MPR
Associates, Inc.

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Academy for Educational Development

Assessing Technical Achievement in Secondary Career Technical Education

Overview of State Assessment Systems

Prepared for:

National Research Center for Career and Technical Education
1954 Buford Avenue
St. Paul, MN 55108-6197

Submitted by:

MPR Associates, Inc.
2150 Shattuck Avenue, Suite 800
Berkeley, California 94704

&

Academy for Educational Development
National Institute for Work and Learning
1825 Connecticut Avenue, N.W.
Washington, D.C. 20009-5721

Contact:
Steven Klein
(sklein@mprinc.com)
503-675-6619

States are using a variety of approaches to assess secondary students' career technical education (CTE) skill attainment under Perkins. According to data reported in the U.S. Department of Education's *Report to Congress on State Performance, Program Year 2002-03*, states and territories are currently using the following approaches to collect performance data for the CTE skill attainment measure:

- National/State/Local Assessment Systems — 30 states
- Grade Point Average in Occupational Subjects — 9 states
- Program Completion — 8 states
- Course Completion — 7 states

Although it appears that grantees have limited their measurement to these four collection strategies, with most using some form of national, state, or local assessment system, in practice state accountability systems produce very different types of data, even when controlling for measurement approach. For example, states using national assessments may tailor exams to address state CTE standards, include different students in their population base, or establish different performance thresholds to indicate skill attainment. Consequently, there is presently little consistency in how states assess CTE skill attainment for Perkins reporting purposes.

A review of state measurement approaches conducted for this paper indicates that roughly one-third of states (36 percent) are using some form of vendor-developed assessment system, or their own state-established exam to collect skill attainment data for Perkins reporting purposes. Many states are concurrently using state licensing or industry credentialing exams to award skill credentials to secondary students, although not all choose to report this information for Perkins accountability purposes.

This paper summarizes three strategies that states are using to quantify students' CTE skill holdings: national assessments systems; state developed occupationally specific, end-of-course or program exams; and state-developed, occupationally generic, end-of-program exams. The paper also profiles collection systems in a subset of states representative of each assessment approach. State profiles detail the (1) primary characteristics of state assessment systems (2) process and cost of developing assessments; (3) test administration policies and procedures; and (4) the potential portability of these systems to other states. This information is intended to help inform

policy discussions that will occur at an upcoming, OVAE-sponsored conference on student CTE skill assessment hosted by the National Research Center for Career and Technical Education.

Identification of Sources: Data Collection Methodology

To profile state measurement strategies, MPR researchers reviewed the extent literature on state assessment systems. This included conducting web searches of reports available on the Internet, information posted on the website of the National Research Center for Career and Technical Education (www.nccte.org), the National Association of State Directors of Career Technical Education (www.careertech.org), the National Occupational Competency Testing Institute (www.nocti.org), VTECS (www.vtecs.org), WorkKeys (www.act.org/workkeys), and OVAE's Peer Collaborative Resource Network (www.edcountability.net).

Researchers also conducted on-line searches of resources available within state department of education websites for states identified as having developed or implemented standardized assessments based on national or state CTE standards. States identified for initial follow-up included—Arizona, Arkansas, Connecticut, Idaho, Illinois, Missouri, New Jersey, Pennsylvania, North Carolina, Kentucky, New York, Ohio, Oklahoma, Utah, Vermont, Virginia, West Virginia, and Wyoming.[1]

Based on a review of state information, researchers selected a subset of states using innovative strategies that were judged illustrative of the differing approaches used to assess student performance. These included—***Connecticut, Kentucky, North Carolina, Pennsylvania, Utah,*** and ***Wyoming***. Researchers summarized the characteristics of these state systems using a common protocol to extract information (see Appendix A). State profiles were shared with administrators in participating states, with contacts asked to review the description of their state assessment approach and, where necessary, to make any modifications to ensure that the write-up accurately captured the mechanics of state testing procedures.

[1] While every attempt was made to ensure that states using either a national or state developed, standardized assessment were included, it is possible that there are some states were inadvertently excluded.

STATE ASSESSMENT APPROACHES

An analysis of state reporting approaches indicates that roughly one-third of states are using some form of standardized national and/or state assessment to collect data for Perkins accountability purposes or to award CTE skill certificates in addition to a regular high school diploma. Generally, states fell into one of three assessment categories. Some states have opted to use national assessments to track student performance, with third-party, occupationally specific tests serving as the primary assessment tool. Other states have established their own occupationally specific assessments, administered to students following program or course completion. And one state has developed a unique, performance-based assessment to document student attainment of generic work-readiness skills common to all CTE program areas.

Since considerable differences were noted in assessment approaches across the group of eighteen states selected for follow-up, as well as among states using similar assessment strategies, researchers selected a subset of six states that were deemed to be using innovative assessment systems. This section briefly describes the assessment approach used in each of the states identified for this study, with detailed descriptions provided for the six states selected for profiling.

Strategy 1: National Assessment Systems

Four states—***Connecticut, New Jersey, Pennsylvania,*** and ***Virginia***—currently assess student skill attainment for Perkins using standardized, end-of-program exams developed by third-party vendors, state licensing agencies, or national business and industry associations. A number of other states, including ***Idaho, New York*** and ***Vermont***, encourage local districts to adopt national exams, but have yet to institute a formal statewide assessment system for Perkins reporting purposes. Finally, ***Arizona*** and ***Massachusetts*** are in the process of assessing the feasibility of using standardized, vendor-developed exams to structure CTE reporting in advance of the Perkins reauthorization.

Although each of the identified states uses a combination of assessment strategies to measure skill attainment, most have contracted with, or rely upon the National Occupational Competency Testing Institute (NOCTI) to serve as their primary testing agent. Generally, these states have either worked with NOCTI to develop customized, program specific assessments that align with

their own CTE performance standards, or have authorized the use of existing NOCTI assessments for statewide use.

In addition to NOCTI, identified states are also using their own credentialing exams that are administered by state licensing agencies. These assessments are typically associated with occupations that affect the health or well being of the public, including the health fields, barbering, and cosmetology. Standardized credentialing exams created by national industry associations are also in use. For example, most states have adopted exams created by the National Institute of Machining Skills, Inc. (NIMS) to assess machining and metalworking, and the National Automotive Technicians Education Foundation (NATEF) for automotive repair.

In addition to statewide occupationally specific assessments, some states are using ACT's WorkKeys system to assess student attainment of generic career readiness skills, although no state currently employs the test as its statewide Perkins CTE assessment. According to ACT representatives, the WorkKeys *Applied Mathematics* and *Reading for Information* exams are currently used in ***Illinois***, and will soon be introduced in ***Michigan***, to test all secondary students as part of a statewide assessment system. WorkKeys exams are also employed in some secondary school districts, and more widely at the community college level, to assess students' general work readiness skills.

About the NOCTI and WorkKeys Exams

Most identified states rely on NOCTI to develop and administer a relatively larger proportion of their CTE assessments. NOCTI exams are occupationally specific, meaning that they are designed to assess specific technical skills in a narrow occupational area. The exams are developed by teams of business, industry, and education experts who work to distill critical competencies from occupational and workplace standards. Academic standards embedded within occupations may also be distinguished. Identified skills are used to construct an occupationally specific Job Readiness exam, which prior to release, is piloted in schools around the nation to assess student performance. This development process is intended to ensure that NOCTI exams are valid and reliable measures of occupational content. The organization has profiled 87 Job Ready Assessments for use by secondary agencies, nearly all of which assess occupationally specific skills associated with a discrete CTE program area (three exams focus on general workforce readiness skills). A list of NOCTI exams is included in Appendix B.

The NOCTI Job Ready Assessments consist of a written and performance testing component. Written exams usually consist of 150 to 200 multiple-choice questions, which may be administered either on-line or using traditional paper-and-pencil methods. Students have up to three hours to complete their written assessment, although states may tailor exams to provide shorter testing periods. Performance exams typically have 3 to 5 simulated tasks that students must perform. Performance outcomes are scored by advisory council members or teachers, and may be sent to NOCTI for further processing.

In addition to test development, NOCTI also provides support services to assist states in administering and scoring exams and in reporting student outcomes, using both norm and criterion-referenced scoring criteria. Test results are compiled and sent back to the state to support program improvement efforts and to comply with federal and state accountability requirements.

It appears that NOCTI is seeking to position itself as the default testing agency for Perkins. In an effort to increase business, in September 2005 NOCTI launched a testing initiative geared at encouraging states to adopt NOCTI exams to support CTE assessment. Specifically, the organization has revamped its pricing structure to offer discounted services based on the volume of assessments used, and has increased the type of services offered. For example, states will now be able to bank assessment credit from year-to-year, have access to a customized statewide electronic newsletter, and be provided with a state-branded, online delivery system.

Although no state is currently using WorkKeys as its Perkins technical skill attainment measure, WorkKeys is a unique assessment designed to assess individuals' general work readiness skills across a number of dimensions. Assessments exist in ten content areas, including:

- *Reading for Information*
- *Applied Mathematics*
- *Business Writing*
- *Writing*
- *Locating Information*
- *Teamwork*
- *Observation*
- *Listening*
- *Applied Technology*
- *Readiness (screening assessment)*

Unlike the NOCTI exams, which measure occupationally specific skills in a specific occupation, WorkKeys assessments measure basic skills that all workers require to succeed in the workplace. For example, the *Reading for Information* test measures the skills that people need to read and use written information as part of their job. Test items require individuals to read and interpret a variety of workplace communications, including memos, letters, directions, signs, bulletins, policies and workplace regulations. Other tests assess other broad, career-readiness skills.

Educators and employers can use WorkKeys to assess whether individuals have the skills needed to succeed in the labor market in general, or in a specific occupational area. To do so, WorkKeys has profiled the skills required for success in any of 10,000 job titles, ranging from accountant to welder. These skill levels have been cross-referenced with WorkKeys skill levels that an individual must have to perform successfully. By comparing occupational job profile data with students' WorkKeys test scores, an educator or employer can reliably predict whether an individual has the skills needed for success.[2] Although WorkKeys has not, to date, achieved as widespread use at the secondary level as NOCTI, it has the potential to serve as a cost-effective approach for assessing the work readiness skills of all students pursuing studies in occupations that share a similar base of skills, such as those found within a career cluster area.

National Assessment State Profiles: Connecticut and Pennsylvania

To illustrate state approaches using national assessments, this paper profiles assessment systems used in ***Connecticut*** and ***Pennsylvania***, which have taken slightly differing approaches to instituting CTE assessments (see Appendix C for a detailed summary of state systems). In particular, ***Connecticut*** has partnered with NOCTI to create customized exams that align with state-identified CTE performance standards and competencies, as well as nationally recognized industry standards. Since educators are required to align their curriculum with state CTE standards as a condition for receiving state funding, tailoring NOCTI exams to existing state standards has helped ensure that CTE educators are preparing students for assessment success.

Pennsylvania, in contrast, has opted to assess students' skill attainment using existing, NOCTI Job Readiness Assessments.[3] This has required that state educators reevaluate their curriculum to ensure that students are being prepared for the test. Since the state had not adopted a set of performance standards for CTE—a generic set of standards is currently in development—local administrators are encouraged by the state to identify gaps between their local curriculum and national standards.

To help align curriculum, Pennsylvania educators are encouraged to draw on NOCTI resources, which include assessment blueprints that have been developed for each of the organization's Job

[2] Information drawn from ACT's WorkKeys website: http://www.act.org/workkeys/index.html

[3] During initial development, the state also worked with NOCTI to align CTE assessments in approximately 20 high use occupational areas with the Pennsylvania math standards. This was done in an attempt to assess the contribution that CTE makes to students' academic attainment: scores on the state academic assessment in the 11th grade were to be compared with scores on students CTE assessment administered in the 12th grade.

Ready Assessments. NOCTI blueprints provide an outline of the assessment instrument, identify core competencies and tasks associated with the exam, and provide sample questions and jobs for which the assessment would apply. Since a good school curriculum is one based on the critical core competencies required within an occupation, NOCTI contends that there should already be a high degree of correlation between NOCTI assessment content and secondary curriculum.

In addition to the pedagogical implications of aligning (or failing to align) state standards with assessments, there are also fiscal tradeoffs between the two state approaches. In ***Connecticut***, the cost of aligning NOCTI exams with state standards required that the state make an initial investment, estimated at $300,000, to align 18 CTE assessments. In contrast, Pennsylvania incurred no quantifiable cost in adopting NOCTI, since local districts rely on 'off-the-shelf' exams for assessment purposes. However, since educators may have been required to revamp their curriculum to comply with NOCTI assessments, it is likely that districts incurred some cost in shifting to the new assessment approach.

Both states have contracted with NOCTI to administer annual exams (either on-line or in paper and pencil format), and to score and report assessment outcomes to the state. The per-student cost of administering a Job Ready Assessments varies with the type of assessment and manner in which it is administered. For the 2005-06 school year, NOCTI charged states $20 for each student who was administered an on-line multiple-choice exam and had a performance rating entered, and $25 for each student administered a paper/pencil multiple choice exam and a paper/pencil performance rating entered. Costs vary with the options selected. According to state administrators, ***Connecticut*** spent approximately $265,000 and ***Pennsylvania*** approximately $540,000 in assessment costs in the 2004-05 school year.

National Assessment: Other State Testing Efforts

A number of states, including ***New Jersey*** and ***Virginia,*** are using NOCTI exams in conjunction with tests developed by national business and industry groups. For example, ***New Jersey*** recognizes both NOCTI and VTECS tests, in that order, as acceptable measures of student CTE skill proficiencies. The state also accepts industry-endorsed competency exams in fields in which licensure is required or exams are recognized by the National Skill Standards Board.

In ***Virginia***, which bases Perkins reporting on student attainment of state-identified CTE competencies, the State Board of Education has provided for students to obtain a CTE seal on their high school diploma. To earn a seal, students must fulfill the requirements for a standard or advanced studies high school diploma, complete a prescribed sequence of courses in a CTE program, and either (1) maintain a B or better average in CTE courses, (2) acquire a professional license in a CTE field, or (3) pass an exam that confers certification from a recognized industry or professional association. As part of this requirement, the state has compiled a list of acceptable national industry certification exams (e.g., ASE), as well as endorsed 48 NOCTI occupational competency exams.

New York students who successfully complete a NOCTI or other national industry exam are also eligible to earn a technical endorsement on their high school diploma. (For Perkins reporting purposes, the state reports on the vocational-technical GPA of CTE concentrators.) Since the state does not approve, endorse, or certify technical assessments, school district or career technical high school administrators are free to select their own assessments from a state-identified pool of exams. To assist local districts in identifying qualifying national and state assessments, the state has compiled a list of exams and the sponsoring organizations in each trade area. For example, districts interested in offering a technical endorsement in welding may consult with the American Welding Society, New York State Department of Transportation, or NOCTI to identify exams.

Similarly, in ***Idaho***, which does not have a single statewide assessment, local districts assess student skills by selecting their own exams. Districts choose from a variety of options, including those produced by NOCTI, as well as developed by other states. The state of ***Vermont*** also seeks to provide students with access to industry-recognized credentials in areas where credentials exist. The state is seeking to identify credentials at the highest levels possible that meet a program's focus and that stay abreast of industry standard/credentialing options as they develop.

Finally, conversations with educational administrators in ***Arizona*** and ***Massachusetts*** indicate that these states are in the process of working with NOCTI to identify occupationally specific exams that local districts can use to assess student skills. States are still early in their development process, however, and currently working to determine a price structure, organization, and funding source to structure their testing programs.

In sum, a small number of states are contracting with NOCTI or adopting credentials developed by national industry groups or professional associations to structure their CTE assessments. There

are several advantages in using industry-developed assessments for local use. Adopting industry-developed exams means that students are assessed for workplace skills that employers' value, ensuring that instruction is aligned with industry needs. States can also avoid upfront development cost associated with designing assessments for each of the program areas offered within the state, along with the responsibility of having to update exams to keep pace with industry developments. Subcontracting assessments can, however, mean that states are forced to rely on a third-party agency to determine the content of their CTE assessments, as well as incur an ongoing, per student cost in administering and scoring student exams.

Strategy 2: State Developed, Occupationally Specific, End-of-Course or Program Exams

Seven states—***Kentucky, Mississippi, North Carolina, Ohio, Oklahoma, Utah,*** and ***West Virginia***—have established end-of-course or program assessments, aligned with state standards, to assess student CTE skill attainment. With some exception, these state-developed tests tend to be program specific, meaning that students must demonstrate occupational specific skills associated with a discrete occupational area. As might be expected, there is considerable variation among states in how these assessments are structured.

State Assessment Design

The development of state assessments typically begins with states establishing a core set of CTE standards and competencies within a given program area. This process usually entails convening a group of state educational and workforce experts, including state and local CTE administrators, CTE educators, and business and industry representatives. Committee members are tasked with assessing state and national employer needs and surveying existing national standards for occupations associated with a given program area.

Once a set of CTE competencies are identified and validated, committee members, with the support of testing experts, begin developing test questions, and in some cases, performance tasks that align with identified standards. Initial tests are usually piloted with a subset of schools to assess the validity and reliability of exam questions. Skill standards may also serve as a basis for developing instructional materials or a statewide curriculum that is aligned to state assessments.

While creating exams in this way can increase buy-in among educators, drafting state standards and assessment can be an expensive process. Given the large number of CTE courses or programs that are offered, developing a statewide, occupationally specific testing program can require that

states invest substantial resources in identifying and validating the technical skills employers desire in a range of programs, and in designing assessments that align with these standards. Unfortunately, the literature provides relatively little guidance on the actual cost of developing state standards, in part because system development often takes place over many years, and in part because not all costs (e.g., task force members' time) is accurately quantified.

State End-of-Program Assessment: Kentucky, North Carolina, and Utah

To illustrate the structure of state testing programs, this section profiles three states—***Kentucky*** and ***Utah***—which base assessment on state-developed, end-of-program exams, and ***North Carolina***, which structures assessment around state-developed, end-of-course exams. A detailed description of these systems is provided in Appendix D.

States establishing their own testing systems must often create a large number of assessments to achieve program coverage. To date, ***North Carolina*** has developed roughly 130 end-of-course curricular blueprints and assessments, while ***Utah,*** which offers end-of-program assessments, has established 133 occupationally specific exams. However, not all states have sought to develop assessments for all occupations: ***Kentucky*** has confined assessments to 19 content areas, in most cases using one exam to address multiple career majors in a career cluster area. For example, the state assessment for the Manufacturing Career Cluster area encompasses ten career majors, including welding, machine tool technician, and industrial electronics.

Unlike states that use NOCTI or other industry-developed exams, states creating their own, occupationally specific end-of-course or program exams are responsible for maintaining or expanding their CTE assessments. For example, during the 2004-05 program year, ***North Carolina*** reported validating and determining reliability levels for student assessment measures contained in 64 course blueprints, aligning 5 courses with national curricular standards, and developed 59 test item banks to assess local educators in developing assessments to prepare students for state exams.

While there is undoubtedly a substantial expense associated with instituting state-specific CTE assessments, state profiles suggest that administering statewide testing programs need not be prohibitively expensive. For example, ***Utah*** estimates that it is able to maintain its annual testing program for less than $400,000 a year, with districts providing roughly half of all resources. Federal Perkins funding is used to offset state level expenditures. State administrators in ***Kentucky*** report budgeting just $80,000 per year to maintain the assessment system, which

includes the cost of compensating occupational taskforce partners, producing assessments, scoring exams, and reporting performance results. Similarly, administrators in ***North Carolina*** report that the state spends about $100,000 annually on the testing effort, including development of test items, validation and reliability testing, creation of tests, development of manuals used in testing, and duplication.

State-Developed Assessments: Other State Testing Efforts

Among states employing end-of-program assessments, ***Oklahoma*** stands out as a leader in the competency testing arena. Since 1980, the Oklahoma Department of Career and Technology Education has worked to (1) identify skills standards that reflect the knowledge and abilities needed to perform jobs within an industry, (2) develop curriculum that helps students attain the content identified in the skills standards, and (3) create competency assessments that align with the skills standards taught using the curricular materials. To assess student performance, the state has developed more than 128 occupationally specific, end-of-program tests. These exams consist of a performance evaluation and written competency assessment. The state has also recognized over 200 alternative assessments, including industry certifications, licensure exams, and tests developed by NOCTI, Brainbench, and other agencies, that may be used in place of state-developed written competency assessments.

Ohio also maintains a sophisticated end-of-course and program assessment system to test student entry-level occupational knowledge. A total of 48 criterion-referenced occupational assessments have been developed, with each exam linked to an Occupational Competency Analysis Profile or Integrated Technical and Academic Competency list. End-of-program tests, consisting of roughly 100 multiple-choice questions, are typically administered to seniors during or after completing their last class in a CTE sequence. Modular tests consisting of 20 to 30 multiple-choice items associated with a single-unit instructional area, are designed for juniors or seniors following course completion. Generally, a program will consist of a sequence of 8 to 10 modules. Exams may be administered either on-line or using traditional paper and pencil approaches. Similarly, ***West Virginia*** provides for end-of-course technical skills tests to assess students' attainment on state content standards and objectives. The state currently provides for 117 exam areas.

The state of ***Mississippi*** assesses CTE skill attainment using the Mississippi Career Planning and Assessment system. Occupationally specific assessments are administered to all secondary students completing a CTE sequence. The state currently maintains 31 program area exams that are aligned with CTE curricula, and are revised on the same four-year cycle as the curriculum

they are designed to assess. Test item questions are administered as multiple-choice options, with students entering their answers on machine scannable forms. As of the 2005-06 school year, the state has discontinued use of ACT's Work Keys Workforce Readiness Assessment for CTE concentrators, primarily because local districts were not requesting it for their use.

In sum, states that develop occupationally specific, end-of-course or program exams face the prospect of creating and updating a multitude of assessments for different occupations, and in some cases multiple skill levels within a single occupation. Annual state investment following test development need not be prohibitively expensive, however, with some state maintaining testing services at a fraction of that spent in the academic arena. Moreover, since testing systems are owned by the state, the marginal cost of assessing students can fall with use.

Since assessments are usually tailored to address state CTE standards, it is unlikely that most occupationally specific assessments can readily transfer across states, although it is difficult to assess this without a more detailed comparative study of state systems. It is possible that state standards in some occupations may overlap, particularly if a set of nationally recognized standards exist and have been consulted in states' standards and assessment development process. Given the amount of work required to develop state standards and assessment systems, states would benefit from sharing their existing systems to avoid unnecessarily duplicating effort.

Strategy 3: State Developed Occupationally Generic, End-of-Program Exams

Wyoming monitors the skill attainment of CTE concentrators using the Wyoming Career Technical Assessment (WyCTA), an electronic, state-developed testing instrument that assess a broad set of work readiness skills common to all CTE programs (see Appendix E). Performance assessment areas contained within the WyCTA directly link to state content standards that were established based on recommendations contained in the 1991 report, *What Work Requires of Schools: A SCANS Report for American 2000*—published by the Secretary's Commission on Achieving Necessary Skills—and the National Career Development Guidelines, developed by the National Occupational Information Coordinating Committee (NOICC) in 1989.

Wyoming's CTE standards specify the general skills students are expected to master and perform. These standards are not intended to serve as either instructional curricula or technical documents to guide day-to-day instruction; rather, teachers are expected to consult the standards when developing curriculum. Standards are organized into six major strands:

1. Resources: Students manage time, money, materials, facilities and human resources.
2. Interpersonal Skills: Students acquire and demonstrate interpersonal skills necessary to be successful in the workplace.
3. Information: Students acquire and use workplace information.
4. Systems: Students demonstrate an understanding of how social, organizational and technological systems work.
5. Technology: Students demonstrate the ability to use a variety of workplace technologies.
6. Careers: Students develop skills in career planning and workplace readiness.

The WyCTA provides performance rubrics covering six content areas: Communication, Applied Math, Affective and Thinking, Technology, Pre-Employment, and Employability. These content areas align with the content strands, content standards, and benchmarks identified in the state standards. Each content area identifies a set of sub-skills that are used for actual rating purposes.

Unlike most state assessments, which combine a program specific set of multiple-choice questions with a performance assessment, the WyCTA is solely performance-based: students are rated based on their ability to demonstrate generic skills specified in a set of 18 scenarios. Students are rated on their performance by educational staff trained to serve as WyCTA evaluators. Whenever possible, CTE instructors are the first choice to serve as raters, since evaluators must be able to observe students over an extended period of time; however, academic instructors, guidance counselors, and other school staff may also serve as raters.

Evaluators are provided with a standardized set of rubrics, rubric instructions, and a set of sample prompts for each performance scenario. Evaluators use these rubrics to assign a rating to students on each WyCTA sub-skill area, based on observations that the evaluator makes in the classroom or other work situation throughout the academic year. In addition to rubrics and prompts, raters may consult student portfolios, projects, and other written assessments for use in triangulating ratings. Students have between one to two weeks to complete their assigned problem. All student ratings must be completed by April of the current school year.

Unlike other state assessment systems, the WyCTA provides educators with an extended opportunity to observe student performance on a task that requires a range of skills. For example, in one performance scenario, entitled “Cats and Dogs Everywhere!” students are asked to solve a problem involving a local kennel. As part of this one-week assessment, students must identify a problem, provide documentation for the solutions they propose, schedule at least two planning sessions that are observed by the project rater, demonstrate using a computer to access and use a word processing program, deliver a presentation to a class or small group, and demonstrate

listening skills by incorporating presentation feedback into a final written presentation of the report. Raters evaluate student performance using a set of performance rubrics that specify the sub-skills used in the problem, with outcomes rated using on a four-point scale.

Although the Wyoming assessment system relies on local educators to assess student skill attainment, the system is built around a sophisticated set of performance scenarios and assessment rubrics that are directly linked to state content standards. Unlike local assessments in other states, in which instructors subjectively assess whether students have attained skill proficiencies, Wyoming educators are trained in the use of standardized, objective measures of skill attainment. Although educators have some flexibility in administering tests (e.g., tailoring prompts to fit local conditions or determining timeline for performance), State commissioned studies indicate the test provides valid measures of student learning, with high levels of inter-rater reliability.

According to state administrators, the decision to adopt the WyCTA was conditioned on a number of considerations

1. *Annual Expense*—To avoid recurring costs associated with administering program specific, vendor developed assessments (e.g., WorkKeys), Wyoming established a single exam that could be conducted by districts without incurring annual charges.

2. *Instructional Time*—Rather than take time out of the instructional day to administer written tests, the state opted for a performance-based testing approach that could be incorporated into classroom activities. This provided an opportunity for students to learn from their experience, while demonstrating their skill mastery.

3. *Local Control*—Wyoming is a rural state with a tradition of local control over curriculum and assessment. Although the WyCTA prescribes a testing approach, local educators have some flexibility in how the test is administered and scored, reducing opposition to the exam.

4. *Authentic Assessment*—Given that SCANS focuses on student attainment of many affective skills (i.e., thinking and personal qualities, which include responsibility, sociability, self management), state administrators believed that a performance-based assessment would permit students to demonstrate these skills in a real world context.

Although Wyoming's performance-based assessment is intended to evaluate student attainment of broad, transferable work readiness skills in a cost-effective manner, it is difficult to quantify the actual expense associated with testing. Like most states, Wyoming has invested substantial resources to develop its testing instrument; however, the testing program has evolved over time, making it difficult to separate out initial development costs from those associated with the final assessment.

Although annual state expenditures for skill testing are limited to compiling and analyzing testing results, local educators invest a substantial amount of time administering, evaluating, and reporting test ratings. The cost of this instructional time, which may be spread over two or more weeks, is difficulty to quantify.

In sum, Wyoming has taken a unique approach to CTE skill assessment, one that balances state needs with federal reporting requirements. Use of a standardized, locally administer performance-based assessment, aligned to a state CTE standards, has enabled state administrators to assess student attainment of generic work readiness skills common to all programs. This has helped the state to contain assessment costs. Although the state CTE standards and assessments are tailored to state needs, Wyoming's assessment model could be readily transferred to other states. This would require, however, that states institute and administer a complex assessment system. Given the effort associated with rating individual student performance, the Wyoming approach may be more suited to states with smaller CTE student populations.

CONCLUSION

States are using a variety of approaches to assess secondary students' CTE skill attainment. Among states using some form of standardized skill assessment, roughly half are using vendor-developed occupationally specific tests, supplemented with state and industry credentialing exams. Remaining states conduct assessments using state developed exams, with most focusing on student attainment of occupationally specific skills. Irrespective of testing approach, in most cases CTE assessments align with both nationally defined occupational standards and state-established CTE performance standards.

State profiles indicate that states face both start-up and recurring costs in adopting CTE assessment systems. Unfortunately, state representatives were unable to fully quantify the cost of exam creation in the timeline adopted for this paper. Difficulties in quantifying costs are related to the extended time period over which assessments were developed, the number of occupational areas selected for assessment, the types of occupations selected, and the difficulty administrators have in estimating the cost task force members' time. It appears that, once developed, states are investing between $100,000 to $500,000 annually to maintain their assessment systems. Costs vary across states, however, as a function of testing approach, the number of CTE exams used to test students, and the number of students participating in exams.

In most instances, states are using their federal Perkins funding to maintain state testing systems. While local districts typically do not have to pay to participate in the assessment system, local educators are usually responsible for administering assessments and, in some states, scoring performance outcomes. This can require that staff receive specialized training and use instructional or other time to conduct assessments. Local educators may also incur some costs in duplicating test materials or in transmitting test documents to the state.

Due to study limitations, it was not possible to compare the relative cost of employing third-party assessment systems (i.e., national and industry developed exams) to the cost of using state-developed and administered approaches. While more detailed studies of state systems are warranted, it would appear, based on conversations with state administrators, that states using standardized, vendor- or industry-developed national exams may face somewhat lower start-up costs than states developing their own exams. Savings occur because state administrators do not need to convene task force members to create and validate CTE standards and assessments in each occupational area.

Although fiscal data were not available, it would be interesting to assess the marginal cost of testing students using third-party versus state-developed assessments. Since states contracting with outside vendors face a fixed assessment cost, it may be that state-developed assessments are less expensive to conduct in the long run, depending on the number of students tested, the lifespan of state exams, and other administrative and scoring factors. Indeed, ***Pennsylvania*** reports that it spent roughly $540,000 to maintain its statewide testing program in 2005, compared to only about $100,000 in ***North Carolina.***

This statistic takes on meaning when one considers that in the 2003-04 academic year (the most recent for which comparable Consolidated Annual Report data are available, ***Pennsylvania*** reported testing just 16,057 CTE students, compared to 269,147 end-of-course assessments administered in ***North Carolina.*** This suggests that the per-student cost of assessment in ***Pennsylvania*** is roughly $33.50, compared to just $0.37 in ***North Carolina***. While there are several problems associated with these calculations, a follow-up study to clarify the actual cost of assessment using different approaches could surface useful information to assist states in selecting a testing strategy.

Another set of questions relate to whether there are any educational advantages to using national versus state-developed assessments. Although conversations with state administrators suggest that states using vendor-developed exams are able to tailor assessments to align with state standards, whether this approach is as effective as developing state-specific assessments is unknown. Conversations with state employers and postsecondary educators could also shed light on whether national or state-developed exams confer any advantages over another, as well as whether CTE assessments in general, help to prepare students for employment or postsecondary advancement.

Finally, although most states have developed occupationally specific assessments, some states have opted for more generic assessments. For example, ***Kentucky*** has designed a system of assessments that are targeted at the career cluster level, and ***Wyoming*** at the general work-readiness level. Is one approach superior to another? Or is a combination of work readiness and occupationally specific exams desirable? Furthermore, how do states that use a written, multiple-choice exam compare to those that combine a written and performance component?

While it is beyond the scope of this paper to answer these and other questions, information contained within the state profiles section of this report can help states as they begin to prepare to adopt new CTE assessment systems called for in the upcoming Perkins reauthorization. Initial

findings from this paper also suggest that it may be worth developing a mechanism to allow states that have developed their own assessments to share these tests with other states. If states lacking CTE assessment systems are to develop their own state systems—and additional guidance may be warranted before states proceed in this direction—it may be more cost efficient for states to build off the products developed in other states, rather than attempting to design their assessments from the ground up.