

Assessing the Feasibility of a Test Item Bank and Assessment Clearinghouse

Strategies to Measure Technical Skill Attainment of
Career and Technical Education Participants

Assessing the Feasibility of a Test Item Bank and Assessment Clearinghouse

Strategies to Measure Technical Skill Attainment of
Career and Technical Education Participants

Seth Derner
Vivayic Corporation
610 J Street, Suite 210
Lincoln, Nebraska 68508

Steve Klein
MPR Associates, Inc.
205 SE Spokane Street, Suite 344
Portland, OR 97202

Don Hilber
DTI Associates, Inc
2920 South Glebe Road
Arlington, VA 22206

September 2008

Contents

Background 1

Section 1: Rationale for System Development 3

State Approaches for Assessing Technical Skill Attainment4

Section 2: Design Criteria 7

Components of a National System7

Defining State Assessment Needs: State Survey Findings.....8

Guiding Assumptions.....10

Section 3: Test Item Bank Design and Implementation Models..... 13

Design Drivers13

Item Bank Implementation Model.....25

Estimated Costs of Proposed Implementation Model.....26

Section 4: Clearinghouse Design and Implementation Models..... 29

Design Criteria.....29

Clearinghouse Implementation Model32

Estimated Costs of Proposed Implementation Model.....33

Conclusion..... 35

Suggested Future Action36

AppendixA-1

List of Tables

TABLE	PAGE
1	State Perkins measurement approaches: Program year 2009–20134
2	Test item bank and assessment clearinghouse features8
3	States rating test item bank features as extremely or very important.....10
4	Purposes for tests derived from test item bank.....15
5	Possible uses of the SCCI Cluster and Pathway performance elements and other derived standards.....17
6	Test item type options.....20
7	Options for test item bank implementation and deployment22
8	Test delivery and administration system options24
9	Estimated costs of the item bank implementation model.....28
10	Estimated costs of the assessment clearinghouse implementation model.....34

Appendix tables

A1	State survey responses.....A-4
A2	Overall interest in technical assessment system and its two main compo- nentsA-5
A3	Level of skills most interested in assessing.....A-6
A4	Standards most interested in using as the basis for assessmentsA-6
A5	States' likelihood of using the item bank and clearinghouse for various ac- tivitiesA-7
A6	Important uses of the item bank.....A-7
A7	Likelihood of providing support for the item bank.....A-8
A8	Amount of support willing to provide for item bank and clearinghouseA-8
A9	Amount currently being spent on collecting technical skill assessment data for Perkins reporting.....A-8
A10	Experience with technical skill assessments and interest in projectA-9
A11	Perkins measurement approaches and interest in projectA-9
A12	Interest in project by size of state.....A-9

Background

Career and technical education (CTE) coursework is offered in secondary and post-secondary institutions throughout the United States. Students completing a sequenced program of CTE coursework are expected to have mastered state- and/or industry-recognized academic knowledge and technical skills that prepare them to enroll in a community college, four-year college, or university; pursue advanced career training in a public or private proprietary institution; enter an apprenticeship program; obtain employment; or enlist in the military. In many instances, states have established statewide technical skill standards or specified guidelines to assist local education agencies in defining what students should know and be able to do.

As a condition for receipt of federal funding via the *Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV)*, states are required to assess students' attainment of challenging technical skill proficiencies that are aligned with post-secondary program or industry-recognized standards. Although a handful of states have established statewide secondary exams or contracted for third-party assessments, the majority lack standardized testing systems and the resources or political will to create them. At the postsecondary level, institutional tests tend to be occupationally focused and faculty driven, with standardized assessments, where they exist, drawn from existing national industry certification or state credentialing and licensing exams.

To support states in measuring students' technical skill attainment, the U.S. Department of Education, Office of Vocational and Adult Education (OVAE) is collaborating with the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the Association for Career and Technical Education (ACTE), and other technical education stakeholders to explore the feasibility of (1) establishing a test item bank containing questions submitted by various business, industry, and education sources, and (2) compiling an assessment clearinghouse containing information about industry-recognized national assessments that may be adopted or adapted for state use. It is anticipated that the adoption of either or both assessment systems will produce substantial economies of scale, granting educators access to a vast catalog of reliable industry-validated test items and exams for a fraction of what it would cost states to develop each system individually.

This report documents strategies that can be used to initiate development of a technical skill test item bank and/or assessment clearinghouse and quantifies the cost of creating and maintaining such a system. It is intended to inform state administrators on the potential uses and benefits of system participation, test developers on the needs and expectations of secondary and postsecondary educators, and federal policymakers on system capabilities and constraints. This report opens with a review of the rationale for creating a test item bank and assessment clearinghouse and includes a discussion of current state approaches to assessment and the drawbacks associated with existing systems. Section 2 summarizes findings from a survey of state administrators that was used to identify state testing needs and outlines the design criteria researchers will need to address to meet state needs. Sections 3 and 4 draw upon state-identified design components to propose an implementation model for the test item bank and assessment clearinghouse, respectively. Each section closes by identifying a recommended model and the cost estimates associated with its creation. The paper concludes with recommendations for initiating the nationwide development of a test item bank and assessment clearinghouse.

Section 1: Rationale for System Development

Accountability provisions contained within the Perkins IV legislation extend measurement expectations introduced in prior legislation. One significant departure from past practice, however, is OVAE's decision to issue nonregulatory guidance detailing preferred approaches for constructing state technical assessment measures. Specifically, states are encouraged only to report on CTE concentrators tested using a state-established technical skill assessment or with a third-party, industry-recognized certification or credentialing exam.¹ Concentrators in courses or programs for which such assessments do not exist may be excluded from the measure, though states must document the percentage of individuals tested and their plans for expanding the use of state-established or national industry-recognized assessments to additional program areas.

These new technical assessment guidelines are intended, in part, to remedy measurement deficiencies noted by the Office of Management and Budget (OMB) in its review of the federal Perkins Act, using its Program Assessment Rating Tool (PART).² Labeling Perkins as ineffective, primarily due to the lack of a common standard of validity and reliability in state performance measures, the OMB finding has been cited by some policymakers calling for the elimination of Perkins program funding. Changes in the measurement approach also are intended to provide students with a means of directly demonstrating their knowledge and skills, allowing for their improved transition from secondary to postsecondary programs of study and in conveying proof of skill mastery to potential employers.

¹ Perkins IV defines a *CTE concentrator* as a secondary student who has earned three (3) or more credits in a single CTE program area (e.g., health care or business services) or two (2) credits in a single CTE program area, but only in those program areas where two credit sequences at the secondary level are recognized by the state and/or its local eligible recipients. A postsecondary/adult *CTE concentrator* is one who (1) completes at least 12 academic or CTE credits within a single program area sequence that is made up of 12 or more academic and technical credits and terminates in the award of an industry-recognized credential, a certificate, or a degree or who (2) completes a short-term CTE program sequence of less than 12 credit units that terminates in an industry-recognized credential, a certificate, or a degree.

² The PART rating can be accessed at <http://www.whitehouse.gov/omb/expectmore/summary/10000212.2002.html>.

State Approaches for Assessing Technical Skill Attainment

To date, states have attempted to develop performance measures for technical skill attainment that balance federal data needs with state capacity and resources to collect data. While some states have pioneered statewide assessment systems or have contracted for third-party exams that conform to high standards of validity and reliability, others have adopted indirect measures, such as program completion or grade point average (GPA), to proxy student attainment.

4

A review of state measurement approaches proposed in states' five-year Perkins plans suggests that federal nonregulatory guidance may be helping to reduce the variability in states' constructions of secondary measures, though postsecondary measures are less consistent. As illustrated in Table 1, 44 of 53 state secondary agencies (83 percent) are planning to use state-approved or national assessments to assess CTE concentrators' technical skill attainment, compared to 34 of 53 state postsecondary agencies (64 percent). Grades and cumulative GPAs, which may provide more subjective measures of student learning, are the second most prevalent measurement approach being used among states using alternative construction strategies.³

Table 1. State Perkins measurement approaches: Program year 2009–2013

Measurement approach	Secondary	Postsecondary
National or state-approved assessment	44	34
Grades or GPA	4	10
Program completion	2	1
Assessment and program completion	0	1
Completion of 80 percent of standards	1	0
Mastered industry-validated standards	1	0
Course completion	1	1
Assessment and grades	0	5
Completed degree/certificate or transferred within four years	0	1

SOURCE: U.S. Department of Education, Office of Vocational and Adult Education.

This fragmented approach to state testing means that students across, and often within states, are assessed on differing technical content, using a range of assessment

³ Care must be taken, however, when interpreting these findings. Past experience suggests that measurement approaches that appear similar in structure may produce substantially different results, because states may adopt differing criteria to define CTE concentrators, differing constructions to measure numerators and denominators, and differing methodologies to collect student data.

Conclusion

The technical skill test item bank and assessment clearinghouse models proposed within this report are intended to support states in assessing the skill attainment of students participating in CTE coursework and programs. The proposed systems are both conceptually and technically feasible, given sufficient fiscal resources and development lead times. It is anticipated that the design criteria and implementation models proposed in this report can serve as a starting point for developing an RFP that would stipulate the design features and operational requirements for each component of the assessment system.

Clarifying system ownership and securing start-up funding are likely the two most critical impediments to system creation. Although development and management of the test item bank and assessment clearinghouse need not reside with a single organization, it is crucial that the operator of each is seen as a credible agency that can command the allegiance of all states participating in the project. While it is assumed that the federal government will not take responsibility for financing or for providing project oversight, it is anticipated that federal staff will provide continuing guidance to system developers to ensure that the testing system will support states in responding to Perkins accountability requirements. It may also be advisable to create an oversight board, composed of state representatives and testing experts, to keep the oversight focused, on-track, and fiscally responsible.

Test item bank ownership is complicated because there are many public and private organizations that have a financial stake in administering CTE assessments. Agencies such as the SCCI, which developed the Career Clusters and Pathways model and identified the knowledge and skill statements within pathways, also have a professional stake in system design. To reduce competitive pressures that could lead to the creation of multiple, overlapping assessment systems, test developers and representatives of state CTE associations should be consulted to explore the options for a collaborative approach to system creation. For example, it may be possible for two or more test developers to collaborate in the design of the test item bank and/or assessment clearinghouse, with different agencies taking responsibility for different assessment system features.

Securing implementation funding will also be difficult given the uncertainty associated with system use and profitability. Potential vendors may be hesitant to invest

large sums for upfront development in the expectation that states will sign up to participate once the system is created. State education agencies, in turn, may be unwilling (and unable, given current budget shortfalls) to invest substantial resources or staff time in a collaborative effort to build a national assessment system that someday may meet their assessment needs.⁸ Concerns could potentially be reduced if participating states were made co-owners of the assessment system or if system development were underwritten, in full or in part, by a third-party agency.

Suggested Future Action

Creation of a nationwide technical skill assessment system will require securing buy-in on system purposes from a wide range of stakeholders, including the federal government, state secondary and postsecondary education agencies, and CTE professional associations. Consultations with test developers and employer groups will also be necessary to ensure that the proposed system is conceptually, technically, and economically feasible. This report proposes developing a test item bank and assessment clearinghouse to meet identified state needs. While the design criteria and implementation models contained within this report appear viable, additional consultation is needed to review and, where necessary, overhaul or refine proposed system features.

To initiate this process, task force members recommend that OVAE use existing project resources to convene a one-day meeting of assessment experts—including testing coordinators, state secondary and postsecondary administrators, and representatives of CTE professional associations—to review recommendations contained within this feasibility report. Based on meeting conversations, it may be possible to secure agreement on a work plan for system development, including identifying a final, agreed-upon set of criteria for configuring an assessment system and the likely fiscal requirements for initiating development. It is anticipated that the product of this work plan will include an RFP that can be circulated among potential system developers, and shared with potential outside funders, to drive system creation.

⁸ While Perkins accountability requirements may initially have helped promote state interest in creating a national assessment system, the recent approval of states' five-year Perkins plans may dampen enthusiasm in states whose technical skill attainment measures have been accepted. States' interests will likely increase if OVAE holds states accountable for increasing the number of students tested using industry-recognized, valid, and reliable assessments. Interest in workforce development issues and the continued refinement of the SCCI Career Clusters and Pathways model may also help to maintain momentum for creating national technical skill assessments.

Appendix

Results of State Survey

Purpose of Survey

The purpose of the survey was to gather information and input from all states on their interest in, use of, and support for the proposed national test item bank and assessment clearinghouse. Questions were designed so that results could be aggregated, in order to determine the number of states that might ultimately participate in the project and how their most important needs might influence the design and development of the project. Each state was asked a number of questions concerning these four topics:

- Current status of technical skill assessments—whether the state has a system in place at either the secondary or postsecondary level or both, and if so, its major characteristics.
- General interest in a national system—based on the state’s view on whether to proceed nationally with this particular vision, what skills it intends to assess, and what standards it intends to use as a basis for assessments.
- Expected degree of participation in a national system—focusing on the usefulness of various features of the proposed item bank and clearinghouse.
- Support for a national system—in terms of start-up funding, operational funding, and supplying information.

Methodology

Survey Instrument

The survey was developed by the Technical Assessment Master Assessment Plan Task Force, based on feedback the group received after announcing and presenting its ideas to states at a Webinar on February 11, 2008. Specific questions were developed around each of the four topical areas listed above. Most questions were composed with closed-ended, pre-determined categorical responses in order to expedite tabula-

tion and analysis and to assure aggregation. The survey was converted into a format suitable for Survey Monkey, so the collection could occur online.

Collection Process

All states were invited to participate in the survey through a log-in ID and password provided to the State Director of Career and Technical Education. The respondent did not have to be this director, per se, but did have to identify himself or herself. Most states responded once, though they were allowed to have two responses if they chose, one each for secondary and postsecondary. Three states opted for this dual reply. All respondents were asked if their replies applied to both secondary and postsecondary, or just one of the two. The collection window was open for two weeks in March 2008.

A-2

Survey Tabulation

Responses were collected into two Excel databases, one that contained the full text for each cell and one that contained numeric assignments of each reply into a predetermined code. The file was edited and cleaned to assure completeness, and states were segregated by secondary and postsecondary responses as needed for proper accounting. Numeric responses were aggregated and/or averaged as appropriate for each question and were tabulated into a master file containing all the questions and the number of responses for each categorical option. Tables A1 through A9 summarize these aggregates into a more presentable format, but maintain all of the potential categories that could have been answered.

Tables A10, A11, and A12 combine information from the survey with other data gathered from states (both prior to and after the survey itself), in order to highlight the interrelationship among states in terms of their interest in the project, the experience states have with technical skill assessments, and whether they are using assessments to meet newly established Perkins reporting requirements. This additional information stemmed from data gathered from states in May 2007 in preparation for the Data Quality Institute and from approaches submitted by states in May 2008 in their final Perkins State Plan. These additional sources of information provide a way to analyze the proposed project from the perspective of the 23 states that did not complete the entire survey, along with the 31 states that did.

Analytical Methods

The method for analyzing these data is exclusively through the use of descriptive statistics. Absent any compelling research questions and given the small number of responses (limited by the number of states), no attempt has been made here to explore

correlations between factors or to test the differences among groups of states. Descriptive statistics are suitable for the purposes of this project, which is mainly to ascertain the aggregate level of interest in various project features.

Summary Tables

Current State Status

Table A1. State survey responses

Responses	Number of states	Percent of respondents (n = 37)	Percent of universe (n = 54)
All responses	37	100	69
Joint secondary and postsecondary	24	71	44
Secondary only	5	14	9
Postsecondary only	5	14	9
Separate responses*	3	8	6
<i>Did not participate in survey</i>	17	—	31

— Not available/applicable.

* The three states with separate responses for secondary and postsecondary were merged into a combined response for each of the three states, with answers averaged for each response for those questions that were not clearly aimed at secondary or postsecondary status, interest, and participation.

Interest in National Technical Skill Assessment System

Table A2. Overall interest in technical assessment system and its two main components

Type of state respondent	Number of states interested in using resources from national item bank or clearinghouse	Number of states not interested in using resources from national item bank or clearinghouse	Number of states interested in pursuing national item bank (with degree of interest)	Number of states interested in pursuing national assessment clearinghouse (with degree of interest)
All states	31	6		
Both secondary and postsecondary	21	3		
Secondary only	4	1		
Postsecondary only	3	2		
Separate replies	3	0		
All interested states			31	31
Strongly agree			15	21
Somewhat agree			15	10
Somewhat disagree			1	0
Strongly disagree			0	0
<i>Not interested</i>			6	6

NOTE: Only interested states were asked the follow-up question as to their degree of interest in the two project components and all subsequent questions summarized in these tables.

Reasons Given for Lack of Interest:

- Still uncertain as to how this will address our state competencies. Testing is an expensive endeavor.
- Need to know more about what levels of participation are offered and need to talk to the various segments of our college faculty about their interest.
- We are using industry-recognized assessments and credentials. Unless the assessments were valued by industry, we would see little benefit to them beyond using them as formative measures.
- Cost and relevancy to our local community college programs that include the whole occupation and not just a small segment.
- An item bank will not solve the issue of technical skill assessment.
- Plan to develop assessments for those degree programs that do not have a national/state licensure exam and/or a capstone course.

Table A3. Level of skills most interested in assessing

Skills	Number of states	
	Secondary	Postsecondary
General work readiness or employability (across all clusters)	12	10
Foundation-level skills common to a cluster area	15	7
Pathway-level skills within a cluster area	19	15
Specific occupational skills within a pathway	19	28
Other	5	2
Not sure*	6	6
All interested states	31	31

* Some of the "Not sure" replies were from respondents from secondary or postsecondary institutions who could not place an answer in categories that pertained to the other type.

Table A4. Standards most interested in using as the basis for assessments

Standards	Number of states	
	Secondary	Postsecondary
Cluster and/or pathway, based on knowledge and skills statements identified by States' Career Clusters Institute	12	7
Cluster and/or pathway, established by own state	11	5
Employability and general work readiness, identified by professional and/or trade associations	13	10
Occupationally specific, developed by the state	6	10
Occupationally specific, developed by third-party professionals and/or trade associations	19	22
Other	2	3
Not sure*	5	5
All interested states	31	31

* Some of the "Not sure" replies were from respondents from secondary or postsecondary institutions who could not place an answer in categories that pertained to the other type.

Participation in National Item Bank and Clearinghouse

Table A5. States' likelihood of using the item bank and clearinghouse for various activities

Activity	Number of states responding					Do not know or not applicable
	Extremely likely	Very likely	Somewhat likely	Not very likely	Not at all likely	
Creation of standard secondary assessments based on SCCI knowledge and skills statements	4	8	8	3	1	7
Creation of standard postsecondary assessments based on SCCI knowledge and skills statements	1	4	11	7	2	6
Creation of customized statewide secondary assessments	6	9	6	5	0	5
Creation of customized statewide postsecondary assessments	2	3	10	11	0	4
Access test information in clearinghouse to identify secondary assessments	9	11	6	0	0	4
Access test information in clearinghouse to identify postsecondary assessments	4	9	13	2	0	3

NOTE: Based on replies from the 31 states interested in using resources from national test item bank and assessment clearinghouse.

Table A6. Important uses of the item bank

Use	Number of states responding					Do not know or not applicable
	Extremely important	Very important	Somewhat important	Not very important	Not at all important	
Create customized statewide assessments for secondary	9	13	3	2	0	4
Create customized statewide assessments for postsecondary	3	12	7	5	0	4
Allow access to states to choose items and create own assessments	7	12	8	2	1	1
Allow access to school districts to choose items and create own assessments	0	7	9	8	4	3
Allow access to faculty and teachers to choose items and create own assessments	0	6	10	9	5	1
Provide online delivery / administration	12	10	5	0	0	4
Collect and aggregate data for Perkins reporting	16	7	7	0	0	1

NOTE: Based on replies from the 31 states interested in using resources from national test item bank and assessment clearinghouse.

Support for National Item Bank and Clearinghouse

Table A7. Likelihood of providing support for the item bank

Area	Number of states responding					Do not know or not applicable
	Extremely likely	Very likely	Somewhat likely	Not very likely	Not at all likely	
Submit questions to the item bank	2	6	9	10	1	3
Provide start-up funding to seed the item bank	1	1	8	8	6	7
Provide annual funding to access the item bank	1	3	11	6	4	6
Other	(*)	(*)	(*)	(*)	(*)	(*)

* Six comments provided.

A-8

Table A8. Amount of support willing to provide for item bank and clearinghouse

Amount available	Number of states for	
	Start-up development	Annual ongoing
Unable to provide resources	3	2
Less than \$5,000	2	2
\$5,000–\$10,000	1	2
\$10,001–\$20,000	2	2
\$20,001–\$30,000	0	1
\$30,001–\$40,000	0	0
\$40,001–\$50,000	1	0
More than \$50,000	0	0
Total with dollar amounts specified	9	9
Unable to specify a dollar amount	22	22

Table A9. Amount currently being spent on collecting technical skill assessment data for Perkins reporting

Amount	Number of states for	
	Out-of-pocket (state funds plus Perkins funds)	State and local staff time
Less than \$10,000	4	5
\$10,001–\$35,000	5	1
\$5,000–\$10,000	0	3
\$10,001–\$20,000	2	1
Unable to estimate expenditure	20	21

Interest in All States by Experience, Approach, and Size

Table A10. Experience with technical skill assessments and interest in project

Interest in project	Experienced (all but one at secondary level only)	Not experienced
Interested in project	4	27
Interest at secondary level only	2	4
Interest at postsecondary level only	1	1
Interest at both levels	1	22
Not interested in project	8	15

A-9

Table A11. Perkins measurement approaches and interest in project

Measurement approach to be used for technical skill attainment core indicators	All states interested in project	States experienced and not interested	States not experienced and not interested	Total using approach
Secondary				
Assessment: national or state approved	25	8	11	44
Assessment combined with another approach	1	0	0	1
Completion (program, course, or percent of standards)	1	0	4	5
GPA	4	0	0	4
Postsecondary				
Assessment: national or state approved	20	4	9	33
Assessment combined with another approach	5	2	0	7
Completion (program, course, or degree)	1	0	3	4
GPA	5	2	3	10
Total in Category	31	8	15	54

Table A12. Interest in project by size of state

Interest in project	Large states	Medium states	Small states
Interested in project	10	9	12
Interest at secondary level only	4	1	0
Interest at postsecondary level only	0	2	1
Interest at both levels	6	6	11
Not interested in project	7	9	7
Total in category	17	18	19

NOTE: Based on 2007 total population, with cutoffs of 6 million for large-sized and 2 million for medium-sized populations.