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ABSTRACT

A sample of 308 educational policymakers (state legislators, state directors of vocational education, local vocational administrators, and directors of state councils of vocational education) was asked to rate the relative importance of 38 quality indicators for secondary vocational education. Usable data were obtained from 207 (67%) of the surveys. Of the 10 indicators ranked most important, 3 measured student achievement and learning, 3 measured labor market outcomes, 2 measured student attendance and retention, and the remaining 2 measured student educational advancement and employer satisfaction. Of the 10 indicators ranked most feasible, 3 were measures of student achievement and learning, 3 were measures of labor market outcomes, 2 were measures of student attendance and retention, and 2 were measures of student educational advancement and employer satisfaction. Seventeen indicators were identified as having both relatively high importance and feasibility ratings. High levels of agreement were found among respondent groups as to the importance of the individual quality indicators. An exploratory factor analysis revealed that the respondents considered the following factors most important: employer satisfaction, economic and social benefits, employment rates, cognitive achievement, and individual and institutional educational effort. Sixteen recommendations regarding future practical and theoretical research were formulated. (Contains 22 references.) (MN)

Summary of Research

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Ratings of Quality Indicators for Secondary Vocational Education Programs by Educational Policy Makers

Donald D. Peasley and N. L. McCaslin

Introduction

An analysis of the recent discourse on American public education shows that issues of quality and accountability received more attention than any other issue. A host of national reform reports—*A Nation at Risk* (National Commission on Excellence in Education, 1983), *Workforce 2000* (Johnston, 1987), *America 2000* (U. S. Department of Education, 1990), *Education Counts* (U. S. Department of Education, 1991)—have carried a theme of holding schools accountable for student achievement, attainment, and retention of requisite knowledge, skills, and attitudes. However, while every significant report on educational reform in the past 10 years has maintained that school systems must be held accountable, considerably less agreement exists on how this accountability should be measured.

Vocational education has been deeply involved in policy debates regarding quality and accountability. Evaluating vocational education program quality is not new (Taylor, in Darcy, 1979). Recent legislation (PL 101-392) explicitly required that states develop and implement a statewide system of core standards and measures for evaluating local secondary programs. Hochlander and Rahn (1992) reported that, in 1991, all 50 states planned to design systems to measure vocational education program performance. McCaslin and Headley (1993) found that by early 1993, nearly all states had implemented at least part of those systems.

These systems, designed to measure program quality, were based upon a variety of indicators. The development of indicators which measure social phenomena is a complex task which requires empirical validation (DeNeufville, 1975). The knowledge base on vocational education in the United States is rich in conceptual supposition regarding indicators of program quality, but poor in terms of empirical evidence that supports the efficacy of these indicators.

Problem Statement

Copa and Salem (1982) conducted a study which identified several potentially valid indicators for use in evaluating vocational education programs, based on importance ratings of Minnesota vocational education supervisors. They recommended that further research investigate the validity, feasibility, and conceptual coherence of vocational education indicators. To date, there have been no studies of a national scope which have attempted to validate the types of indicators used in evaluating vocational education programs. If vocational education decision makers are going to use indicators for program improvement, then a systematic effort must be undertaken to determine which indicators are most relevant and useful. Leaders and scholars in the discipline of vocational education must participate in scholarship which advances this effort.

Purpose of the Research and Research Questions

The purpose of this research was to validate a list of indicator statements for use in evaluating secondary vocational education programs. Also, this study was an exploratory attempt to establish the initial empirical coherence of McCaslin's (1990) framework for evaluating secondary vocational education programs. As part of the investigation, relevant vocational education policy makers (Federal legislators, state legislators, state directors of vocational education, local vocational ad-

ministrators, and executive directors of state councils of vocational education) were asked to rate a series of indicator statements related to secondary vocational education on the criteria of importance and feasibility. The ratings were then used to develop a parsimonious list of indicators which had utility in evaluating and assessing secondary vocational education programs.

The following research questions were developed to guide the study:

1) Which indicators of secondary vocational education quality rate as important to vocational education policy makers? Importance was defined as "a quality, character, or standing such as to entitle to attention or consideration" of an object (Random House, 1979, p. 668). Importance was operationally defined in this study as the numerical ranking (1 being the lowest, 5 the highest) assigned to a quality indicator statement assigned by a vocational education policy maker.
2) How feasible are indicators of secondary vocational education quality, as rated by vocational education policy makers? Feasibility referred to the practicality or "do ability" of a task or object (Random House, 1979, p. 483). Feasibility was operationally defined in this study as the numerical ranking (1 being the lowest, 5 the highest) assigned to a quality indicator statement assigned by a vocational education policy maker.
3) What is the relationship between the feasibility of secondary vocational education quality indicators and their importance, as rated by vocational education policy makers?
4) Are there differences between the different groups of vocational education policy makers in terms of the importance and feasibility ratings of secondary vocational education quality indicators?
5) What are the factors that underlie the importance of secondary vocational education quality indicators, as rated by vocational education policy makers?
6) Are the factors that underlie the importance ratings of secondary vocational education quality indicators congruent with McCaslin's (1990) evaluation framework for vocational education programs?

Theoretical/Conceptual Framework

Research and development of indicators in the field of education increased dramatically during the 1980s (Bryk & Hermanson, 1993). In 1984, the U.S. Department of Education published the first *Wall Chart*, which was a compilation of educational statistics and test scores for each of the 50 states. Debate over the efficacy of these statistics as adequate indicators led to a surge in indicator development (Burstein, Oakes, & Guiton, 1992). The literature on the use of educational indicators has particularly stressed the notion of systems of indicators. Raizen and Jones (1985), in one of the first research based efforts to develop educational indicators, recommended that further research should study specific indicator systems. These systems should, in theory, better describe the components of the educational enterprise in greater depth than individual measures.

While much of the literature about educational indicators supports the development of systems of indicators, vocational education has primarily used individual indicators (White, 1990). Copa and Scholl (1983) stressed the need for the construction of systems of indicators to evaluate vocational education programs. Evaluations of vocational education must rely on systems of evaluative information which reflect the complex interrelationships of inputs, processes, and outcomes (Asche, 1990). A necessary first step in conducting research on educational indicators is to identify a conceptual model of the educational system (Burstein, Oakes, & Guiton, 1992).

Vocational education literature is rich on evaluative models for vocational education. One common theme among all of these models is that they seek to describe educational inputs, processes, and outcomes. Public policy has shifted the emphasis on vocational education evaluation to program outcomes (White, 1990).

McCaslin (1990) proposed a conceptual framework for evaluating vocational education programs (Figure 1). The basic premise of the framework was that those who wish to assess program outcomes must consider a more comprehensive approach. McCaslin posited that there were three major types of evaluative information. Information about educational needs for vocational education included those needs expressed by the "clients" of vocational education—students, employers, and society. The second type of information represented the processes of vocational education. The final component of the framework was the outcomes—economic, educational, and psychosocial—of vocational education. Each component of the framework was thought to be related in a dynamic fashion to the other part of the system. Each component was comprised of several distinct dimensions. Indicators provide measures of these dimensions for each component in the system. The process and outcome components of this framework were used as the basic conceptual foundation of this research.

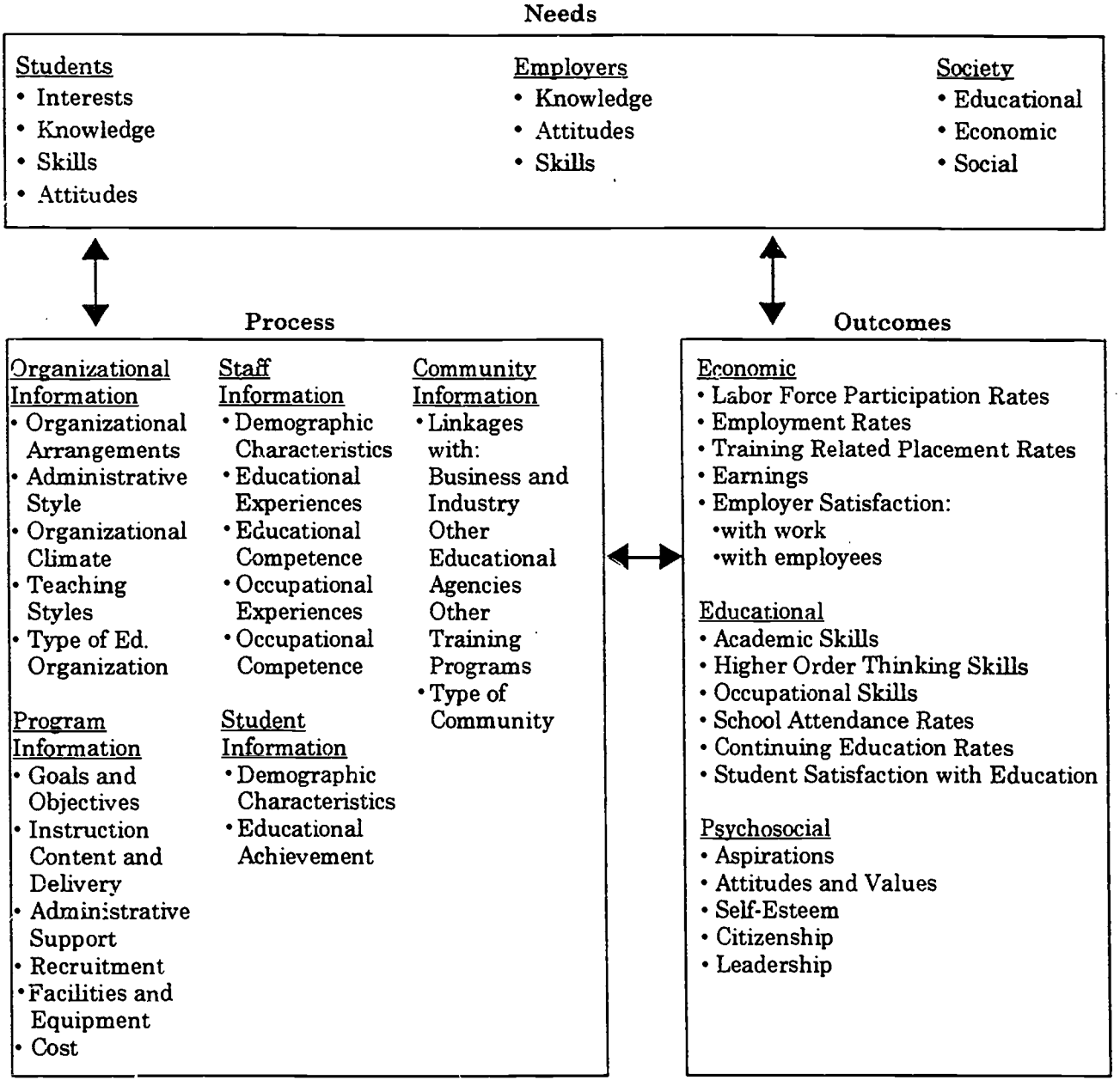

Figure 1. Framework for evaluating vocational education. (McCaslin, 1990, p. 10)

Methodology

There were five distinct populations in this research. The first was state legislators involved in vocational education policy making. The accessible population were those legislators who chaired education committees in their states. A census (N=100) of these legislators was taken for this study. The second population for the study was Federal level legislators most involved with vocational education policy. A census (N=84) was taken of members of the four committees most relevant to vocational education policy: 1) the U.S. House Appropriations Committee-Subcommittee on Labor, Health & Human Services; 2) the U.S. House Committee on Education and Labor (N=41); 3) the U.S. Senate Appropriations Committee-Subcommittee on Labor, Health & Human Services and Education (N=13); and 4) the U.S. Senate Committee on Labor and Human Resources (N=17). The third population for this study was state directors of vocational education. A census (N=55) of these individuals was taken. The fourth population for this research was executive directors of state councils of vocational education. A census (N=53) of these individuals was drawn. The fifth population for this research was local administrators of vocational education. The frame for this study were members of the National Council of Local Administrators (NCLA), a national organization of vocational administrators (N=1,387). A random sample (N=100) was drawn from this frame. A random sample was used for this group because of the large size of the population and because of a desire to construct roughly equivalent groups of policy-makers.

The instrumentation for this research consisted of a written questionnaire containing 38 indicator statements related to vocational education processes and outcomes (see Table 1). These indicator statements were developed from a review of the literature regarding vocational education evaluation. Respondents rated each statement from one (lowest) to five (highest) on two dimensions--importance and feasibility. The scaling technique utilized was a modification of a "double-barreled" pre-needs assessment survey design (Witkin, 1984).

Content validity of the instrument was established through a panel of experts, comprised of vocational education teacher educators, and state-level vocational education administrators. The instrument was also reviewed for format and scaling considerations, face validity, and respondent burden. Instructions and item content were revised accordingly after reviewing the comments of the panel of experts. Item reliability was estimated through an extensive pilot testing procedure.

Vocational teacher educators, state level vocational education officials, and graduate students enrolled in a graduate-level vocational education planning course (n=28) comprised the pilot testing sample. Test-retest percentages of for the items on the instrument ranged from 71% to 100%, and averaged 85%.

Data were collected by mail survey. Cover letters and questionnaires were sent out the second week in June, 1993. After the second mailing, only seven out of 84 (8%) of the Federal legislators had responded. Due to the poor response rate the decision was made at that time to omit Federal legislators from the study. Usable data was obtained from 207 (67%) of the remaining 308 individuals. No attempt was made to make probabilistic inferences beyond these respondents. Data collected were directly applicable only to those 207 individuals who responded to the study. Consequently, conclusions and recommendations made in this study are applicable only to those same individuals. By the same token, the respondents to the survey do represent important members of vocational education policy makers at state and local levels. Logically, their responses to the survey should at the least be of interest to all involved with vocational education.

Summary of Findings

Research Question One

The top 10 most important indicators rated by the overall respondents are listed in Table 2. Three of these indicators were labor market outcomes (labor force participation, occupation related placement, and overall employment rates). Another three statements directly reflected indicators of employer satisfaction (with vocational education program graduates). Two indicators were measures of student achievement, and the final two indicators were measures of student educational advancement. Executive directors of state councils of vocational education and state legislators rated two and three indicators, respectively, among their 10 most important which were not rated among the top 10 most important overall. In general, the data collected for this research question showed that measures of employer satisfaction, student achievement, labor market outcomes, and the educational advancement appear to be important to all policy makers who responded to the survey.

Research Question Two

The 10 most feasible indicators rated by the overall group of respondents are listed in Table 3. Three of these indicators were measures of student

TABLE 1

LIST OF THIRTY-EIGHT INDICATOR STATEMENTS USED IN THE SURVEY

Item	Indicator Statement
1.	Student achievement measured by a gain on a standardized test (pretest-posttest).
2.	Student retention measured by hours of program enrollment.
3.	A description of the counseling services available to the student.
4.	A description of the recruitment activities conducted by the program.
5.	Evidence of teacher performance measured by student opinion survey.
6.	A description of how program evaluation results feed into program planning.
7.	The rate of student advancement to a higher level of skill or competency in the program.
8.	Student achievement measured by gain on a competency (skills) based test (pretest-posttest).
9.	Student learning measured by teacher reports of gains and improvements.
10.	Student retention measured by the percent of students who complete the program.
11.	A comparison of program student characteristics with those of the target student profile.
12.	Student participation in the labor force after completing the program.
13.	Student achievement as measured by assessment of student work portfolios.
14.	Employer satisfaction of program graduates training measured by opinion survey.
15.	The economic return on investment of program graduates as measured by the ratio of graduate earnings to program costs.
16.	Student perceptions of the quality of their vocational preparation.
17.	The rate of student employment in jobs directly related to their training.
18.	Student job success as measured by the average weekly wage of program graduates.
19.	The employment rate of program graduates.
20.	The rate of program graduates who receive government assistance (ADC, general relief, or food stamps).
21.	Student achievement as measured by gain of students' basic skills on a standard proficiency test (pretest-posttest).
22.	The career aspirations of program graduates measured by opinion survey.
23.	Student citizenship as measured by the rate of graduate voter registration
24.	Employer satisfaction of program graduates work habits measured by opinion survey.
25.	Employer satisfaction of program graduates work competency measured by opinion survey.
26.	Evidence of teacher performance measured by supervisor ratings.
27.	Critical thinking ability of program graduates as measured by a standardized critical thinking test.
28.	Problem solving ability of program graduates measured by employer appraisal and teacher observations.
29.	Educational aspirations of program graduates measured by opinion survey.
30.	Student attendance measured by average days per school year missed by students.
31.	The percentage of male and female program graduates employed across all types of occupations.
32.	The earnings of program graduates employed in jobs directly related to their training.
33.	The percentage of program graduates who are self-employed as entrepreneurs.
34.	The percentage of program graduates who are continuing their education in programs related to their training.
35.	Program graduates' knowledge of the world of work as measured by teacher based tests and observation.
36.	Program graduates' self-esteem as measured by a student self-appraisal on an opinion survey.
37.	Program graduates' leadership development as measured by participation rates in vocational student organizations.
38.	Program graduates' work ethic as measured by survey of employers and teacher observation.

TABLE 2

TEN MOST IMPORTANT INDICATORS, AS RATED BY THE OVERALL RESPONDING SAMPLE (N=207)

Indicator Statement	Mean Rating	Std. Deviation
Student participation in the labor force after completing the program.	4.5	.8
Employer satisfaction of program graduates training measured by opinion survey.	4.4	.8
Student achievement measured by gain on a competency (skills) based test (pretest-posttest).	4.4	.9
The employment rate of program graduates.	4.3	.9
Employer satisfaction of program graduates work competency measured by opinion survey.	4.2	.8
The percentage of program graduates who are continuing their education in programs related to their training.	4.1	.9
The rate of student advancement to a higher level of skill or competency in the program.	4.1	1.0
Employer satisfaction of program graduates work habits measured by opinion survey.	4.1	1.0
The rate of student employment in jobs directly related to their training.	4.1	1.0
Student achievement as measured by assessment of student work portfolios.	4.1	.9

Note: Ratings based upon a five point rating scale where 1=lowest and 5=highest.

achievement and learning, three were measures of labor market outcomes, two were measures of student attendance and retention, and the remaining two were measures of student educational advancement and employer satisfaction. Overall, measures of student attendance, retention, achievement, learn-

TABLE 3

TEN MOST FEASIBLE INDICATORS, AS RATED BY THE OVERALL RESPONDING SAMPLE (N=207)

Indicator Statement	Mean Rating	Std. Deviation
Student retention measured by the percent of students who complete the program.	4.4	1.1
Student attendance measured by average days per school year missed by students.	4.1	1.1
The employment rate of program graduates.	4.0	.9
Student participation in the labor force after completing the program.	4.1	1.0
Student achievement measured by gain on a competency (skills) based test (pretest-posttest).4.0 1.0		
The percentage of program graduates who are continuing their education in programs related to their training.	4.0	.9
The rate of student employment in jobs directly related to their training.	4.0	1.0
Employer satisfaction of program graduates training measured by opinion survey.	3.9	1.0
Student achievement measured by a gain on a standardized test (pretest-posttest).	3.9	1.2
Student learning measured by teacher reports of gains and improvements.	3.8	1.0

Note: Ratings based upon a five point rating scale where 1=lowest and 5=highest.

TABLE 4

SPEARMAN RANK ORDER CORRELATIONS OF RESPONDENT GROUPS IMPORTANCE RANKINGS OF INDICATOR STATEMENTS

Respondent Group	1.	2.	3.	4.	5.
1. Overall Group Rank	—				
2. Executive Directors SCOVEs	.96	—			
3. State Legislators	.91	.81	—		
4. State Directors of Voc. Educ.	.97	.92	.84	—	
5. Local Admin.	.96	.90	.89	.89	—

ing, labor market outcomes, and employer satisfaction were rated as being the most feasible indicators for evaluating secondary vocational education programs.

Research Question Three

Seventeen indicators were identified as having both relatively high importance and feasibility ratings, that is, each of these 17 indicators had ratings that were above both the overall mean rating for importance (3.6) and feasibility (3.5).Three measures of labor outcomes, three measures of employer satisfaction, and three measures of student achievement were rated as having the greatest potential for use in evaluating vocational education. Additionally, two measures of student educational advancement and individual measures of student learning, retention, satisfaction, work ethic, and school planning were identified by this analysis.

Research Question Four

There were high levels of agreement between the respondent groups in terms of their importance ranking of vocational education evaluation indicator statements, as evidenced by the Spearman rank order correlations listed in Table 4. Generally, there was a high level of agreement between the respondent groups in terms of their feasibility rankings of the vocational education evaluation indicator statements (Table 5). Another index of the level of agreement between the respondent groups is Kendall coefficient of concordance *W*. This measure describes the overall agreement between each set of respondent group ranks. For both the importance and feasibility rankings, Kendall *W* was substantially positive at .91 and .84, respectively.

Research Question Five

An exploratory factor analysis (using the common factor model; with oblique rotation) was performed in order to determine underlying factors with respondents' importance ratings of the indicator statements. An initial factor analysis was performed in order to determine the optimum number of factors to select for extraction. This determination was based upon an analysis of the scree plot and latent roots (eigen values) of the factors (Hair, Anderson, Tatham, & Black, 1992). This analysis involved analyzing the scree plot for "breaks" among the factors and selecting only those sulted. These experts were asked to analyze individual indicators which "loaded on" (were correlated with) each of the five factors. Indicators which had factor loadings above .40 were listed for each factor (Ford, et al., 1986). The panel was asked to examine the list of indicators for each factor, and suggest a short title which represented the list of indicators. This information was then summarized by the researcher.

TABLE 5

SPEARMAN RANK ORDER CORRELATIONS OF RESPONDENT GROUPS FEASIBILITY RANKINGS OF INDICATOR STATEMENTS

Respondent Group	1.	2.	3.	4.	5.
1. Overall Group Rank	—				
2. Executive Directors SCOVEs	.90	—			
3. State Legislators	.87	.75	—		
4. State Directors of Voc. Educ.	.93	.82	.73	—	
5. Local Admin.	.96	.81	.81	.87	—

The first extracted factor was named ***"employer satisfaction"***, and consisted of five indicator statements. The second extracted factor was named ***"economic and social benefits"***. Six indicators loaded on this factor. The third extracted factor was named ***"employment rates"***. Three indicators loaded on this factor. The fourth extracted factor was named ***"cognitive achievement"***. Three indicators loaded on this factor. The fifth extracted factor was named ***"individual and institutional educational effort"***. Six indicators loaded on this factor. The named factors and their respective indicator lists are shown in Table 6.

Research Question Six

To answer this question, the semantic content of the five named factors was compared with components of the McCaslin (1990) evaluation framework. Table 7 graphically represents this comparison. The right-hand section of the framework classifies the outcomes of vocational education—economic, educational, and psychosocial. In order to determine the congruence of these factors with aspects of the McCaslin framework, a direct semantic comparison of the factor (as named by the panel of experts) was made with specific subparts of the framework. The outcomes components of McCaslin's framework, along with all of the proposed measures of outcomes, are listed in the left-hand column. The factors identified in this study are listed across the top row of Table 7. Individual indicators which comprise each factor are listed in the columns. Shaded areas in Table 7 represent apparent congruence between a factor identified in this research and parts of McCaslin's framework.

The first factor extracted from the importance ratings was named "employer satisfaction." This factor includes five indicators—three direct measures of employer satisfaction with vocational education program graduates and two measures of graduate ability and work ethic. These indicators are aligned in Table 7 with those components of the McCaslin framework which appear to have the most congruence. This factor seemed to match both economic and educational components of outcomes in the McCaslin framework. The three direct measures of employer satisfaction clearly represent an economic outcome which McCaslin posited. The direct measure of student ability is an educational outcome. The indicator of work ethic is also a psychosocial outcome. When an indicator (such as work ethic) appears to have congruence with more than one component of the framework. it is shown twice in Table 7.

The second factor, "economic and social benefits", also had congruence with the outcomes section of the framework. Of the six indicators which comprised the factor, three were measures of economic outcomes and three were measures of the social outcomes of vocational education programs. Two of the economic indicators directly matched the economic part of the framework. Two of the psychosocial indicators directly matched psychosocial parts of the framework. As with the first factor, the congruence with McCaslin's framework was partial, not complete.

The third and fourth factors each had high levels of congruence with the evaluative framework. Factor three. "employment rates", directly matched some of the economic components of vocational education program outcomes. "Cognitive achievement," the fourth factor, directly matched the two of the educational portion of vocational education program outcomes. The fifth factor, "individual and institutional effort" did not match any single component of the framework well. Individual indicators from this factor matched the economic, educational, and psychosocial components of the framework. Indicators which loaded on this factor measure both processes and outcomes of vocational education. "Individual and institutional effort", as defined by the factor analysis, appeared to be less congruent with McCaslin's framework than the other four identified factors. Data collected in this research appeared to have some congruence with McCaslin's framework for evaluating vocational education programs, based upon the importance ratings of the 38 indicator statements used in the survey.

Discussion

These findings echoed some of the recent rhetoric involving American public education. In 1991, the President established a set of National Education Goals. One of these goals stated that

> "American students will leave . . . having demonstrated competency in challenging matter . . . and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy." (U.S. Department of Education, 1991, p.3).

Another of the goals stated:

TABLE 6

ROTATED FACTOR MATRIX LOADINGS ORDER OF IMPORTANCE RATINGS OF INDICATOR STATEMENTS ON OBLIQUE FACTORS (N=207)

Factor 1—*Employer Satisfaction*	Loading
Employer satisfaction of program graduates work competency measured by opinion survey.	.95
Employer satisfaction of program graduates work habits measured by opinion survey.	.92
Employer satisfaction of program graduates training measured by opinion survey.	.54
Problem solving ability of program graduates measured by employer appraisal and teacher observations.	.47
Program graduates' work ethic as measured by survey of employers and teacher observation.	.41
Factor 2—*Economic and Social Benefits*	
Student job success as measured by the average weekly wage of program graduates.	.67
The earnings of program graduates employed in jobs directly related to their training.	.57
The economic return on investment of program graduates as measured by the ratio of graduate earnings to program costs.	.56
Student citizenship as measured by the rate of graduate voter registration.	.47
The rate of program graduates who receive government assistance (ADC, General relief, or food stamps).	.46
Educational aspirations of program graduates measured by opinion survey.	.43
Factor 3—*Employment Rates*	
Student participation in the labor force after completing the program.	-.74
The employment rate of program graduates.	-.71
The rate of student employment in jobs directly related to their training.	-.65
Factor 4—*Cognitive Achievement*	
Student achievement measured by a gain on a standardized test (pretest-posttest).	.80
Student achievement as measured by gain of students' basic skills on a standard proficiency test (pretest-posttest).	.77
Critical thinking ability of program graduates as measured by a standardized critical thinking test.	.44
Factor 5—*Individual and Institutional Educational Effort*	
A description of the counseling services available to the student.	.65
A description of the recruitment activities conducted by the program.	.61
Evidence of teacher performance measured by supervisor ratings.	.46
Student attendance measured by average days per school year missed by students.	.44
Program graduates' work ethic as measured by survey of employers and teacher observation.	.42
Educational aspirations of program graduates measured by opinion survey.	.40

> "Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship."

This research identified measures of employer satisfaction, student achievement, the labor market outcomes of students, and student educational advancement to be among the most important indicators for evaluating vocational education programs. Additionally, measures of student attendance, retention, achievement, learning, labor market outcomes, and employer satisfaction were rated as being the most feasible indicators for evaluating secondary vocational education programs. All of these measures fit within the two National Goals for American Education listed above.

These findings also reflected recommendations which have been made for vocational education. Wirt, et. al. (1989) in the *National Assessment of Vocational Education* recommended that vocational education should:

> "Revise and rebuild the high school [secondary] curriculum to upgrade skill levels and provide students with the mix of occupationally specific and transferable skills they need to get good jobs or to pursue further training and education at the postsecondary level.... [and]... Integrate high school academic and vocational curricula so that students come to vocational programs well equipped with fundamental academic skills. Vocational courses should

TABLE 7

PROPOSED CONGRUENCE OF IDENTIFIED FACTORS WITH OUTCOME COMPONENTS OF MCCASLIN'S FRAMEWORK

McCaslin Framework--Outcome	**Identifed Factors**				
Economic Factors	*Factor 1--Employer Satisfaction*	*Factor 2--Economic and Social Benefits*	*Factor 3--Employment Rates*	*Factor 4--Cognitive Achivement*	*Factor 5--Individual and Institutional Educational Effort*
Labor Force Participation Rates			Labor Force Participation Rates		
Employment and Unemployment Rates			Employment Rates of Graduates		
Training Related Placement			Training Related Placement Rates		
Earnings		Average Weekly Earnings Training Related Earnings			
Employer Satisfaction with Work Employer Satisfaction with Employees	Employer Satisfacation with: Work Habits, Training, Competency, Work Ethic				
Educational Outcomes					
Academic Skills	Problem Solving Ability			Achievement Test Gain Proficiency Test Gain	
Higher Order Thinking Skills	Problem Solving Ability			Critical Thinking Ability	
Knowledge of the World of Work					
Occupational Skills					
School Attendance and Dropout Rates					Student Attendance
Continuing Education Rates					
Satisfacition with Education					
Psycho-Social Outcomes					
Student Aspirations		Educational Aspirations			Educational Aspirations
Student Attitude and Values	Work Ethic				Work Ethic
Student Self Esteem					
Student Citizenship		Voter Registration Rates			
Student Leadership					

Note: Shaded areas of matrix signifies "congruence" of factor statement to framework component.

> also provide an applied context, based on broad and specific job training, that reinforces and enhances academic skills and motivates students to excel in both academic and vocational courses. . . [and] . . . Expand efforts to place students in good jobs that make full use of their vocational and academic training." (pp. iv-xv).

The indicators identified as being both important and feasible were also consistent with public policy regarding vocational education. The Perkins Act specifically outlined the use of performance standards and measures for evaluating vocational education programs. These measures included measures of academic achievement, educational advancement, and labor market outcomes of vocational education students.

These findings supported past research in vocational education evaluations. Taylor, Darcy, and Bolland (1979) compiled a bibliography of evaluative studies of vocational education programs. In particular, studies which measured program graduate employment status, earnings, rates of further education, employer satisfaction, and student learning were among the most frequently used evaluative criteria. Copa and Salem (1982) identified the following indicators as the most important for use in vocational education: employer satisfaction with the quality of graduate work; the number of graduates employed in occupations related to training; projected job openings in occupations related to training; number of graduates employed; occupations for which program is designed to provide training; performance of enrollees in program; and program cost. Respondents who participated in this research identified similar measures as being both important and feasible for use in evaluating vocational education programs.

Burstein, Oakes, and Guiton (1992) maintained that educational effectiveness indicators must be developed which reflect both scientific and political realities. One such political reality is that information collected by educational indicators be relevant to all stakeholders of an educational system. In essence, some consensus among individuals at several levels of decision-making—the legislature, advisory groups, state officials, and local administrators—must be achieved in order for an educational indicator system to be viable. One criticism of vocational educators has been that they have not been proactive in determining some of the standards against which vocational education programs should be judged. This research showed high levels of agreement between the respondent groups in terms of their importance ranking of vocational education evaluation indicator statements. There was also a high level of agreement between the respondent groups in terms of their feasibility rankings of the vocational education evaluation indicator statements. These data showed that among these groups of respondents, there was some level of consensus between different groups of stakeholders of vocational education in terms of what types of indicators are important and feasible for use in evaluating vocational education programs.

Copa and Scholl (1983) stated that indicators for evaluating vocational education must be tied to a clear, conceptual framework of the vocational schooling process. Bryk and Hermanson (1993) wrote of the necessity of a clear, conceptual coherence among the different components of an indicator system. They further maintained that scientific social research must confirm or disconfirm these relationships. To date, little research has been done on a national scale which has tried to empirically examine factors which comprise vocational education quality indicators. DeNeufville (1975) held that at some point in the "lifespan" of an indicator system, the scientific viability of the conceptual framework which that indicator system purports to represent must be examined. Van Dalen (1979) wrote that exploratory research was a necessary first step in the acceptance or disconfirmation of a theory. Hair, et al. (1992) noted that exploratory factor analysis is often necessary when attempting to establish conceptual relationships among a large set of variables. This exploratory study identified five factors accounted for 38.5% of the common variance in the importance ratings of the indicators statements. Four of these factors were deemed "congruent" with the outcomes component of the McCaslin framework. Two of the factors had almost perfect congruence (see Figure 7). When the findings of this study (described above) are contexted with some of the literature regarding educational reform, social and educational indicators, vocational education evaluation, and exploratory research, the following conclusions are drawn:

Conclusion One. Indicators which measure employer satisfaction, student achievement, the labor market outcomes of students, and the educational advancement of students are the most important measures for use in vocational education evaluation.

Conclusion Two. Measures of student attendance, retention, achievement, learning, labor market outcomes, and employer satisfaction are rated as the most feasible indicators for evaluating secondary vocational education programs.

Conclusion Three. Sixteen indicators had both relatively high importance and feasibility ratings, giving these indicators the greatest potential for immediate use in evaluating vocational education programs. These indicators included measures of labor outcomes, employer satisfaction, student educational advancement, student achievement, student learning, retention, satisfaction, work ethic, and a measure of school planning. Of these 16 indicators, 15 were measures of outcomes of vocational education, and one a measure of a vocational education process.

Conclusion Four. There was a high degree of consensus among the respondent groups (executive directors of state councils of education, state legislators, state directors of vocational education, and local administrators of vocational education) in terms of their importance rating of vocational education quality indicators. There was also a degree of consensus in terms of their feasibility ratings of these indicators. Respondents to this survey agreed about what types of quality indicators were both important and feasible for use in evaluating vocational education programs.

Conclusion Five. The importance ratings of vocational education quality indicators contained underlying conceptual factors. These factors were: "employer satisfaction", "economic and social benefits", "employment rates", "cognitive achievement", and "individual and institutional educational effort". These factors represent constructs for evaluating vocational education programs and provide a first step in empirically identifying conceptual relationships for evaluating vocational education programs.

Conclusion Six. Four of the identified factors had congruence with McCaslin's framework for evaluating vocational education programs. Specifically, these factors had congruence with the "outcomes" component of the model. Data collected in this research empirically gave support to McCaslin's evaluation framework. The outcomes of vocational education programs were conceptually comprised of economic, educational, and psychosocial components. Evidence from this study suggests that these components have scientific merit.

Recommendations for Practice

The conclusions of this research provided the basis for several recommendations which are applicable to the practice of vocational education evaluation. These recommendations include:

1. The use of indicators for evaluating vocational education program outcomes should be promoted by those who enact vocational education policy. In particular, state and federal legislatures should encourage the use of measures of labor market outcomes of students, employer satisfaction with vocational education students, student educational advancement, student achievement, student learning, student retention, student satisfaction, and student work ethic.
2. Those who administer and advise vocational education programs, particularly state and local directors, and members of advisory councils should promote using the outcome indicators mentioned above.
3. Since high levels of agreement were apparent in both these data and in the literature, individuals at all levels of vocational education policy should capitalize upon the common ground which exists as to the efficacy of these outcome indicators. When competing for scarce public resources, those concerned with vocational education can take advantage of the fact that there was agreement as to which outcomes are important. This agreement is often lacking in educational reform, and this lack of agreement subsequently hinders reform efforts.
4. Those who administer, fund, and evaluate vocational education program should consider using the constructs of employer satisfaction, employment rates, cognitive achievement, and economic and social benefits when conceptualizing and contextualizing evaluative information regrading vocational education programs.
5. Those who administer, fund, and evaluate vocational education programs should also consider the use of the outcomes component of McCaslin's evaluative framework in interpreting the evaluation results of vocational education programs.

Recommendations for Theory

The conclusions of this research provided the basis for several recommendations which were applicable to the study of the theories of vocational education. These recommendations included:

1. Evaluators of vocational education programs should consider the use of the outcome constructs employer satisfaction, employment rates, cognitive achievement, and economic and social benefits when designing evaluations of vocational education programs. These constructs have a degree of empirical validity. Use of valid constructs when operationalizing measurements in evaluations is critical.

2. Evaluators of vocational education programs should also consider the use of the 16 indicators described in Conclusion Four when designing evaluations of vocational education. These indicators were identified as having perhaps the greatest potential for use.
3. Scholars of vocational education should consider the outcome factors identified in this research as a contribution to the knowledge base regarding vocational education. Since relatively few attempts at empirical theory building exist in vocational education, this research may provide scholars with a philosophical point of departure for scholarly debate and inquiry within the discipline of vocational education.
4. Scholars of vocational education should likewise examine the sixteen indicators identified in conclusion four as another contribution to the knowledge base of vocational education. Debate on the efficacy of these indicators could open important areas of philosophical inquiry with vocational education.
5. Finally, the discipline of vocational education should give serious consideration to McCaslin's evaluation framework for vocational education. These data show that the outcomes portion of the framework have a degree of empirical congruence. These findings should lead scholars and practitioners to further examine the conceptual coherence of this framework.

Recommendations for Research

The conclusions of this research provided the basis for several recommendations which are intended to stimulate further scientific research in vocational education. These recommendations included:

1. Research should replicate this study on other groups of vocational education stakeholders, such as teachers, students, parents, and employers. These groups represent important sources of data which may confirm or disconfirm this study's findings. Federal legislators must be included in follow-up research on this topic. Alternative methods fc gathering data must be considered when Federal legislators are used. When possible, probabilistic sampling procedures should be employed to increase the generalizability of these studies.
2. Research should actually examine the use and implementation of the indicators identified in this study. Case study research may be able to explore in greater the efficacy of the use of systems of indicators in vocational education evaluation.
3. Studies designed to estimate other aspects of the McCaslin framework should be conducted. This research only identified factors related to the outcomes portion of the model. The coherence of the needs and processes portions of the model need to be examined. Also, the proposed interactions between the different parts of the model should be investigated.
4. Feasibility studies which estimate the technical requirements and limitations of indicators identified in this study, as well as some of the resources required to implement the use of these indicators should be conducted.
5. Other research should examine aspects of the level of agreement in terms of indicator importance and feasibility in this research. Group techniques, or Delphi methodologies could refine and extend the areas of consensus between different groups of policy makers which was found in this study.
6. Finally, research should the examine the types of indicators which have efficacy for evaluating postsecondary vocational education programs. This research examined indicators only within the context of secondary education. There are distinct differences between secondary and postsecondary vocational education. Logically, the indicators effective for evaluating postsecondary vocational education may be different than those for secondary vocational education.

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SUMMARY OF RESEARCH SERIES

Recent national reform reports have carried a theme of holding schools accountable for student achievement, attainment, and retention of requisite knowledge, skills, and attitudes. If educational decision-makers are going to use vocational education indicators for program improvement, then a systematic effort must be undertaken to determine which indicators are most relevant and useful. This research validates a list of indicator statements for use in evaluating secondary vocational education programs. It should be of interest to vocational education teachers, local vocational administrators, federal legislators, state legislators, state directors of vocational education, and executive directors of state councils of vocational education.

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Research has been an important function of the Department of Agricultural Education since it was established in 1917. Research conducted by the Department has generally been in the form of graduate theses, staff studies, and funded research. It is the purpose of this series to make useful knowledge from such research available to practitioners in the profession. Individuals desiring additional information on this topic should examine the references cited.

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