap can be exa
six types in two ways; namely, in terms of their re
ancy analysis and subjective data. With regard to

central feature of the first three categories is the direct comparison of information representing present performance with information representing desired performance. This aspect is less pronounced in the last three categories.

Separating the six categories according to their relative dependence on subjective information is also informative. For instance, subjective discrepancy analysis relies on composite judgment of reference groups to establish both existing and desired levels of educational goals attainment. This procedure identifies perceived needs, not validated needs. Four of the six categories use such composite judgment. The two exceptions are the objective discrepancy analysis and the objective needs assessment, in which needs are inferred from objective data collected from existing sources such as the Bureau of Labor Statistics.

Quite likely the two most interesting--and dissimilar--categories of the six are the subjective discrepancy analysis and the objective needs assessment. Models in the former group have been disseminated widely and are frequently used in general needs assessment conducted by local school districts. The latter is particularly useful as a part of vocational education needs assessment. Both are potentially helpful, but have pronounced limitations.

Subjective Discrepancy Analysis and Its Limitations

A number of needs assessment models have been developed which fall in the subjective discrepancy analysis category. One is the Educational Planning Model, often known as the "Phi Delta Kappa Model" (Rose et al., n.d.). This model is reasonably typical of the systematic procedures used to identify perceived needs.

The Educational Planning Model has three phases, the first being a subjective discrepancy analysis. Its major steps are:

1. Individual members of each reference group (students, teachers, and patrons) independently rate each of eighteen educational goals in terms of their perceived priority and importance for the local school system. Typical goals include "Develop skills to enter a specific field of work," and "Gain information needed to make job selections."

2. In small groups of three to five, members obtain a consensus rating for each of the eighteen goals in terms of their perceived importance.

3. Each individual independently rates each of the eighteen goals in terms of how well current school programs are meeting the goal in question.

4. Comparisons of perceived importance with perceived level of performance yield a priority listing of goals.

Phase II of this model is concerned with translating the perceived needs of the district into program level performance objectives for proposed courses

of instruction designed to meet the unachieved goals of the district. In Phase III corrective interventions to achieve target objectives are designed, implemented, and evaluated, and recycling occurs. In this phase provision is also made for an expanded needs assessment; that is, compilation of objective data such as achievement test scores to verify the perceived needs thought to exist.

The subjective discrepancy analysis has considerable face validity. Reference groups important to all aspects of education, and presumably knowledgeable about local programs, systematically give their judgment about any existing performance deficits. Summaries of their findings about where schools should improve usually generate significant community support. On the other hand, is the process as sound as it seems? A number of questions can be asked:

1. Are representative samples of participants from the various reference groups being used?

2. Are composite judgments of "what is" true reflections of the actual situation?

3. Are composite judgments little more than crude averages of the opinions of disparate reference groups?

4. Are the participants rating the desired performance for an educational goal in terms of "what ought to be"--which is probably an unrealistic dream--or in terms of "what is satisfactory"?

5. Does this kind of analysis vastly oversimplify the needs which truly exist and the views that constituents have of them?

All these questions point to the weaknesses of the subjective discrepancy analysis method, however popular it might be. Furthermore, there are other problems (Scriven and Roth, 1978, pp. 6-8). For example:

1. It is unclear whether the participants are voting for basic (or continuing) needs, or incremental (or change) needs. For instance, it is one matter to ask schools to provide instruction in the basic skills (a goal which commonly receives a high priority) and another to ask that they provide more of such instruction. The incremental needs are important ones in this case, but have the participants made this distinction?

2. The analysis is essentially a "blue-sky" process in which the realities of resource and program limitations are largely ignored. Since discretionary money is rarely sufficient, resources needed to install new programs must be drawn at least in part from existing programs. Hence, producing improvement in basic skills achievement may mean a partial loss of support for other programs. But this "trade-off" is not part of the analysis.

Because of these problems, this needs assessment method and the workshop format often used with it is sometimes understandably called a disaster (Scriven and Roth, 1978, p. 6).

Obviously, subjective discrepancy analysis is highly subjective and, at best, identifies only in a general way the existing educational needs. There is a sizable gap between the information it produces and the design and implementation of a realistic program innovation which might serve to reduce the intensity of the perceived needs. Phases II and III of the Educational Planning Model attempt to bridge this gap, but by no means eliminate the role of the decision maker who must determine what remedial action is most feasible and cost-effective (Popham, 1975, p. 69).

Objective Needs Assessment and Its Limitations

Planners in vocational education rely on job market data to good advantage when planning programs. In spite of certain weaknesses, these data can be a significant part of a needs assessment in vocational education. This is true when a comparison is made between a vocational education curriculum and the occupational needs of a designated region for the purpose of modifying the curriculum to better assist the community (Breuder, 1973). Labor market forecasts, local business and industry employment reports, summaries of jobs requested in various occupations, and demographic data are used for this comparison.

To the degree that data such as job market forecasts are made available regularly, it is possible to discern trends and therefore to infer future vocational education needs. On the other hand, disagreement may exist as to which of several possible inferences is the proper one. It is well to remember that survey data--even when gathered with great care--identify degrees of relationships among variables, but do not prove or disprove causality. It follows that the study of possible relationships between trends (for example, employment data) and background variables (demographic data) may offer insights useful for program planning in vocational education. Such study, however, also may trap the unwary.

Overreliance on data from external sources can be dangerous for other reasons --usually because the data were gathered for other purposes than needs assessment in vocational education. Job market projections, for example, may be based on too large a geographic area--a sizable region, a state, or even the nation. They deal most frequently with labor demands, not labor supply; they are based on all openings, not entry-level openings only; and they predict job openings due to growth but perhaps not replacement, which is the more important of the two factors.

Human resource projections are based on many assumptions concerning the nature and direction of future economic and demographic trends. Since some of these assumptions will not be fully met, the forecasts have deficiencies (Levitan et al., 1972, pp. 77-87). Nevertheless, such data, though flawed, are useful for objective needs assessments.

Models for Planning Vocational Education Programs

Integrating data from external sources with the typical educational data about students and programs has always been a most challenging task when planning vocational education programs. This has been largely accomplished in some of the policy information systems which have been designed (Fishkind et al., 1976; Atteberry et al., 1977; Hamlin et al., 1977). Some attempt five-year projections of various planning needs for vocational education. Since the usefulness of these methods has not been fully exploited by vocational educators, it is worthwhile to examine the following two well-organized systems.

A Systems Model for Planning Vocational Education

One needs assessment system tailored to vocational education requirements is capable of identifying the number of persons at the local, regional, or state level who are in need of vocational education services at the secondary, postsecondary, and adult levels (Atteberry et al., 1977). These estimates are based on data concerning area unemployment, population trends, size of labor force, projected number of job openings, and levels of income.

The Atteberry model was designed to meet several criteria, namely:

1. To identify groups of people to be served by vocational education as required by federal legislation--that is, persons of all ages in all communities of the state, including those in high school; those preparing to enter the labor market; those who need their skills upgraded; those with special educational handicaps; and those in postsecondary schools.

2. To recognize that different levels of the vocational education system have distinct target groups to serve. For example, postsecondary programs are designed to provide specific skill preparation in occupations which require a higher level of educational preparation than programs at the secondary level, whereas adult programs are aimed at upgrading or retraining those persons who have already entered the labor force.

3. To reflect the vocational education needs of those individuals having labor market problems--for example, those who may be unemployed because of inadequate skills to secure or hold a job.

4. To allow for the changing nature of vocational education needs--that is, to recognize that the needs for vocational education services in a community are a function of the types of employment available, the industrial base, and other economic factors.

5. To recognize the relationship of vocational education programs to those of other agencies or institutions involved in the development of human resources (for example, on-the-job training and CETA programs), since it is likely that there is considerable overlap in the target groups of these agencies.

6. To use to the greatest possible degree existing data which have been collected by other agencies such as the Bureau of Census and the state employment offices.

The methods developed for this system permit estimates to be made of the number of high-school-age students and adults in need of vocational education services. Also, postsecondary vocational education needs are estimated in terms of a variety of occupations. The planning model and the decision-making support system using goal programming are innovative. Their successful use requires vocational education administrators to have a working knowledge of operations research, economics, and management.

A Policy Information System

Another approach to planning vocational education programs is to use a policy information system based in large part on assessments of students and community needs (Hamlin et al., 1977). Student interest and labor market demand are assessed, and projections are made of student enrollments in various programs. The costs of alternative target programs to meet the identified needs are determined in terms of institutional staff needs and associated salary requirements, capital outlay, and consumable costs. Decision makers are now in a better position to select the alternative program which best meets student and community needs within available resources.

Eight steps are used in the program-planning process. The first four constitute Part I of the policy information system and yield a set of enrollment projections for individual vocational programs using the factors of total enrollment, student interest, and labor market demand. Each of these factors is determined by a separate projection; the weighting of each is left to the determination of the local vocational education administrator. Typically this is based on past experience, knowledge of the limits of the data involved, and the particular emphasis which the local district wishes to place on student interest or replacement in the labor market.

Part II is also composed of four steps. It uses the set of program projections developed in Part I to estimate the staff, facilities, and other costs associated with each program at the projected enrollment level. Thus, firm estimates are made of resource requirements and costs if one of the proposed programs is adopted.

The policy information system is intended to be a comparatively simple tool to assist vocational education administrators in long-range planning. The planning model is designed so that a planner can use it in segments, discarding parts not appropriate to a local situation. The model is flexible. For instance, alternative methods are described for making the needed projection. One method, based primarily on professional judgment, requires only that the planner make an informal estimate of the factor under consideration. If districts have developed their own projections or estimates of program information, these can enter directly into the procedures of the model. Coordinating information sources makes it easier to integrate the planning

process into the routine activities of a vocational education administrator.

The Hamlin policy information system and the systems model previously described have a number of common features. Both include a wide variety of data and attempt to present the decision maker with reasonably well-defined options. Moreover, they establish a significant data base for use in any formative or summative evaluation of programs which may be conducted as a result of the needs assessment. Needs assessment methods which can accomplish such goals are vital to successful planning and evaluation in vocational education. They greatly assist vocational educators in implementing federal legislation.

ILLUSTRATIVE NEEDS ASSESSMENTS IN VOCATIONAL EDUCATION

A variety of needs assessments have been conducted in vocational education at the national, state, and local levels. Since they differ in scope and quality, it is difficult to identify a representative cross section.

On the other hand, it is quite profitable to examine the methods and findings of selected comprehensive needs assessments. Illustrative of these are the national efforts conducted in the mid-1970s through the Center for Vocational Education at The Ohio State University to identify major program needs in vocational education. These and the state and local assessments described in the following sections incorporate--sometimes with modifications--elements of six types of needs assessments previously described. Particularly prominent are subjective discrepancy analyses, objective needs assessment, and self-perceived needs discrepancy analysis. The intermixing of methods classified in these categories is relatively common.

Vocational Education Needs in Large Cities: A National Study

In the early 1970s several national studies of vocational education needs were completed, including a major effort to determine primary research and development needs (Morrison, 1978). In this study, information was gathered from state directors of vocational education, directors of community and junior colleges, executive secretaries for state advisory councils, directors of state instructional materials laboratories, and research coordinating unit directors. This and other investigations provided the foundation for a comhensive assessment of vocational education needs in large cities (Adams, 1977).

The urban needs study addressed three questions:

1. What are the perceived needs for vocational education programs in large cities?

2. What is the relative priority of these needs as perceived by urban vocational educators?

3. How do the vocational education priorities of cities differ in terms of their size, geographic location, and minority level?

To answer the foregoing questions, a combination of interactive needs assessment and subjective discrepancy analysis methods were used. The steps for measuring needs were:

1. Determining major problems
2. Determining major goals
3. Developing need statements based on discrepancies between problems and goals
4. Determining the relative priority of these needs

In developing need statements an effort was made to obtain maximum involvement of urban vocational educators, students, and citizens. Open-ended surveys and personal interviews were used to explore major problems and goals for urban vocational education. In this manner information was collected and synthesized into statements of need.

The relative priority of vocational education needs was assessed by using a "degree of need" scale. The degree of need was defined as the difference between "what is" and "what should be," in addition to the importance of reducing that difference. In other words, judgments as to the amount of difference and the importance of the difference were combined to form one rating.

The population used in the study was that of cities with over 100,000 residents according to the 1970 census, in addition to the largest city in states that do not have a city of at least that size. A total of 164 cities were included in the study.

To explore the critical needs in the urban vocational education program, three approaches were used. First, personal interviews were conducted with representative groups from the educational and manpower community in fourteen large cities. Second, an open-ended mail survey was sent to district level vocational personnel in 160 large cities. Third, key documents from the literature were analyzed. As a result of these efforts, over 6,000 statements of problems and goals for resolving them were generated for twelve areas of vocational education.

The information gathered was reduced to 30 major goals and 260 specific needs relating to these goals. Four areas of vocational education were represented: curriculum and instruction, administration, personnel, and guidance and counseling.

To obtain a priority listing of the 30 major goals and the 260 specific needs, a packet of five survey instruments was developed and mailed to district-level vocational personnel in 160 large cities. Nearly 70 percent of those receiving the survey instruments provided priority ratings of the goals and needs.

Of the ten highest-ranked major goals, four were in guidance and counseling, three in curriculum and instruction, and three in administration.

A total of 260 specific needs were rated by a variety of individuals at the district level. Among those who responded to the rating scales for these needs were curriculum directors, directors of guidance services, administrative assistants, coordinators of career education, school principals and directors, vocational directors, school-industry coordinators, and selected teachers and counselors. Specific needs in two major goal areas dominated the list of the fifty needs judged to have the greatest importance in urban vocational education programs. These major goal areas were vocational guidance and community relations, each accounting for 18 percent of the specific needs in the top fifty.

Major findings from this national study include:

1. Sixty percent of the ten highest national priority major goals related to improving the linkages between vocational programs and the world of work through such avenues as providing vocational guidance on careers, insuring the relevance of vocational curricula to jobs, expanding work experience opportunities for students, and improving community relations and support.

2. Major goals related to the on-going support and maintenance of vocational programs (for example, expanding facilities, increasing the number and quality of personnel, etc.) tended to be ranked as lower or medium-level national priorities.

3. The highest-ranked national major goal area focused on an adequate and equitable funding base for vocational education programs in urban centers.

4. The vocational education priorities for cities with different minority levels were highly similar.

5. Vocational education priorities were the least similar between cities in the North Central and Western regions of the United States, the North Central and Northeastern regions, and the Northeastern and Southern regions.

6. No significant difference in the intensity of need was found among cities of various size, although the level of need was higher for cities with populations greater than 200,000 than for smaller cities.

A study of this kind was intended to provide information which would assist in making decisions concerning programs and services, and in guiding activities in an urban vocational education center. Ideally, the information generated would be useful at the national level as well as the state and local level. At the national level, for example, accurate information about vocational education needs would provide a basis for determining resource allocation priorities for federal legislation and funds, as well as for identifying areas of concern which require research and development by national and regional centers and laboratories. In the case of state and local levels, the identification of

vocational education needs would assist the process of establishing criteria for evaluating local programs and revising and/or developing program objectives.

State-Level Occupational Training Needs: Iowa

The planning of vocational education programs can be assisted by data gathered at the state level which systematically identify the primary areas of training needs. This is true in Iowa where, starting in 1972-1973, the Career Education Needs Information System (CENIS) was developed and implemented by the Department of Public Instruction, working in close cooperation with the Iowa Department of Job Service, the Iowa Development Commission, and other state agencies and organizations (Iowa Department of Public Instruction, 1978a). CENIS is a four-part data-gathering and reporting system based on (1) labor demand, (2) labor supply as measured by training output, (3) student interests, and (4) student outcomes as determined by follow-up studies. Cycle I was completed in 1973, Cycle II in 1976, and Cycle III in 1978. Although the methodology changed somewhat from time to time, that used in 1978 was basically the same as that used in 1976.

The labor demand survey was based on almost 300 occupations requiring specialized job training of less than a baccalaureate degree. A stratified sample of employers was drawn and interviews were conducted. The interviews provided projected labor demand data which formed a composite statewide report for each occupational area, indicating current and projected employment as well as the number of individuals being prepared to work in that occupation through formal in-plant training. The portions of the projected demand resulting from expansion and replacement were also identified.

Estimates of labor supply were based on four different sources--vocational education programs, private business and industry training programs, CETA programs, and private school programs. These four sources of information were combined to determine the total supply of potential workers available within each course area. In 1978 the statewide total supply for all training areas was 27,443 individuals.

To measure student interest, a questionnaire was administered by secondary school counselors to a seven percent sample of eleventh and twelfth grade students in all Iowa public and private schools. The occupational choice portion of the survey was designed to reflect the students' degree of certainty with regard to entering their first-choice occupations. Final projections were based on only those students who had expressed a high degree of certainty regarding their occupational choices. Approximately 330 occupations were included from which the student could choose. The four top occupational choices were farmer, registered nurse, automobile mechanic, and secretary.

An annual vocational follow-up survey was conducted which attempted to obtain an assessment of the effectiveness of preparatory career education programs one year after the students had left the programs. The data were gathered from former students (who either completed or withdrew from vocational programs)

by participating secondary schools and area schools in the state. Statewide survey results indicated that 74 percent of the 1975-1976 students had completed their training programs, while 59 percent of the vocational program leavers were employed in 1977 in the occupation for which they were trained, or in a closely related occupation. Over 90 percent of the former students were employed within the state.

The most significant output items from each of the four CENIS components were interfaced to provide a manpower/vocational education profile for each of the U.S. Office of Education taxonomy areas. The most important aspect of the interface was the net demand estimate for an occupation. This was determined by combining the four sources of labor supply to form a total supply estimate and finding the difference between this estimate and the labor demand estimate. The result is a net demand estimate which afforded a realistic indication of actual job opportunities and is, therefore, vital in manpower planning.

Comparisons of the three CENIS cycles revealed some fluctuations among occupational service areas, but also showed considerable consistency in labor demand trends. The data from the CENIS survey were used to develop two lists --a primary training needs area list and a priority program area list (Iowa Department of Public Instruction, 1978b). The former was designed to identify occupational areas with varying degrees of occupational demand--in other words, areas where training needs existed within the state. This list considered only labor demand and training output factors. In contrast, the priority program area listing actually attempted to establish a priority for the training needs. It reflected such practical factors as the ratio of expansion to replacement in the manpower needs component, the availability of students interested in and needing such programs, and the effectiveness of previous programs in terms of attrition, placement, and the cost/benefit ratio.

Because of the many factors involved in the determination of the priority program area listing, it is not surprising to find that many occupations shift in position from one survey to another. For example, dental hygienist was number 56 in 1974, number 1 in 1976, and number 54 in 1978. Optometrist's assistant did not appear in 1976, but was number 1 in 1978. In contrast, some occupations maintained a relatively stable position; nine of the same program areas appear in the top twenty-five on both the 1976 and 1978 lists.

These lists reflect the fluctuating needs of employers as well as those of actual and potential vocational education students at that particular moment. Because these needs change so rapidly, updating the list on an annual basis is highly desirable. Needs assessments of this type reveal the dynamic situation faced by vocational educators, and hence the need to respond quickly when planning educational programs.

Ranking General Educational Goals

In 1974 the Iowa legislature enacted a law which required every public school district to determine its major educational needs and to rank them in order of

priority. On the basis of this ranking, each school district was to develop long-range plans to meet the designated needs and, having accomplished this, to implement year-by-year short-range and intermediate-range plans to attain the desired levels of pupil achievement.

More than half of the school districts (both public and private) in the state chose to implement The Educational Planning Model developed under the auspices of Phi Delta Kappa. The first step of this model calls for ranking eighteen general educational goals in terms of their importance to the school. These are composite rankings usually based on the opinions of four groups---students, parents, school faculty, and other residents of the school district.

One study of forty-one rural Iowa school districts which used the goal-setting procedures of the Educational Planning Model showed that a remarkable degree of consistency existed among the rankings of the eighteen goals (Netusil, 1978). For all practical purposes the first two goals in terms of importance to the schools were:

1. Develop skills in reading, writing, speaking, and listening
2. Gain a general education

The consistency with which the reference groups ranked the goals was more striking than the consistency with which these groups ranked the same goals in terms of how well the current school programs were meeting them. The latter activity is a subjective discrepancy analysis and constitutes the second major step of Phase I of the Educational Planning Model. Perceived current and desired levels of performance of the district goals were compared to find those goals where the need for improvement was the greatest.

Quite regularly the reference groups were most concerned about student achievement in relationship to goals such as the development of skills in reading, writing, speaking, and listening, and the development of good character and self respect (McNally and Birnie, 1978). The reference groups associated with rural Iowa schools rarely expressed a great concern as to how well the schools were helping students to achieve two goals of primary importance to vocational educators, namely, "Developing skills to enter a specific field of work" and "Gain information needed to make job selections."

Schools wrote program objectives associated with goals where high need was thought to exist and proceeded to revise instructional strategies and evaluation practices accordingly. Some schools formed teacher-parent-student committees to work jointly on improvements, and others implemented programs and planned their evaluation in accordance with Phase II and Phase III of the Educational Planning Model.

It is interesting to compare the composite perceptions of educational needs yielded by ranking general educational goals in rural schools in Iowa with the occupational training needs of that state as revealed by the Career Education Needs Information System. The expected widespread differences do indeed exist. The subjective discrepancy analysis based on eighteen general goals revealed

little concern about goals of direct importance to vocational educators. There was concern, of course, about the basic skills that are fundamental to job success. On the other hand, Cycle III of the Career Education Needs Information System established a pattern of courses and programs needed for entry-level job skills instruction. Some of these programs should be of concern to the secondary school even though the general needs assessment in the rural schools did not suggest that these schools should increase their vocational education programs.

A Needs Assessment of Employment Demands and Interest: Tennessee

In the early 1970s the Metropolitan Public Schools of Nashville-Davidson County in Tennessee were engaged in a large expansion of their vocational education programs. Concern was expressed regarding the nature of the individual interests and community needs to be served through these expanded programs. Consequently, surveys of student and parent interest and of employment demands in Greater Nashville were conducted. These surveys were designed not to interfere greatly with normal school operations and to permit replication of the survey efforts in later years if desired. A strong effort was made to include individual interests and employment opportunities unique to Greater Nashville (Gray et al., 1975). The findings of the survey were reported in terms of:

1. Nashville area employment needs for 1976
2. Entrance requirements for the highest demand occupations
3. Student and parent survey findings
4. Perceptions of curricular needs by school personnel

Of critical importance to the needs assessment was the planning for expansion of vocational education programs for semiskilled and skilled level employment needs of the area served by the schools. Three surveys were conducted for this purpose: a general employment demands survey, a special survey of agribusiness occupations, and a special survey of music industry occupations.

Clusters of occupations were ranked in terms of employment opportunities in 1976 by means of the three surveys, each position having been estimated by community leaders, agribusiness leaders, and music leaders. According to the estimates made by these respondents, the occupational cluster with the greatest employment opportunities was the clerical cluster, followed by the hospitality industry and construction and metal working. The annual job openings by cluster through 1980 were expected to remain near the 1976 estimates.

Estimates were also made for job openings for 1976 for sixty-four occupational titles and were reported as part of the survey results. The greatest number of job openings estimated by community leaders were for secretaries, retail salespersons, bookkeepers, typists, and institutional home aides.

A highly important part of the needs assessment was the effort to evaluate the occupational interests of students and the occupational expectations that

parents held for their children. To obtain this information; average ranks were found for all job titles within an occupational cluster. Fourteen occupational clusters were developed around the occupation titles included in the questionnaire, each containing between four and twelve job titles.

Since there was a high degree of relationship between the preferences of students and parents, data were reported only on student interests. By a sizable margin the entertainment industry cluster achieved the highest rank followed by clerical occupations, human services professions, publishing industry occuaptions, medical professions, and health services. The least attractive occupational clusters were sales occupations and physical science professionals. Within some clusters there was considerable variability with respect to the appeal of the occupations. High-interest occupations sometimes were mixed with low-interest occupations when obtaining an average ranking for a cluster.

Student and parent preferences regarding occupational features were quite similar. The features preferred by students were high pay, working with people, challenge and excitement, and a chance for advancement. Features preferred for students by their parents were the same plus job security.

Finally, the needs assessment included a survey of school personnel (administrators, counselors, and teachers) with regard to the importance of curricular coverage in the secondary schools for ninety-eight occupations. Of the first ten ranked occupations, seven were related to the construction and repair occupational clusters. In general, the skilled trades were ranked the highest, the applied professions and human services in the middle, and the hospitality industry and entertainment industry in the lowest region. Recommendations resulting from this needs assessment included the fact that the schools should plan and offer vocational curricula on a cluster approach rather than as intensive specialized training programs. It was also recommended that instructional programs be developed which involved two or more vocational services for curricular needs beyond the capabilities of a single service area. Finally, suggestions were made for the development of the curriculum of new vocational education programs not previously offered by the schools.

The needs assessment for the Metropolitan Public Schools of Nashville-Davidson County permitted recommendations to be made with regard to curriculum development, inservice training for personnel, guidance programs, research and evaluation, advisory committees, facilities, and administration. It was recommended that periodic small-scale employment needs assessments be made when a segment of the employment sector is believed to be rapidly changing. In addition, it was recommended that the assessments of student and parent interest should be made at least every five years.

Objective Needs Assessment in Vocational Education: Florida

A needs assessment system based on data generated by outside agencies was developed and used to estimate vocational education needs in northeast Florida

(Fishkind et al., 1976). It included projections of and surpluses of manpower in various occupations, and vocational education programs and organizations and t funding, and facilities. The methodology consisted o

1. Conduct an overall economic analysis of the targe for economic and population growth

2. Make projections of the demand for labor by occup

3. Make a projection of the supply of labor by occup

4. Combine the forecasts of occupational demand and that prospective shortages and surpluses of manpo identified

5. Conduct extensive field surveys of vocational edu ties, students, teachers, and administrators

[redacted]ocational education needs assessment using this me a seven county area in northeast Florida, includin ville. Prospects for economic growth and change were 1980 forecasts of supply and demand for labor for var the analysis of the labor market, implications were d planning future programs in vocational education.

One of the important problems faced in this process wa that the occupational classification system differs si educational classification system. This makes systema market trends to vocational education programs a diffi tables for translating occupational titles into vocati codes published by the Bureau of Labor Statistics were solution of this problem.

An analysis of the 1980 occupational demand and supply the output of the vocational education programs of the occupations with significant excess of demand or signi In this manner vocational education administrators cou programs not consistent with local labor market trends traction of them presumably would take place according

As part of the assessment, a field survey was conducte system for vocational education. Data were gathered r administrative organization, the nature and quality of ment, program funding, students and their needs, and f the basis of the information obtained, it was conclude unevenness existed among the various programs within t was attributed to widely varying costs from county to decentralized administrative organization.

This generalized methodology for needs assessment of vocational education in urban centers is a useful tool. One of its major strengths is that it relies more heavily on objective data than it does on composite judgments of various reference groups. On the other hand, it does not adequately assess the perceived needs of business and industry in the target region. An employer survey could correct this weakness.

Self-Perceived Job Training Needs: Minnesota [5]

In 1976 a procedure was developed and evaluated through which self-perceived job training needs could be assessed and used as one factor in the process of planning, approving, and implementing relevant vocational educational programs (Copa and Maurice, 1976). Using this method, questionnaires were sent to samples of respondents randomly selected in a designated geographic area to obtain an assessment of their job training needs. Three mailings were used, followed by a telephone call as needed. Information was obtained regarding the characteristics of those wanting additional training, type of training interests, the reason why the training was needed, the time when a program could be attended, and any barriers that might prevent attending an educational program if offered.

An assessment of self-perceived job training needs was conducted in a nine-county area in central Minnesota. Members of randomly selected households in these counties were contacted to obtain an assessment of their job training needs. Sixty-three percent responded to the questionnaires. Comparison of the sample to the population of the counties in terms of age, sex, and employment status showed that the sample was fairly representative. Furthermore, studies of the degree of reliability and validity of the questionnaire revealed that it was adequate in terms of the uses made of the data obtained.

One of the major findings of the Minnesota study was that 11 percent of the residents over high school age and 85 percent of the high school seniors believed that they needed additional job training. The older group wanted such training to obtain a different, unrelated job, to prepare for promotion, or to improve productivity in their present job.

There was a high degree of similarity between the types of training needed by residents over high school age and high school seniors. Training was frequently requested in occupations such as office and accounting, health, and public service. For residents over high school age, training was also desired in agriculture.

Typical of assessments based on self-perceived needs discrepancy analysis, the Minnesota study concentrates exclusively on perceived needs by the residents of a designated geographic area and does not provide information about the job market in that area. It is always difficult to reconcile the job training needs expressed by residents with the occupational needs that actually exist in the market place. Nevertheless, the assessment procedure

is useful as a highly efficient way of determining the feelings of those who might be participants in vocational education programs if available. The procedure has been systematized, and a detailed handbook describing the method has been prepared for future assessments. These can be conducted at a comparatively low cost.

NEEDS ASSESSMENT: THE STATE OF THE ART

To describe the state of the art of needs assessment in vocational education requires identifying the central features of the many completed assessments. These features probably represent a summary of the major characteristics of recent activities in this field (Witkin, 1975; Kominski, 1978).

The most prominent features of needs assessment practices are:

1. Identification of goals and their relative priority. Typically, needs assessments formulate educational goals (or rely on an external agency for their development) and then try to establish their relative priority. By itself this practice is not a needs assessment.

2. Deductive and inductive needs assessment. Most needs assessments are deductive, not inductive. In other words, most formulate goals first, then estimate the degree to which they are attained to find discrepancies; this is the deductive method. According to the inductive method, data regarding the current state of affairs are collected first (perhaps from external agencies); goals are then formulated and discrepancies are estimated.

3. Student and institutional needs. Very often both student and institutional needs are determined, with primary emphasis on student needs. In some instances, efforts to cost out possible instructional programs designed to meet prominent student needs are being made as part of the needs assessment.

4. Use of "hard" and "soft" data. Frequently needs assessments use questionnaire surveys of samples of students, teachers, and employers to obtain composite judgments of perceived needs. Such so-called soft data usually stand alone, but may be used in conjunction with hard data such as student achievement test data to validate perceived needs, or economic, employment, and population data. Occasionally a needs assessment in vocational education is based, for all practical purposes, on hard data alone.

5. Statistical analysis of needs assessment data. Data analyses vary widely in terms of degree of sophistication and complexity. Some are limited to the computation of composite ranks and the comparison of such ranks to determine high, average, and low positions in a distribution. In contrast, others are computer-based, thereby facilitating more complex computations such as those required to determine multiple regression equations and discriminant functions.

6. Long-range projections. Serious efforts are being made to develop five-year projections of local employment opportunities and program needs. Since these are made on many assumptions regarding the stability of the economy and population, regular updating of the projections is recommended, perhaps as frequently as every year.

Issues and Problems

Needs assessments have often been too limited and too casual. This may be because many educators feel needs assessments add little to their fund of knowledge, and that thoughtful professional judgment by a decision maker is sufficient for successful long-range planning. Or perhaps the needs of a local region are so dynamic that the findings of a needs assessment are out of date by the time they are known.

Whatever the reason, current needs assessment practices typically have serious weaknesses. Although systematic efforts to assess needs in vocational education in a comprehensive way have been underway for some time, the efficiency, power, and scope required for high quality products have not always been developed. On the other hand, many of the techniques used are standard components of survey research and should be well polished. Examples of these are the construction of high quality data-gathering instruments and the drawing of probability samples of respondents. Perhaps, since needs assessment is not awarded the status of basic research, the same research standards are not applied when designing and using data-gathering methods and statistical analysis.

Prominent issues and problems associated with needs assessment methods are:

1. Definition of the term "need." The definition of the term "need" is still questionable. To consider it the difference between "what is" and "what ought to be" makes a "need" a "want" and leads to confusion. It may be better to consider a "need" the difference between "what is" and "what is satisfactory." Every effort must be made to sharpen the definition of the term "need" in the minds of all reference groups associated with a needs assessment, to reduce the possibility of a major flaw in subjective discrepancy analysis.

2. Performance needs and treatment needs. Needs assessments typically determine performance needs and virtually ignore treatment needs. A performance need is an identified deficit in student achievement in some aspect of the educational program. A treatment need is determined by evaluating possible treatments to find the one which best produces the desired student performance without inappropriate side effects (Scriven and Roth, 1978, p. 5).

A complete needs assessment must identify not only the nature of existing performance needs but also program changes (that is, treatment needs) which suitably satisfy these needs. Furthermore, administrators are greatly

assisted if the needs assessment sorts performance needs into two groups--those for which their education institution has primary responsibility, and those for which other educational institutions or social agencies have primary responsibility.

3. Levels of intensity of educational needs. No matter how they are defined, needs exist. But are they of sufficient intensity to justify remedial action? Obviously, formulating educational goals and establishing their relative priority is not, by itself, a needs assessment. The crucial question is whether the outcome levels of existing programs are adequate and, if not, whether the performance deficits are severe enough to justify important program changes.

   Very often needs assessment methods do not clearly differentiate between basic (or continuing) needs and incremental (or change) needs (Scriven and Roth, 1978, p. 6). The latter is more important to us. Decision makers are concerned about change; they want to know whether to increase or decrease the amount of instruction in various areas of their programs in response to existing conditions.

   Another problem is that general goals frequently overlap and do not stand alone (Netusil, 1978). This also prevents a clear differentiation among needs and their levels of intensity. Improvement results if the needs assessment steps are sequential, starting with a manageable number of general goals and, after finding those where performance needs seem to exist, moving to more specific program objectives incorporated within each general goal selected for further study. Performance deficits can be determined for these, providing a clearer view of the nature of existing needs and an opportunity to probe selectively with regard to their intensity.

4. Combining hard and soft data. For good reason needs assessment in vocational education should include both hard and soft data, the former probably coming from external sources and the latter from questionnaires administered to various reference groups. Combining these data can be clumsy; sometimes it is done in a simplistic manner.

   One problem is the averaging of widely varying opinions of respondents to find a consensus. Much information is lost by this process. A similar oversimplification exists when rankings of job-training needs of various occupations in a cluster are averaged to find the relative rank of that cluster. For instance, two clusters may have approximately the same average rank among all clusters, but the rankings of occupations included in one range from very low to very high when compared to all other occupations, while the rankings for those of the other clusters differ little from each other.

   In summary, synthesizing different kinds of data so that rather clear findings can be presented to decision makers continues to be a troubling matter, even though distinctions such as hard and soft are quite fuzzy. Further attention should be devoted to this problem.

5. **Continuous needs assessment.** Needs assessment should be a continuous process employed during each cycle of a program, in other words, during each cycle of planning, development, implementation, evaluation, and revision (Kominski, 1978, p. 13). Too often it is a one-time-only procedure or, at best, a procedure to be used on an irregular schedule.

   Needs assessments build upon each other. Solving the "start-up" problems of the first streamlines those that follow. Findings from a series of needs assessments reveal any trends that exist, not to mention the dynamic features of manpower needs. For these and other reasons, needs assessment procedures should be incorporated into the standard administrative procedures of a vocational education program.

Is there hope for needs assessment in vocational education? The answer is yes. Stimulated by federal legislation, there is a distinct movement away from "quick and dirty" needs assessments to ones with far wider scope and more substantial quality.

Much must be done to improve the technology used. Skills to design highly valid and reliable data-gathering instruments, to apply probability sampling procedures, and to analyze mountains of data efficiently and properly are available. The problem seems to be a willingness to consider needs assessment as a worthy endeavor to which these skills should be applied.

There is still another problem: the lack of willingness of many vocational educational administrators to engage systematically in long-range program planning and to consider needs assessment findings as an integral part of that planning and associated program evaluation (Atteberry et al., 1977, pp. 149-161). This situation has been attributed to three conditions:

1. A lack of incentive to plan
2. The power of local autonomy in the educational system
3. Inadequate training of administrators in management and planning

The lower the interest in long-range planning, the less likely it is that the role of needs assessment will expand and the state of the art will improve.

At this point, the effort to strengthen program planning and evaluation efforts must not fail. After all, vocational education must deal with manpower problems that transcend school district and political boundaries. It must serve all students better, particularly special groups such as the handicapped. Its delivery system must be as free as possible of duplicative and inefficient programs. Responsiveness to educational needs is required by a sense of professional responsibility as well as the intent of the 1976 amendments to the Vocational Education Act.

Program planning and evaluation in vocational education at the local, regional, state, and national levels must improve. Needs assessment is one of its basic components. The current investment in these endeavors is now paying attractive dividends and must continue to do so in the future.

APPENDIX: SUGGESTED READINGS IN NEEDS ASSESSMENT

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