

# IMPLICATIONS OF PERFORMANCE MEASURES AND STANDARDS FOR EVALUATION AND ASSESSMENT IN AGRICULTURAL EDUCATION

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## Abstract

*The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 mandated that states develop a system of performance measures and standards to be used for program evaluation and improvement. The purpose of this study was to examine the systems of performance measures and standards that each state had approved in response to the Perkins Act of 1990 for secondary vocational programs and identify implications for agricultural educators. Ninety-six percent of the states reported academic measures and standards for secondary programs. Academic areas of mathematics, reading, and language were ranked high by states as an approved measures for academic skill in both basic and advanced skill area. For other performance, one hundred percent of the states had approved at least one measure for secondary programs. The most common types of measures for other performance were work skill attainment and any placement. Agricultural educators need to be aware of these measures and standards as they plan and modify programs. Agricultural educators should place more emphasis on mathematics, reading, and language. In addition, agricultural educators need to increase their knowledge and skills related to assessment since states indicated a heavy reliance on locally developed assessment techniques.*

The Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 included a requirement that states develop systems of performance measures and standards for use in program evaluation and improvement. Such measures and standards had to be approved and in place by September 1992 (McCaslin & Headley, 1993).

Prior to this legislation, there had been a call for educational programs to be more accountable for the resources they were receiving. Educational systems traditionally have relied upon the review of inputs and processes for accountability. However, the focus on accountability systems in education has been changing to one of assessing outcomes (McCaslin, 1990).

The Center for Law and Education (1990) indicated that a measure is a description of an outcome and a standard is the level or rate of that outcome. Once a state decided the types of academic and other performance to assess (measures), it was then necessary to select the level of acceptable performance (standards). As noted by Hoachlander, Levesque, and Rahn (1992) and the Center for Law and Education (1990), developing standards for performance of vocational education programs was no simple matter. Further, states had to select or develop appropriate assessment instruments and procedures.

Performance measures and standards have the potential for impacting what is taught, how it is taught and how it is evaluated. Agricultural

educators need to be aware of these measures and standards as they plan and modify their programs for the future. Skill measures and standards in areas such as agricultural biotechnology, welding, automotive, and electrical will affect the curriculum, instruction and evaluation of agriculture programs. However, a review of the literature did not find any studies that addressed the use of state systems of performance measures and standards in agricultural education.

The conceptual framework for this study was based on the requirements of the Carl D. Perkins Vocational and Applied Technology Act Amendments of 1990 (here after referred to as Perkins Act of 1990). This legislation mandated that states develop core standards and measures of performance for vocational education programs in the following areas:

- (1) measures of learning and competency gains, including student progress in the achievement of basic and more advanced academic skills; and
- (2) one or more measures of performance, which shall include only (A) competency attainment; (B) job or work skill attainment or enhancement including student progress in achieving occupational skills necessary to obtain employment in the field for which the student has been prepared, including occupational skills in the industry the student is preparing to enter; (C) retention in school or completion of secondary school or its equivalent; and (D) placement into additional training or education, military service, or employment (p.770-771).

### **Purpose and Objectives**

The purpose of this research was to examine the systems of performance measures and standards that each state had approved in response to the Perkins Act of 1990 for secondary vocational programs and

identify implications for agricultural educators. The specific objectives were to:

1. Determine the type of performance measures approved by states.
2. Indicate how states planned to assess student performance.

### **Procedures**

The data for this study was collected by contacting the 54 State, Territory, and District of Columbia Directors of Vocational Education and requesting documents that described their state approved system of performance measures and standards. Documents describing the secondary vocational education programs were received from 52 (96%) of these directors. Two states (Iowa and The Virgin Islands) indicated that their performance standards and measures had not been approved by their state board of education.

An initial letter was sent to each state director requesting documents describing the system of performance measures and standards that had been approved by their state board for vocational education. Approximately four weeks later, a follow-up letter, containing the original request, was sent to the 19 state directors that had not responded. A third and final follow-up letter was sent six weeks later to the remaining seven state directors that had not responded. Telephone calls were made to the remaining five state directors from whom no response had been received. All states (100%) then responded with information concerning their approved systems of performance measures and standards for secondary vocational education programs.

### **Analysis of Data**

Once the documents had been received, their content was analyzed. The analysis resulted in a listing, by states, of the measures that the states had

adopted, using the categories listed in section 115 of the Perkins Act of 1990: (a) basic academic skill, (b) advanced academic skill, (c) competency attainment, (d) work skill attainment, (e) retention/completion, (f) placement, (g) service to special populations, and (h) other measures. In addition to the measures, techniques used to assess performance were identified for each category listed above.

A summary sheet was developed for each state that presented the data on adopted measures. The summary sheets then were mailed to the state directors of vocational education. Personnel from each state were asked to review, verify, and amend the listing as necessary. When discrepancies occurred, a further review of the documents was carried out. If necessary, a follow up telephone call was made to the state director of vocational education office for additional clarification.

### Results

This section is organized according to the objectives of this paper. In the first part, the types of performance measures approved by the states will be discussed. In the second part, the types of assessment approved by states will be presented.

#### Objective 1: Determine the Type of Performance Measures Approved by States

This section reports the secondary vocational education standards approved by states according to the major categories required by the Perkins Act of 1990. These categories included academic and other performance.

Academic measures were categorized in two groups: basic and advanced. Fifty-eight percent of the states reported the use of one set of measures for both basic and advanced academics (McCaslin and Headley, 1993). Table 1 presents information concerning the number of states with approved measures. Measures were reported for the

academic areas of reading, mathematics, language, science, and other academic skills. The most frequently reported basic academic measures were in mathematics (85%), reading (80%), and language (77%). A total of 44% of the states indicated that they had approved "other" measures of basic academic skills, such as social studies, grade point average, critical thinking, and problem solving.

Table 1. A Summary of Approved State Measures for Academic Skills

Academic Skill	f	%
<u>Basic</u>		
Reading	43	80
Language	40	77
Mathematics	46	85
Science	19	35
Other	24	44
<u>Advanced</u>		
Reading	35	65
Language	35	65
Mathematics	41	76
Science	22	41
Other	23	43

The advanced academic skills were similar to the basic academic skills. Measures related to mathematics was approved most often by states (76%). This was followed by measures of reading and language at 65%. Less than one-half (41%) of the states reported measures in the area of science. The "other" category was reported by 43% of the states and included skills such as critical thinking, problem solving, and social studies. Six states did not report any approved measures of advanced academic skills.

Measures for other performance were categorized into five groups: (1) competency attainment, (2) work skill attainment, (3) completion, (4) placement, and (5) high school graduation rates. These groups corresponded with the requirements for performance measures and

standards outlined by the Perkins Act of 1990. States were not limited to adopting only the measures and standards outlined in the legislation. However, they were instructed to include at least one of the previously mentioned measures of performance (with corresponding standards), regardless of the number or type of additional measures approved. Since the Perkins Act of 1990 required states to offer incentives and adjustments for service to special populations, this study also examined any additional measures and standards dealing with service to those individuals and gender mix.

Following are the results of the 52 states that reported approved measures. Competency attainment, which was defined as basic employability skills, was reported by 44% of the states (Table 2). Work skill attainment (specific occupational skills attainment) was reported by nearly three-fourths of the states (72%).

Table 2. A Summary of Approved State Measures for Other Performance

Performance Measure	Approved Standard	
	f	%
Competency Attainment	24	44
Work Skill Attainment	39	72
Course/Program		
Completion	25	46
High School Graduation	27	50
Placement		
Related Placement	25	46
Any Placement	33	61
Service to Special		
Populations	28	52
Gender Mix	17	31

Program completion was reported by 46% of the states. High school graduation or its equivalent (i.e., General Equivalency Diploma) was reported by 50% of the states. About one-half (46%) of the states reported using related placement as a

performance measure. A total of 61% of the states reported using any placement as a performance measurement. The number of special populations served as a performance measure was reported as a standard by 52% of the states. Approximately one-third (31%) of the states used the percentage of males and females enrolled in vocational programs as a performance measure.

#### Objective 2: Indicate How States Planned to Assess Student Performance

In addition to examining the measures that had been approved by the states, this study also examined the types of techniques used in assessing academic performance. Four major types of techniques were identified: (1) state developed, (2) local selected or developed, (3) nationally recognized, and (4) other. State developed techniques included high school proficiency exams (e.g., The Ohio Ninth Grade Proficiency Test), and other state assessment programs (e.g., The Louisiana Education Assessment Program). Local developed techniques were those developed or selected by a local education agency. In some cases the state suggested some nationally recognized instruments for possible use by local education agencies. In other states, the choice of technique was left totally to the local agency. Nationally recognized techniques were those developed for use across states and in many cases had national norms (e.g., Iowa Test of Basic Skills). Other techniques included gain or progress in a course/program, or completion of course work.

State developed assessments were the most common type reported for measuring academic performance (Table 3). Local selected/developed and nationally recognized were the next most common methods of assessment in the areas of reading, language, and mathematics. More states had local selected/developed assessment techniques in the areas of science and other academic than the category of nationally recognized. The category of

Table 3. Type of Assessment Approved by States for Academic Performance

Type of Assessment	Reading		Language		Mathematics		Science		Other Academics	
	Basic	Adv.	Basic	Adv.	Basic	Adv.	Basic	Adv.	Basic	Adv.
<u>State Developed</u>										
Number	20	12	18	15	22	15	11	10	10	8
Percent	47	34	47	43	48	37	58	45	42	35
<u>Local Selected/Developed</u>										
Number	12	12	13	12	14	13	6	6	10	9
Percent	28	34	33	34	30	32	32	27	42	26
<u>Nationally Recognized</u>										
Number	16	13	12	10	14	11	4	3	2	3
Percent	37	37	30	29	30	27	21	14	8	13
<u>Other</u>										
Number	5	9	4	8	4	11	4	7	9	7
Percent	12	25	10	23	9	27	21	32	38	30

other tended to be used less than the other types of assessment.

In addition to examining the measures of academic achievement approved for use by the states, this study also analyzed information concerning the techniques used in assessing other performance. Five types of techniques used in assessing work skill attainment and competency attainment were identified: (1) state developed, (2) local selected or developed, (3) nationally recognized, (4) occupational licensure or certification, and (5) other techniques. State developed techniques were those developed for statewide use (e.g., Georgia Competency Checklists). Local selected or developed techniques were those developed or selected by a local education agency. Selection of techniques used in this category were totally at the discretion of the local agency. Nationally recognized techniques were those developed for use across states and in many cases had national norms (e.g., Work Keys by ACT). Occupational licensure and certification included those administered through a state,

professional or trade organization. Other techniques included, for example, completion of vocational course work or portfolios.

Competency attainment was generally defined by the states as rate of acquisition of basic employability skills. Twenty-four states (44%) reported assessing competency attainment of secondary vocational education students (Table 2). The most common type of competency attainment was that of local selected or developed (67%) as indicated in Table 4. State developed (29%) competency assessments were approved more often than that of nationally recognized assessments (21%).

Work skill attainment was defined as the rate of attaining occupational skill. Thirty-nine states (72%) reported assessing work skill attainment of secondary vocational education students (Table 2). Table 4 indicates that, for work skill attainment, local selected or developed was reported most often (69%). State developed assessment techniques had the next highest rate of 28%, followed by the other

category at 21%. Nationally recognized assessment techniques were reported least (5%).

Table 4. Type of Assessment Approved by States for Competency and Work Skill Attainment

Type of Assessment	Competency Attainment		Work Skill Attainment	
	f	%	f	%
State Developed	7	29	11	28
Local Selected or Developed	16	67	27	69
Nationally Recognized	5	21	2	5
Occupational Licensure or Certification	2	8	5	13
Other	7	29	8	21

For the remaining areas in which states planned to assess student performance, reporting assessment techniques were not appropriate because only percentage served or completed was collected. The number and percent of states reporting use of these assessment techniques and definitions of these areas are included in the following paragraphs.

Course/program completion was defined by the states as the number of students fulfilling program requirements. Twenty-five states (46%) reported collecting data on course/program completion rates.

Course/program completion was defined by the states as the number of students fulfilling program requirements. Twenty-five states (46%) reported collecting data on course/program completion rates.

High school graduation rate was defined by the states as the rate at which students graduate from school or achieve the GED (General Equivalency Diploma). Twenty-seven states (50%) reported collecting data on high school graduation rates.

Any placement referred to rate of placement on any job or continuing education after course/program completion. States defined related placement as the rate at which students are placed in jobs related to training or in further education after program completion. In almost every case, both types of placement also included military service. Forty-six percent of the states reported collecting data on related placement, while 61% reported collecting data on any placement.

States generally defined service to special populations as a measure of comparison between enrollment rates of general population students and special population students. Twenty-eight states (52%) specifically reported collecting data on service to special population students.

Gender mix referred to the percentage of male and female students enrolled in vocational programs. Seventeen states (31%) specifically reported collecting data on the participation of nontraditional gender participation in vocational programs.

## Recommendations and Implications

Traditionally, education systems have thought of accountability as measuring what goes into the education process. However, since the Perkins Act of 1990 the focus has changed to assessing program outcomes. The implementation of the state systems of performance measures and standards for vocational education programs requires that agricultural educators be cognizant of these new directions as they plan and evaluate their programs.

The measures and assessment techniques related to academic achievement require that both vocational and academic teachers rethink how these core subjects are taught. Since mathematics, reading and language were frequently indicated by states as approved measures, agricultural educators will need to place more emphasis on this outcome for their programs. Teaching of applied academics,

implementing Tech Prep, and increasing emphasis on team teaching by academic and vocational teachers are some avenues that should be considered.

Agricultural educators also need to be involved in and aware of new developments in the skill standard systems being developed by business and industry. The recent development of skill standards for biotechnology by the National FFA Foundation with input from business and industry is one example of this type of effort.

The emphasis on program outcomes requires that agricultural educators increase their knowledge and skills related to assessment. The heavy reliance upon locally-developed assessment techniques makes these competencies even more important for agricultural and other vocational educators.

It will be essential that the implementation of the state systems of performance standards and measures be monitored and evaluated in order to improve the assessment efforts in agricultural education. Advantages and disadvantages of these systems need to be identified. Information will also need to be collected on the validity and reliability of the assessment techniques that have been proposed.

### References

Carl D. Perkins Vocational and Applied Technology Education Act Amendments of 1990 (Public Law 100-392). (1990). Washington, DC: U.S. Congress.

Center for Law and Education. (1990). Guide to designing systems of standards and measures for evaluating the performance of vocational education programs. Cambridge, MA: Author.

Commission on the Skills of the American Workforce. (1990). America's choice: High skills or low wages! Rochester, NY: The National Center of Education and the Economy.

Hoachlander, E. G., Levesque, K., & Rahn, M. L. (1992). Accountability for vocational education: A practitioners guide. Berkeley, CA: National Center for Research in Vocational Education.

McCaslin, N. L. (1990). A framework for evaluating local vocational education programs. (Information Series No. 344). Columbus: Eric Clearing house on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED327738).

McCaslin, N. L. and Headley, W. S. (1993). A national study of approved state systems of performance measures and standards for vocational education. Columbus, OH: The Ohio State University.

Office of Educational Research and Improvement. (1995). The national assessment of vocational education. Final Report to Congress, Volume I, Summary and Recommendations. Washington: U.S. Department of Education.