Background Report on

Minnesota CTE Assessment Project

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Minnesota
STATE COLLEGES
& UNIVERSITIES

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SECTION 1. BACKGROUND

The Minnesota CTE Assessment Project

In 2009, the Minnesota State Colleges and Universities System (The System) and the Minnesota Department of Education (MDE) launched a collaborative pilot project focused on assessment of technical skills in Minnesota's Career and Technical Education (CTE) programs offered in colleges (including community colleges, technical colleges, and community and technical colleges) and high schools. The purpose of the project is to, between 2009 and 2013, develop an assessment system that will provide teachers, administrators and policymakers with accurate and useful information about student technical skill achievement. This assessment system will provide information that is useful for improving program quality, creating strong connections between high school and college programs, and communicating to employers and policymakers the value of career and technical skill programs of study in preparing students for college and work readiness. The pilot phase of the project will last through the end of 2009, and the next phase of development and roll-out will begin in 2010.

The Perkins Act and CTE Skills Assessment

In August 2006, Congress enacted the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Public Law 109-270). This is the newest version of a federal program that for decades has provided federal funding to support CTE programs in secondary schools and in certain college-level programs. These federal dollars provide a flexible source of funding for schools and community colleges to defray the costs of personnel, teacher training and equipment purchases relating to qualified career and technical education programs. In return for receipt of the funds, states, school districts and colleges must adhere to program requirements that are intended to improve the educational and workforce outcomes of students enrolled in these programs.

While many provisions from the previous version of the law remain, two important changes to the 2006 law are:

- provisions that create CTE programs of study that bridge between high schools and college-level programs; and
- a new approach to assessing CTE skills.

Working together, The System and MDE (State Partners) are implementing the provisions of Perkins 2006 addressing programs of study and technical skill attainment. These two provisions are being developed in a way that is complementary, simultaneously supporting the developing of Programs of Study (career pathways) and assessment mechanisms that will provide measures of student learning in these pathways at the secondary and postsecondary levels.

Minnesota's work on Programs of Study is premised on a core principle that all students need some preparation beyond high school, though that preparation could be at a 4-year university, a 2-year college, as well as through an industry certification program or advanced preparation through work.

While The System and MDE have defined Programs of Study (POS) as beginning no later than grade 11 and continuing for at least two years beyond high school, it should not necessarily be presumed that every POS must include collegiate work.

To help develop and implement POS extensively, The System and MDE have supported the formation of 26 formal consortia of secondary and postsecondary partners established to receive funds and jointly administer and support CTE programs. To support cross-system collaboration, about 20 percent of local funds are allocated to develop and improve the consortium structure.

SECTION 2. PILOT PHASE, MARCH THROUGH DECEMBER 2009

To meet the new requirements, leaders from the System and MDE decided to create a pilot phase to begin work on the assessment system. Ultimately, this pilot phase process will be replicated for each of the state's career pathways.

Developing common expectations for Technical Skill Assessment

Prior to the beginning of this project in early 2009, the System and MDE had not established any statewide expectations of what knowledge, skills and attributes were to be taught in various CTE programs. The State Partners team, comprised of representatives from The System and MDE, determined that before any work could commence on development or identification of technical skills assessments (TSAs), the State Partners would lead a process of identifying measurable CTE competencies that are (or should be) present in each of the CTE Programs of Study. In Minnesota, POS are defined as sets of aligned programs and curricula that begin at the high school level and continue through college and university certificate, diploma and degree programs.

The purpose of this effort is to identify the Common Core Competencies for each program, competencies that are shared as a minimum among all programs within a particular career pathway. After the POS is adopted and the competencies are identified for each pathway, the State will guide a process to determine the best means of assessing those competencies among students.

Assessments of Competencies within Career Pathways

Minnesota has adopted, with some modifications, the national definitions for career clusters, career pathways and programs of study. The following definitions are used:

Career Fields: the organizing structure for the 16 career clusters and 81 pathways. The six career fields represent the broadest aggregation of careers. Students are normally exposed to career field exploration in middle school and early high school.

Career Clusters: grouping of occupations and broad industries into a national classification of 16 clusters which are based upon common knowledge and skills. Career clusters include hundreds of occupations which are grouped into pathways around which educational programs of study can be built.

Career Pathways: represent an organization of related occupational areas within a specific career cluster. Each of these pathways has identified essential industry validated knowledge and skills which provide foundational information for development and revision of CTE programs and Programs of Study that span between secondary and postsecondary education. Once programs of study are developed, learners at various levels (high school, college, university or at the workforce training level) will then be able to choose from several individual programs within a Program of Study in order to attain the specific knowledge, skills and abilities and pursue a career of their choice.

Programs of Study: sets of aligned programs and curricula that begin at the high school level and continue through college and university certificate, diploma and degree programs and prepare students for careers and occupations that allows for multiple student entry and exit points.

CTE Programs: CTE Programs are coherent sequences of courses that reside within high schools or colleges. A CTE Program at the secondary or postsecondary level may contribute to a Program of Study, as defined above, but they are not one and the same.

Minnesota's CTE programs are currently organized under the structure of six career fields, 16 career clusters, and 81 pathways.

Career Field	**Clusters and Number of Pathways**
Agriculture, Food, and Natural Resources	• Agriculture, Food, and Natural Resources (7 pathways)
Arts, Communications, and Information Systems	• Arts, Audio/Video Technology, and Communications (6 pathways) • Information Technology (4 pathways)
Business, Management, and Administration	• Marketing, Sales, and Service (7 pathways) • Business, Management, and Administration (6 pathways) • Hospitality and Tourism (4 pathways) • Finance (4 pathways)
Engineering, Manufacturing and Technology).	• Transportation, Distribution, and Logistics (7 pathways) • Architecture and Construction (3 pathways) • Manufacturing (6 pathways) • Science, Technology, Engineering, and Mathematics (2 pathways)
Health Science Technology	• Health Science (5 pathways)
Human Services	• Law, Public Safety, Corrections, and Security (5 pathways) • Government and Public Administration (7 pathways) • Human Services (5 pathways) • Education and Training (3 pathways)

To begin the process, the State Partners selected a number of potential CTE pathways for the pilot phase by reviewing enrollments for CTE programs at the secondary and postsecondary levels, and also applying criteria for high wage, high skill and high demand career fields. When the initial pathways were selected, the partners invited the 26 regional consortia to nominate teachers and faculty members to participate in the pilot phase of the project.

The following career pathways were identified for initial development under this project.

- Business, Financial Management and Accounting (part of the Business, Management and Administration Cluster)
- Health Therapeutic Services (part of the Health Science Cluster)
- Law Enforcement (part of the Law & Public Safety Cluster)
- Network Systems (part of the Information Technology Cluster)
- Plant Systems (part of the Agriculture, Food and Natural Resources Cluster)

The first five Career Pathway Work Groups were convened in March and April 2009, with follow-up meetings in May and June. As the Pathway-specific teams were convened, they were asked to address:

- For each identified Career Pathway, what limited number of "Common Core Competencies" – those key competencies that are essential among all programs at either the secondary or postsecondary levels and should be assessed? The Common Core Competencies would be derived from a set of national model standards that have been compiled by the States Career Clusters Initiative and other organizations.

- For each Pathway, are there existing assessments that are appropriate and affordable, or should new assessments or assessment methods be developed?

- How should the "Assessment Blueprint" (see definition below) for each of the five initial career pathways be formulated?

- What are recommendations for how the State should proceed in developing an assessment system?

The Assessment Blueprint

An **"assessment blueprint"** is a document that indicates the broad categories of knowledge and skills that will be covered in an assessment instrument and the percentage of the assessment that will be devoted to each area of knowledge and skills. The assessment blueprint may also include guiding information about the proposed length of assessment, the number of assessment items and the types of assessment approaches (e.g. multiple choice, constructed response, multi-step problems, performance tasks) that should be used; however, an assessment blueprint does not include actual sample test questions. In the context of this specific project, the Minnesota assessment blueprints will be used to review the appropriateness of existing assessments by determining how closely those assessments match up to what the Career Pathway teams have determined should be assessed. The assessment blueprints can also be used to guide the development of new assessments where suitable third-party assessments do not exist.

Next Steps in the Pilot Phase – Project Transition

A number of subsequent activities are necessary to fully implement an assessment system for the five pathways selected for the pilot phase. At this stage of the project, the Consultant Team has completed its designated responsibilities for identifying the Common Core competencies, developing the respective Blueprints, and designing the overall implementation plan for the project.

At this point, leadership for each of the five pilot career pathways will be transitioned to staff member(s) from The System and MDE. The staff members could co-facilitate by serving the role of conduit between the working groups and the state as well as by leading and coordinating the next stage of activities. It could also be possible for one of the regional Consortia that are already involved in a particular pathway to be selected to play a role as the Lead Consortium for each of these pathways, and working in coordination with The System and MDE, take the lead for implementing the next steps.

1. Expand Review and Input for Pathway Competencies

1a. Teacher/Faculty Input

In October 2009, the Consultant Team formatted the Common Core Competencies for online review and comment using the Zoomerang online survey instrument. The State Partners sent email notifications for CTE Consortium Directors, CTE coordinators and deans of instruction throughout the state informing them about the survey, and invited them to forward links to each of the Competency Surveys to relevant teachers and faculty. Comments from the online review were incorporated into the Common Core Competencies, reviewed with the teacher/faculty groups, and finalized for the next phase of review.

1b. Business and Industry Review

For each of the Pathway Common Core Competencies, the team leader (working with Subject Matter Experts [SMEs] from the Career Pathway team) should identify and invite representatives from business and industry to participate in a review session to discuss the CTE assessment system, and review the proposed pathway competencies. While an online review of the competencies is possible, the length and detail of the competences document may be too daunting and could be off-putting to a typical industry partner. Rather, a facilitated three to four-hour session should be sufficient for the business and industry review panel to review the proposed Common Core Competencies. Copies of the competencies should be mailed in advance of the meeting. There are three levels of performance described in the Core Competencies, Performance Elements, Performance Indicators, and Performance Measures (the most detailed level of description). To keep the meeting from being bogged down, the facilitated discussion with business and industry partners should mostly focus on reviewing the Performance Indicator descriptors.

2. Review assessment inventory

Working from several state and national sources and the state online survey results, the Consultant Team has created an inventory of third-party assessments that should be considered for use in the

Minnesota assessment system. The Assessment Inventory is organized by use in secondary or postsecondary, and also indicates other assessments like competitions hosted by Career Technical Student Organizations. The Assessment Inventory also indicates if an assessment was recommended by the 2009 assessment review conducted by the Southern Regional Education Board, a review which looked at several hundred nationally available technical skill assessments.

3. Conduct Review of Selected Assessments
See the description for this process under the "Implementation Process".

4. Determine if there is a need for Minnesota-developed assessments
See the description for this process under the "Implementation Process".

5. Develop assessments (if needed)
See the description for this process under the "Implementation Process".

6. Develop and post master list of approved assessments
See the description for this process under the "Implementation Process".

7. Gather teacher ratings of assessments
See the description for this process under the "Implementation Process".

8. Conduct outreach to business and other stakeholders

In November 2009, the State Partners will identify other interested stakeholders, such as the Governor's Workforce Council, state legislative committees, federal Representatives and Senators from Minnesota, and state business oversight groups. The State Partners will request meetings, through the appropriate processes in their respective agencies, to provide briefings on the CTE assessment process.

SECTION 3. IMPLEMENTATION PROCESS FOR REMAINING PATHWAYS, 2010-2014

The following section outlines the process that will be followed to replicate the Pilot Phase for each of the remaining pathways.

1. Prioritize Career Pathways

In early 2010, the State Partners will determine their preferred sequence of review for the possible remaining career pathways, based on the number of students enrolled in secondary and postsecondary programs, the number of programs, and the programs of study existing in the state. Currently, there are programs of study approved in 38 pathways in Minnesota.

The State Partners will determine the number of career pathways to be reviewed in each year, starting with approximately 6 pathways for development for school year 2010-2011.and the remaining pathways to be completed by school year 2013-14.

2. Establish Career Pathway SME Teams

For each Pathway Team, the State Partners will select a Lead Consortium to coordinate and implement the next steps. The State Partners will work with lead consortia to identify a Pathway Subject Matter Expert (SME) Team working group for each of the pathways in development. The State Partners will also designate a staff member from The System and MDE to serve as the primary point of contact between the State and each Pathway Team.

For the initial review process, the State Partners will provide support to Consortia that lead the assessment development process. The consortium may pay a stipend to the team leader to cover his/her time for leading the effort, and may also use funds to pay for food and travel expenses among team members. Each consortium that receives support must complete all steps in the implementation process, except for actual development of a new assessment. The assessment development process will be covered through a separate effort.

2a. Pathway SME team composition

For each proposed pathway, the applying Consortium will identify at least five teacher/faculty/industry personnel to serve on the Pathway Subject Matter Expert (SME) teams. The size of the SME team is not explicitly limited, but the level of state support will not be increased to accommodate a larger team.

The lead consortium must include teachers and faculty from at least two other consortia on its SME team. If this requirement is not met, the development project cannot proceed.

2b. Selection of lead consortia

The State Partners will solicit interest and select the Lead Consortium for each career pathway. An eligible Consortium may apply to lead the development process for one or more Career Pathways.

Each Lead Consortium will identify a team leader for each pathway. Preferably, the team leader WILL NOT also be acting as a subject matter expert for the team, because that would compromise his/her role as a non-biased facilitator. The team leader should demonstrate a strong understanding of career and technical education, the role of content standards and assessments, and be an experienced facilitator with the ability to develop non-biased consensus among team members. Participants from the original five pathways may be ideal team leaders since they have already gone through the development process.

The State Partners will provide orientation/training for the SME team leaders. If possible, at the first SME team to be convened, other selected team leaders will attend to observe the process with another SME team prior to leading their own team.

3. Review, adapt and rank model competencies

The core effort for the Pathway SME Teams is to review, adapt, and rank model pathway competencies for their respective pathways. The steps in this process are as follows:

a. The Lead Consortium will be responsible for gathering and formatting model pathway competencies from CareerClusers.org, national organizations and other states. These materials should be organized in a common format for use by the Minnesota Pathway SME Teams.

b. The Lead Consortium will provide orientation sessions (by web-meeting using Web-Ex, GoToMeeting, Interactive Television (ITV) or a similar tool) for the Pathway SME Teams.

c. The Lead Consortium will send materials in advance for review by Pathway SME Team members.

d. The Pathway SME Teams will be convened for a face-to-face meeting with options for participation via internet conferencing service (such as WebEx or GoToMeeting) or ITV as appropriate, to review, adapt, and rank the Cluster/Pathway competencies. Approximately six to 10 hours is necessary for the initial review and ranking of items. Ideally, the meeting will run in person for one full day, and be followed-up by the three hour session, either in-person or by web-meeting.

e. The Pathway SME Teams will create an assessment blueprint, which assigns the relative amount of an assessment that should focus on key groupings of competencies at the secondary and postsecondary levels.

f. The Pathway SME Teams will be reconvened (by conference call or in person) to finalize the first-draft Core Competencies and Assessment Blueprint.

4. Expand review and input for pathway competencies

Following the Pathway SME Team working sessions, the Lead Consortium will format the draft Common Core competencies/Blueprints for review by other teachers, faculty members, and business and industry representatives. Once input is received, the Lead Consortium should revise as necessary, review the changes with the Pathway SME Team, and finalize the documents.

a. Teacher/faculty input

For each of the Pathways under development, the Lead Consortium should distribute the draft Common Core Competencies document and Blueprint for review and input by teachers and faculty state-wide. For the Pilot Phase, the Consultant Team formatted the draft Common Core Competencies for online review and comment using the Zoomerang online survey instrument.

b. Business and industry review

For each of the Pathways under development, the Lead Consortium (working with the Pathway SME Team) should identify and invite representatives from business and industry throughout the state to participate in a review session to discuss the CTE assessment system, and review the proposed pathway Common Core competencies. A three to four-hour session should be sufficient for the business and industry review panel to review the proposed Common Core Competencies.

5. Consult with other states

In October and December 2009, the State Partners convened two conference call meetings with CTE directors from Iowa and Wisconsin to discuss how each state is handling assessment and fulfilling the requirements of the Perkins Act. North Dakota and South Dakota were also invited, but were unable to participate.

Based on the discussion, it appears that Minnesota's efforts to identify and align secondary and post-secondary Common Core competencies with the goal of identifying valid and reliable technical skills assessments are in line with other states in the region.

Minnesota will want its efforts to be informed by the work of key surrounding states, specifically Iowa, North Dakota, South Dakota, and Wisconsin. The CTE directors participating on the call expressed a general interest in working collaboratively. The System and MDE should set up follow up conference calls with their CTE counterparts in the five-state region to discuss each state's work around TSA.

A number of states that are VTECS members, such as Arizona, Kentucky, Maine, and Wyoming are actively working on their assessment systems, following roughly the same process that Minnesota is using.

The State Partners will organize periodic calls to touch base with other states to collaborate on the assessment development process, working closely with VTECS on the project. The State Partners will also monitor developments through ongoing contact through the National Association of State Directors of Career and Technical Education Consortium (NASDCTEc), and the U.S. Department of Education Office of Vocational and Adult Education Next Steps Work Group.

6. Develop and review assessment inventory

The Pathway SME team will create an assessment inventory for each Pathway that includes the relevant "third-party" assessments that are used for education programs within a particular career field. Sources of information for this inventory may include: lists gathered from other states, the previously conducted survey of Minnesota teachers and faculty, and additional input from teachers/faculty and the State Partners.

Once the inventory has been created, the Pathway SME team will:

- Organize the assessment Inventory by use in secondary or postsecondary, and also indicate other assessments like competitions hosted by Career Technical Student Organizations.
- Indicate if an assessment was recommended by the 2009 assessment review conducted by the Southern Regional Education Board, a review which looked at several hundred nationally available technical skill assessments.

- Review whether assessments are used for professional certification and are administered outside the school environment, or whether they can be administered within the school environment.

- Review the cost of the assessment and determine whether it is feasible for use as an educational assessment to be paid by the school or college.

- Conduct a cursory review of available assessments to determine which ones should be subject to further review. This cursory review will involve gathering available "Blueprints" that describe the competencies that are covered in the third-party assessment, then determining how much overlap there is between the content covered by assessment and the Common Core Competencies for that pathway.

7. Conduct in-depth review of selected assessments

Working from the assessment inventory, the next step is to develop and apply criteria for approving assessments. The State Partners need to gather additional information on available assessments and, to the extent possible, compare them against the Pathway Assessment Blueprint. In addition, documentation of assessment reliability and validity should be requested from test publishers and reviewed by staff from The System and MDE to make sure it addresses criteria for validity and reliability covered in this report. The State Partners will not independently verify the validity and reliability of the assessment, but will require that documentation of validity and reliability be obtained from the test publisher. Assessment Blueprints are available for all NOCTI and SkillsUSA assessments.

Given the extensive work of the SREB in this regard, it probably makes sense to refer to the recommendations of the SREB in determining which assessments may be good candidates for use. During its review, staff from the SREB indicated that in some cases it is very difficult or impossible to get direct access to an exam from an assessment developer. In this case, other approaches will be necessary to gain more direct information about an assessment.

This could include:

- Asking a number of teachers take assessments that appear to be well aligned with program content standards to determine the ease or difficultly, the relevance to the taught course content, and the usefulness of the assessment results to the instructor.

- As appropriate, having groups of students take selected assessments on a pilot basis to determine the ease or difficultly, the relevance to the taught course content, and the usefulness of the assessment results to the instructor.

After information has been gathered, and individual teachers have reviewed documentation, taken the assessments, or had students take the assessments, the teacher groups should be reconvened to discuss the assessments and determine appropriateness of use for career pathways.

Upon conclusion of the review process, the Pathway SME team will determine which, if any, assessments should be designated as usable by schools and colleges for the purpose of assessment under the Perkins Act.

8. Determine if there is a need for Minnesota-developed assessments

Each Pathway SME Team will make a recommendation to the State Partners as to whether new assessments should be developed relating to a pathway, for each secondary and/or postsecondary use. The existence of third-party assessments does not preclude the SME team from recommending that a new MN assessment be developed, particularly if the SME team believes that the cost of purchase is prohibitive, the assessment is not sufficiently aligned with Minnesota's Common Core competencies, or the data from the third-party assessment is not sufficiently accessible or detailed to be of use for educational and accountability purposes.

9. Development of assessments (if necessary)

The State Partners may determine to develop an assessment specifically for use in Minnesota, or may share the development costs and process with other states.

Three options are available for assessment development:

1. Contract with NOCTI to create a "light" version of one of its existing assessments.

In this approach, NOCTI would customize one of its existing assessments based on the blueprint developed by Minnesota. NOCTI and the state SME team would meet together, review test items from the current NOCTI test, and select test items for the modified assessment. This would cost approximately $5,000 per assessment. Additionally, there would be a typical per-assessment administration cost for NOCTI, typically between $20 and $40 per assessment. All these modified assessments would be delivered in the on-line format, and a live performance-based component would not be available.

2. Contract with VTECS, NOCTI or another consultant for development of a new assessment.

VTECS and NOCTI have banks of test items available that are already aligned with specific competencies. The organization would be selected, and the SME team would be convened to review the test items available from the contractor, as well as non-copyrighted test items that are used or developed by teachers and faculty in Minnesota. Depending on Minnesota's relationship with other states that are developing assessments, additional test items could be gathered for review by the SME teams.

According to VTECS, several SME teams could be working on assessments simultaneously, all using the guidance and coaching provided by the consulting team.

Upon conclusion of the one-day SME session, the contractor would gather the test items and construct two different beta versions of the assessment, using a mix of different test items aligned with the identified competencies.

Teachers and faculty on the SME teams would be selected to administer beta versions of the test in a paper/pencil format. The Contractor would review results from the various test sites and determine whether individual test items are valid, and if the entire assessment meets criteria for validity and reliability.

9a. Determine use of online or paper-based administration

According to preliminary discussions with VTECS, TFI (The Technology fluency Institute, http://www.techfluency.org/index.php) is a subsidiary of Pittsco, and has established an online testing and reporting capability specifically for use by CTE programs. The system is designed to administer state-developed assessments for approximately $4-5 per administration. The $5,000 cost of test development through VTECS and $5 administration cost compares quite favorably with the $5,000 customization and $20-40 administration cost offered by NOCTI.

Arizona's Department of Education has been told that it must develop its own online testing capability, and will no longer be utilizing the services of TFI once its own system is up and running.

At this point, the State Partners have not determined which approach makes more sense -- outsourcing this function or developing a Minnesota-customized system. If the development costs through an IT consultant were $50,000 and the state charged local districts $5 per administration, the system would break even at the 10,000 test mark. This, of course, assumes that oversight and administration of the system would be handled by internal staff. If a contractor was kept on an annual retainer of $15,000, those costs would also need to be covered by the usage fee. In addition to the usage rate to reach breakeven, 3,000 administrations per year would be required to cover the cost of the contractor retainer.

9b. Pilot test a development process for state-developed assessments (if any are necessary)

Working with VTECS and other states that have developed assessments, beginning in fall and winter of 2009, Minnesota can begin implementing an assessment development process. Faculty/teacher working groups will need to be convened to identify sample test items for each competency, working from the assessment blueprints that have already been developed. The state may choose to procure services from an assessment expert to supervise or advise the process of assembling versions of a test, pilot test them with a small number of teachers and students, then run test item analyses to determine validity and reliability. Working from the results of the pilot round of tests, a valid and reliable test instrument can be developed for each respective pathway.

10. Develop and post master list of approved assessments

Minnesota will create a list of assessments that have been approved as to meeting basic requirements for validity and reliability, and also for the degree to which they align with the pathway common core competencies.

Any assessment on this list of assessments can be used as an approved assessment for the purpose of the Perkins Act accountability.

Colleges and districts will also be allowed to select other assessments, but they will have to provide a written justification explaining how it meets the standards of validity and reliability that are referenced in this manual.

When the state announces a new set of approved assessments for a career pathway, during the next complete school year, the college or district will be required to utilize a valid and reliable assessment and administer the assessment to its concentrators or completers, for whichever student the assessment is appropriate.

On The System CTE website, the State Partners will maintain a master chart and downloadable document that lists all the assessments that are available for use. The chart should list all career pathways, and indicate the status of the assessment project for each pathway and the expected review period for each pathway.

11. Gather teacher ratings of assessments

As assessments are selected and implemented, the State Partners will develop a ratings matrix that teachers can use to provide an informal evaluation of each assessment, similar to the kind of users ratings commonly found on e-commerce sites like Amazon.com. The rating items could be:

- Level of difficulty (ranging from far too difficult to far too easy)
- Alignment to program competencies (ranging from very well aligned to very poorly aligned)
- Length of time (ranging from 30 minutes or less TO four hours or more)
- Ease of Administration (ranging from very clear and simple use TO very complicated to use)

12. Conduct outreach to business and other stakeholders

In order for the CTE Assessment system to have value beyond meeting the requirements for Perkins accountability, a sustained outreach to employers should be conducted. It would be ideal if Minnesota's employer community would understand technical skill assessment, and recognize certifications in their hiring decisions.

The State Partners will identify other interested stakeholders, such as the Governor's Workforce Development Council, state legislative committees, federal representatives and Senators from

Minnesota, and state business oversight groups. The State partners will request meetings, through the appropriate processes in their respective agencies, to provide briefings on the CTE assessment process.

Section 4. STATE AND LOCAL IMPLEMENTATION ISSUES

4A. State Implementation Issues

4A-1 Issue: Determining eligible assessments

Expectation

Through the CTE Assessment Project, led in large part by teachers and faculty members, The System and MDE will recognize a large number of assessments that are approved for use by local districts and colleges for assessment in specific CTE programs. In essence, these assessments are pre-approved. However, if a school or college wants to use an assessment that is not on the approved list, it will need to provide information to the State Partners about the assessment, its alignment to the Common Core Competencies, and the ways in which the assessment demonstrates validity and reliability.

Discussion

In its receipt of federal Perkins funds, The System on behalf of all Minnesota CTE, is responsible to assure that assessments used for CTE programs within the state are "valid and reliable," measure the attainment of career and technical skills and are appropriate to a particular CTE program. Through the Implementation Process identified in this paper, teachers and faculty members across the state will have a role in identifying Common Core Competencies for each CTE pathway, as well as designating CTE assessments that are aligned with the competencies and also meet the state's working definition of "valid and reliable." While there is no federal definition of "valid and reliable," there is a commonly held understanding of the terms in the assessment and testing community, and those definitions are explained in the appendix to this report. Schools and colleges that choose to develop their own assessment or use another assessment will need to describe, to the satisfaction of the System and MDE, how these assessments fulfill the criteria described in the appendix.

4A-2 Issue: Determining how many CTE programs should be covered by assessments

Expectation

Over time, the goal of the Minnesota CTE is that all students reaching Concentrator status at the secondary level and the postsecondary level will be assessed with an approved assessment instrument that is considered appropriate for assessment of that program.

Discussion:

Under the Perkins Act of 2006, schools and colleges need to generate data on the percentage of CTE students who have reached a "Concentrator" status. Prior to the 2006 Perkins Act, some states had implemented the use of Industry-based credentials, but reserved their use for students that were performing at a high level of achievement. In cases where an industry certification had to be taken at a testing center and for a fee, teachers and faculty would either encourage or discourage students from taking the assessment, depending on how well the student had performed in the class and if the student had a very specific career aspiration that related to the certification. In this case, the certification added a certain prestige to the CTE program, but the certification was not an essential part of the program.

Under the Perkins Act, this dynamic is beginning to change. For a program improvement and accountability perspective, assessment is only useful if most or all students participate in the assessment. It is essential to identify how a broad cross-section of students were performing, not just the higher performers who were selected to take a test. For this reason, the intent of the State Partners is to identify assessment mechanisms for each CTE Pathway that are aligned with the Common Core Competencies, and phase in use of these assessments over a four-year period. The State Partners may make exceptions to this direction if they believe there are some programs with such small numbers of enrollment that development is not cost-effective.

4A-3 Issue: Defining "technical skills" for purpose of assessment

Expectation

For secondary CTE programs, assessments will primarily focus on knowledge and skills that fall within the domain of career pathways, with some emphasis on knowledge and skills that span across an entire career cluster or to work readiness generally.

For postsecondary CTE programs, it is more likely that assessments will focus on knowledge and skills that are specific to an occupation, as well as skills specific to a career pathway and career clusters.

To meet the requirement of the Perkins Act, the selected assessments must focus at a minimum on "technical skills" that are related to the career path or occupational area of focus.

However, given that Minnesota has adopted the Career Fields/Clusters/Pathways model with a core of Academic and Technical Literacy, it is appropriate for technical assessments to also measure student knowledge and skills in other domains.

However, assessments that only measure applied academic skills or employability/leadership skills may not serve as a proxy for an assessment of specific knowledge and skills found within a career pathway.

Discussion

In considering the framework for the MN CTE Assessment System, there are several areas of skills that could fall under the broad term "technical skills." There is not a federal definition of the term, but the Perkins Act does provide related definitions.

For example, the definition of career and technical education, is

> ''(5) CAREER AND TECHNICAL EDUCATION.—*The term 'career and technical education' means organized educational activities that—*
> *''(A) offer a sequence of courses that—*
> *''(i) provides individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions;*
>
> *''(ii) provides technical skill proficiency, an industry-recognized credential, a certificate, or an associate degree; and*
>
> *subparagraph; and*
> *''(B) include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual.*

Based on these definitions, CTE can include content that is aligned with academic standards, technical knowledge and skills, as well as broader skills such as higher-order reasoning and problem-solving skills, work attitudes, general employability skills, all aspects of industry, and entrepreneurship.

Reflecting on the legislative history of the Perkins Act during the 1980s and 1990s, Congress consistently inserted definitions and processes that were intended to broaden the scope of CTE, so that it helped develop a broad array of skills, not just a narrow set of job-specific skills. But in the 2006 legislation, there was a clear reference to skills and knowledge recognized by industry and industry certifications.

Minnesota has adopted the model of **Career Fields/Clusters/Pathways** that describes how each CTE program of study is built upon a foundation of Academic and Technical Literacy that includes knowledge and skills in the following domains:

- Employability
- Ethics
- Systems
- Teamwork
- Problem Solving

- Critical Thinking
- Information Technology Application
- Legal Responsibilities
- Community
- Safety, Health and Environment
- Social Studies
- Math
- Science
- English
- Personal Finance

4A-5 Issue: Establishing pass rates and scoring terminology for various assessments

Expectation

For both secondary and postsecondary purposes, all scores for assessments will be reported as either "Proficient" or "Below Proficient."

For the purposes of Perkins accountability, only the first administration of an assessment will be counted.

Discussion

The Perkins Accountability plan for technical skill attainment will report the percentage of test takers that "pass" the exam. For industry-based certifications or state licensing exams, the pass score will be set by the sponsoring organization. For other association-developed assessments and state-developed assessments, the State may need to lead a process to determine what scores count as "passing" for the purpose of Perkins accountability.

One issue of concern is that some industry certifications have a very low pass-rate for first-time test takers. This low pass rate should be taken into consideration as to whether the assessment/certification is actually appropriate for the level at which it is administered. But even if students are allowed to take additional administrations of an assessment, particularly in order to earn an industry certification, for the purpose of administrative simplicity, only the first administration of the assessment will be reported to the Perkins accountability system. The State Partners determine that reporting on first-time test takers is preferable because it will provide the most accurate snapshot of a program's performance. However, the State Partners recognize that, in some cases, the only available data source may mix first-time test takers with repeat test takers.

Additionally, the State Partners have considered the possibility of using additional levels of achievement such as advanced, proficient, basic, and approaching basic. Similar terminology is used in reporting on student academic achievement. Given the dozens of different tests/assessments that will be in play with the CTE Assessment System, for state and national reporting, it will be simpler to use two designations of Proficient and Below Proficient.

However, the State Partners expect teachers and faculty members to review the tests in greater detail and identify the range of performance among students, particularly in how students achieved in various competencies. This type of analysis is critical for teachers to make meaningful decisions about curriculum and instruction.

4B. Local Implementation Issues

4B-1 Issue: Local responsibility for technical skill assessment

Expectation

As a condition for receipt of local allocations of Perkins Act funding, all school districts and colleges accepting Perkins funds must adopt, over time, assessments of CTE skills and knowledge for all CTE concentrators, and these assessments must meet criteria established by The System and MDE.

Discussion

In designing the MN CTE Assessment System, a major consideration is the degree to which state government exerts control over college and K-12 curriculum and operations. While some states have strong centralized control over education, many states including Minnesota carry on a strong tradition of local determination by school systems and colleges.

Receipt of federal government Perkins funding by both the state government and local institutions is essentially a contractual relationship. As a contractual relationship, the U.S. Congressional Budget Office has indicated that most federal education funds are not considered "unfunded mandates." Theoretically, if the requirements for accepting the federal funds become too onerous, a state could decline participation. The same holds true for local school districts and colleges. They are not necessarily obligated to receive Perkins funds, and if any requirements, such as technical skill assessment, were deemed too onerous it is conceivable that some colleges and districts might decline to apply for Perkins funding.

The State Partners are involving CTE teachers, faculty and administrators at every stage of development, so that there is a high level of contribution to and ownership of the CTE Assessment System. But ultimately, local school districts and colleges will need to participate in the CTE Assessment System as a condition for receiving their federal Perkins allocations.

As part of this discussion about local responsibilities, the State Partners will continue to consider the relationship between 1) local control of curriculum and teacher and faculty responsibilities for assessment and 2) local and statewide responsibilities for accountability and meeting federal requirements (including the Perkins Act) for technical skill attainment. High school teachers, college faculty and business and industry representatives must be involved in the process for determining common core outcomes for career pathways and recommended technical assessment instruments and measures. Ultimately, performance on technical skill assessment must be reported at the state

level for federal and state requirements—it is the responsibility of the System and MDE to report performance and meet performance targets.

4B-2 Issue: Determining what CTE students should be assessed

Expectation

Among CTE students, only those students that have reached the "concentrator" status will be assessed.

Discussion

The Perkins Act indicates that the state must establish performance measures that apply to "CTE Students" but the law itself does not directly define a CTE student. Presumably, a CTE student is an individual that participates in Career and Technical Education. Career and Technical Education is defined as "organized education activities that…offer a sequence of courses…"

Based on the indication that CTE is a sequence of courses, the U.S. Department of Education has provided guidance that creates a distinction between a CTE "Participant" and a "Concentrator." With this distinction, a Participant is an individual that may take just one or two unrelated CTE courses, whereas a CTE Concentrator is an individual that has made more of an investment in learning about a particular career field. The federal guidance indicates that, for most measures, schools and colleges are accountable for the performance of CTE Concentrators, but not for Participants.

In the Minnesota State Plan, postsecondary concentrator status is defined as a student earning 12 credits. While concentrators will be assessed, the assessment does not need to be given immediately upon reaching this status. Timing of assessment is addressed in the next section.

4B-3 Issue: Determining timing for assessment

Expectation

For secondary CTE students, the CTE assessment, linked to the Common Core Competencies, will be administered at the end of the school year in which the student reaches the Concentrator status. On a program by program basis, the time of administration may be modified if there are eligibility factors (such as age or work experience), or other factors to be considered.

For postsecondary students, the time of administration will be made on a program by program basis. If a capstone or industry certification is appropriate, then administration of an assessment is likely to be at the end or shortly after the end of a program. But at the

discretion of the individual program, the assessment may be offered as soon as the student has reached a Concentrator status.

Discussion

A key decision point is determining at what point to assess the student's knowledge and skills. The Perkins Act itself does not provide guidance on this point, only that the accountability measure must be applied to "CTE Students."

For secondary Concentrators, one approach would be to assess all students on a course-by-course basis, and then only report the assessment scores for students that reach the Concentrator status. Or the simpler approach would be to just offer the TSA after the second in a sequence of courses, as an end-of-program assessment. Since the assessment would be offered after the second course in a sequence, only Concentrators would be likely to take the assessment.

One challenge to this notion, however, is that there is no standardization of course sequences across the state. It would ultimately be up to the local school district to determine when a student should take a particular assessment, and to report achievement data on that student once he or she has reached Concentrator status.

For CTE postsecondary Concentrators, the student typically will accumulate a total of 12 credits (general education and CTE-specific) in a Perkins-eligible program to be considered a Concentrator, although the System recognizes that many of these 12 credits may be general education credits, not technically specific credits. Therefore, the most appropriate time for assessment might not be immediately upon achievement of concentrator status. The TSA could be offered either at the point when the postsecondary student has acquired enough technically-specific knowledge and skills to make assessment appropriate, or at the conclusion of a program (through an end-of-program assessment or an industry-based certification test). The State Partners will give further consideration to this issue and, as assessments are implemented, work with colleges to determine the most appropriate timing for assessment.

4B-4 Issue: Access to data from third-party assessments

Expectation

To utilize a third-party assessment for the purposes of receiving Perkins funding, each school or college must have in place procedures to ensure that data on student performance from that assessment is accurate. These procedures for gathering and reporting data will be included in the consortium's annual update to its local plan, as new assessments are brought online. To the maximum extent possible, the school or college must arrange to have student performance data provided directly to the individual responsible for inputting student achievement data. Where possible, the program will provide for data release authorizations,

signed by the student, that will allow the test administrator to provide student performance data to the school or college.

Where possible, The System and MDE will consult with national testing organizations and work to develop protocol so that student assessment data is directly inputted in state data systems for Perkins accountability. However, in absences of state agreements, the responsibility for data quality continues to reside with the local district or college.

Discussion

One of the biggest challenges states are facing relating to assessment is getting access to data from third-party assessments. In recent tradition, within a CTE program, only the higher performing students or those who specifically need a certification for entry into a career field might actually take an available industry certification test. Usually the student pays the cost for the certification, and on a contractual basis, the test results belong to the student and are not accessible to the school.

One approach that has been suggested is for the test taker to sign a waiver allowing the test results to be shared with his or her school or with the relevant state educational agency. Even with a waiver from the student, the state will still need to negotiate the specific processes for data transfer with each of the respective test vendors. Apparently, one of the U.S. Department of Education's contractors for CTE has been working with Utah and CompTIA to address some of these issues relating to data sharing and student privacy statutes. In general, other state leaders indicate that testing vendors have been slow to work with states to resolve this issue.

Organizations such as NOCTI and Skills-USA offer assessments that can be administered by the school so that the data is immediately available for educational accountability.

4B-5 Issue: Using technical skill assessment for program improvement

Expectation

Teachers and faculty members will be expected to use data and information from approved assessments for the purpose of program improvement. To support this expectation, The System will periodically publish a state performance report that indicates how well students from Minnesota's schools and colleges perform on their technical skill assessments, on a pathway by pathway basis. In addition, The System and MDE will make available to teachers and faculty members training on how to analyze student performance data against the Common Core Competencies, and make appropriate modifications to curriculum and instruction.

Discussion

The accountability section of the Perkins Act (Section 113) says that the purpose of accountability is to assess the effectiveness of the state and the local recipients in achieving statewide progress in CTE, and to optimize the return on the federal investment in CTE.

So, while TSA provides measures of attainment for individual students, the primary purpose from the perspective of the Perkins Act is to promote program improvement.

It should be noted that this model of improvement has the same basic design challenge as the high stakes accountability system under the *No Child Left Behind* Act. Accountability is based on a model where each year's group of students is compared to the previous year's students. This approach of comparing different cohorts presents challenges because each group of students may have different levels of preparation and overall learning capacity. At a state level, when all scores are aggregated together, the differences from one year's students to the next year's students may be "washed out." But when those accountability measures are gathered and applied at the local level, particularly at the school and classroom level, year to year variability is a significant issue.

In attaching stakes to these student results, the Perkins Act does not impose any penalty on a district, college, or state if it attains at least 90% of the original performance target.

4B-6 Issue: Aligning secondary and postsecondary assessment instruments

Expectation

To the maximum extent possible, assessments selected for use in secondary CTE programs will count toward college credit in introductory postsecondary courses within the same pathway. Schools and colleges within a consortium will need to evaluate each selected secondary assessment, and make a determination about the appropriateness of the assessment to be used as an "advanced placement" test toward college credit, and the conditions under which such as assessment can be counted. The consortium shall provide clear information about how the assessment may be used to count toward college credit, and the procedures by which the qualified student will have the credit entered on a college transcript. In addition, the consortium must make this information about the opportunity to earn college credit through career pathway programs known to high school students.

The State Partners will also consider the use of assessments for use by adult students as a measure of "credit for prior learning."

Discussion

Under its consortium structure, Minnesota has promoted a concept that career and technical education programs begin in high school and continue through postsecondary work at a community or technical college. Broad-based secondary CTE programming is intended to prepare students to start any of several

related postsecondary programs. Using the approach, technical skill assessment at the secondary level, then, should reflect work completed as part of a larger program that spans from the high school to college years. As teacher/faculty working groups consult in developing Common Core Competencies, it is clear that a high school student with advanced high school studies in a particular CTE Pathway will know a significant amount of content that is covered in an introductory college level course. Whether that breadth and depth of student knowledge is enough to count for a college credit must be determined on a program by program basis, since some high school programs are more limited in scope than others.

Appendix 1.

Background on Perkins Act Requirements and U.S. Department of Education Guidance

PERKINS ACT BACKGROUND.

The operative section of the Perkins Act relating to Technical Skill Assessment (TSA) is found in section 113. The secondary measure is found in Sec 113 (b)(2)(A) and the postsecondary measure is found in Sec 113 (b)(2)(B).

The legislative language for the secondary and postsecondary measures relating to technical skill attainment is the same, indicating that…

> "***Each eligible agency shall identify in the State plan core indicators of performance for career and technical education students at the secondary level that are valid and reliable, and that include, at a minimum, measures of each of the following****:* …"

The indicator relating to technical skill proficiency is the following:

> ***"Student attainment of career and technical skill proficiencies, including student achievement on technical assessments that are aligned with industry-recognized standards, if available and appropriate."***

While the same definition applies to secondary and postsecondary systems, states are free to identify different measures for technical skill attainment at the secondary and postsecondary levels, even within the same program area.

The new Perkins Act requires measurements for technical skill attainment that are valid and reliable and are based upon industry-recognized standards, where they are available.

Assessments developed by third-party organizations, such as test and curriculum publishers, or industry associations typically meet standards of validity and reliability. However, just because a test meets the minimal requirements for validity and reliability does not necessary mean the assessment is of high quality or is aligned well with the program for which it is being recommended.

While States are not mandated to use assessments created by third-party organizations, if a state does not use a third-party assessment, it must use another assessment mechanism that meets criteria for validity and reliability. For example, in some states, the state department of education has developed a complete array of assessments for use in all its CTE programs, working with teacher-led working groups. In these cases, the state must conduct the necessary analyses and procedures to ensure the validity, reliability and overall quality of the assessments.

In all cases, whether it uses third-party assessments or state-developed assessments, the tests must draw upon industry-recognized standards, when such standards are available and appropriate to the educational purpose of the program.

This requirement for technical skill attainment is forcing many states to renew and upgrade their CTE content standards, and design new assessment mechanisms for programs that will allow greater comparability and accountability for program improvement.

Early discussion of "Gold, Silver, and Bronze" standards by federal government

Early into implementation of the Perkins Act of 2006, the U.S. Department of Education shared a concept for TSA that was known as the "Gold, Silver, Bronze standards."

In this concept, the Gold Standard was "any external, third-party assessment that objectively measures student attainment of industry recognized skills, appropriate to the educational level of CTE concentrators."

The Silver Standard was "A state-approved, teacher/instructor developed assessment that aligns with either state-established or industry-recognized standards (at the career cluster or pathway level) and that meets minimum state validity and reliability guidelines."

The Bronze Standards was "Any non-approved or non-assessment related indicator of technical skill attainment."

At the time, Department of Education staff discussed requiring states to phase out the Bronze standard measures over time, and move toward a system of measures that only consisted of Silver and Gold Standard measures.

Subsequently, the Department of Education withdrew this guidance, apparently because internal legal counsel advised that the Perkins Act did not permit the Department to make the distinction between Silver and Gold standards of measures. Currently, there is very little direct guidance on how states are to proceed with TSA. Essentially, it appears that states must develop their assessment approaches, include these approaches in their state plan for federal approval, and learn through the plan approval process whether or not the Department of Education approves its proposed measurement approaches.

Appendix 2.

Minnesota's Definitions of CTE Students -- Participants and Concentrators

In Minnesota, the state has defined Participants and Concentrators in the following manner:

Secondary:

A **Participant** is "a secondary student who earns 100 hours or more in one career field."

A **Concentrator** is "a secondary student who has earned 240 hours or more in one career field."

Postsecondary:

A Postsecondary **Participant** is defined as: "A community college student in The System who:

- Belongs to a particular fiscal year cohort, and
- Enrolled in a CTE program, and
- Declared as their degree intent (major) a CTE award"

OR

"A community college student in The System who:

- Belongs to a particular fiscal year cohort, and
- Enrolls in a career and technical course

A postsecondary **Concentrator** is defined as:

"A two-year college student in The System who:

- Belongs to a particular fiscal year cohort, and
- Enrolled in a **long-term** CTE program, and
- Declared as their degree intent (major) a CTE award"

OR

"A two-year college student in The System who:

- Belongs to a particular fiscal year cohort, and
- Enrolls in a short-term career and technical course, and
- Declared as their degree intent (major) a CTE award, and

- Completed and received the award in which they declared their intent."

According to footnotes in Minnesota's state Perkins plan, a long-term CTE program is any program that is at least 12 credits or higher in length. Programs covered are those in the System approved Program Inventory Database (PrinSys) and are defined as having Classification of Instruction Program (CIP) codes that are in one of the 16 career clusters. These programs are defined as "Perkins-eligible" in the System approved Program Inventory.

How is Technical Skill Attainment currently reported?

The Minnesota State Plan for the Perkins Act indicates that:

"Minnesota is in the process of identifying and using valid and reliable TSAs and is inventorying districts (and community colleges) as to the use of industry skill standards. It will take several years to identify these assessments and establish reporting procedures. Our intent is to establish a system whereby state benchmarks will be identified at the program of study level, and that progress toward these benchmarks will be aggregated. Until this system is operational, Minnesota proposes using a proxy measure of success in the programs calculated as passing grades in all career field courses taken to reach the Concentrator threshold."

For secondary schools, the current "proxy" for Technical Skill Attainment is the percentage of CTE Concentrators that earn at least 2 credits with passing grades over the number of CTE Concentrators that have been enrolled for 240 hours or more in a career field.

Postsecondary is also using a proxy measure: licensure pass rates. Currently aggregate data in three licensure areas are available: nursing, law enforcement and radiography.

The state plan also notes that the state will need to renegotiate baselines for this indicator when a system of TSAs is implemented.

Appendix 3. Background on "Validity and Reliability"

How will Minnesota assure that all the Technical Skill Assessments it authorizes will meet a standard of "valid and reliable?"

The Perkins Act requires all performance measures to meet a standard of validity and reliability. This term is not defined in the Perkins Act itself, and the U.S. Department of Education has not issued any guiding regulations on the subject. That said, the psychometric literature has well-established procedures and standards for determining test reliability and validity.

Test Validity: Validity generally refers to the degree to which a test or other measuring device is truly measuring what it intends to measure. For example, a test item that measures basic addition knowledge is not a valid measure of algebraic thinking, even though both fall within the broad umbrella of mathematics. For an assessment to be valid, the test items must accurately measure the knowledge or skill they are purported to measure. And as a whole, the assembled test must accurately measure the level of knowledge and skills that it claims to measure.

Within the general topic of validity, there are several types of validity and methods for determining such validity. "**Concurrent validity**" refers to an assessment's ability to measure knowledge and skills in a way that directly correlates to another measure of knowledge and skills. For example, if the results for Minnesota students on the state's math and science tests closely correlate results on the international TIMMS math and science test, then the Minnesota tests would demonstrate "Concurrent Validity."

Another concept is "**content validity**" meaning that the test itself accurately measures the critical knowledge and skills within a particular domain. Within the area of content validity, there is face validity where subject matter experts conduct a review of the measurement device and determine how closely it reflects the field. Minnesota has done some of the work of Content Validation by assembling teacher and faculty subject experts. Still, more work needs to be done to engage business and industry subject matter experts. Statistical analyses such as factor analyses should also be performed on assessments to determine the extent to which individual test items are measuring the overarching construct they are intended to measure. For example, if five test items are intended to measure knowledge of turf management, responses to those test items should be correlated to one another. As well as statistical analyses being performed on the overall assessments, individual item analysis is also needed to ensure that items are within an appropriate range of difficulty levels so as to be able to measure growth and so forth.

A third concept of validity is called "**predictive validity**." In this approach, results of an assessment could be used to predict an individual's performance in other settings, such as on other tests, or in college and/or the workplace. Predictive validity is established by linking an individual's scores on a test with other outcomes and determining if there is a consistent pattern of correlation.

One possible use of high school CTE assessments is to conduct predictive validity as to whether students who were successful on the high school test might also do better than average in college-level studies of the CTE program.

Reliability. Reliability refers to the consistency of results for a test or measuring device. In the same way that a scale should accurately measure poundage from one use to the next, a reliable assessment should measure student knowledge and skills accurately from one usage to the next. A reliability coefficient can be generated that indicates the level of reliability of the assessment. When the coefficient approaches 1.0 (i.e. 0.88 or 0.92) this indicates a high level of reliability.

A "**test-retest" approach** measures how closely the scores match for an individual that takes and then retakes the same test. If you assume that no new learning has occurred between the test and the re-test, then the test should yield essentially the same score for the taker. There is a "memory effect" that must be accounted for since a student will remember test items that are exactly the same. One approach to minimize the "memory effect" is to construct two tests that closely parallel each other in the concepts that are being tested, but that use different test items.

Another approach for reviewing reliability is the "inter-rater reliability" in which results from two different test takers are compared. Statistical analyses to determine internal consistency (via Cronbach's Alpha) is also a standard analysis conducted to determine reliability.

Appendix 4.

Online survey about teacher and faculty use of assessments

In early May 2009, Meeder Consulting launched an on-line CTE Assessment Survey. The purpose of this survey was to gather information on what teachers and faculty are currently doing to assess technical skill attainment as part of their CTE programs. The responses to this survey will help to determine what assessment data are currently available from CTE programs and will inform the feasibility of different assessment approaches to measuring technical skill attainment. A complete summary report is being prepared, however a few highlights from the results are included here.

Participants

- 189 participants completed the survey.
- 62% of the responses were from high school teachers and 38% were from postsecondary instructors.
- All of the clusters have had at least one response with the exception of: Finance and Government/Public Administration
- All consortia had at least one response with the exception of: Carlton County, East Range, Hibbing-Chisholm, Itasca County, South Metro, and Southwest Metro.

Technical Skills

- 62% of respondents indicated that the technical skills taught in their programs are explicitly aligned to industry skills.
- For those whose skills are aligned, 91% indicated that they reviewed industry skill standards to make sure they were embedded in their curriculum.

- Respondents indicated that they used the following methods to align to industry skills: Review competencies list by industry organization standards or national organization (70%); Interview with local or regional business partners (52%)

Current Assessments

- **At least 18% of respondents use a third-party assessment (developed by a professional association) to measure technical skill attainment in their programs.**
- 26% of respondents use one primary assessment to measure technical skill attainment.
- 70% of respondents use a combination of two or more assessments.

	# of responses	% of all respondents
Teacher-developed assessments based on local standards	126	68%
Teacher-developed assessments based on national industry standards or professional association standards	100	54%
Standardized Assessment developed by Professional Association	34	18%
Standardized Assessment developed by an Industry Association	20	11%
Standardized Assessment developed by a Vendor (Skills USA, NOCTI, etc.)	24	13%
Standardized Assessment included in a Textbook	52	28%
Other	16	9%

Appendix 5.

How student and accountability data is currently gathered and reported

Minnesota Department of Education

In the late 1990's, the Minnesota Department of Education developed an on-line, computerized system to collect, store and report CTE assessment results. This system is referred to as the Carl Perkins "P" File. It is maintained by the Department of Education; however, the data contained in the file is uploaded on an annual basis to the master file by individual school districts via their approved software vendors.

The Carl Perkins "P" File contains the following fields:

- School Year
- School District Number
- School District Type
- School Number
- Program Code
- Course Code
- Course Length (in minutes)
- MARSS ID Number
- Grade Received
- Teen Single Parent (Yes/No)
- Displaced Homemaker (Yes/No)

The Carl Perkins "P" File contains multiple data tables, many of which cross-reference other databases maintained at the state level. For example, per state law, every CTE program must be approved on 5-year cycle and teachers must have program approval on file and hold the appropriate licenses to teach in the program. This information is stored in several databases: the Program Approval Data Base, the Valid Course ID Table and the Table of CTE Programs and Licenses (Table "C"). Assessment data that is uploaded to the Carl Perkins "P" file must correspond with the course data in these other databases or it will be rejected and will need to be corrected and resubmitted.

Additional databases that are cross-referenced with the Carl Perkins "P" file include STAR (Staff Automated Reporting System), MARSS (Minnesota Automated Reporting Student System), Assessment Data (state mandated testing), Program Approval Database and Valid Course ID Table. The MARSS ID Number field is the link between the Carl Perkins "P" file, MARSS, and Basic Standards/MCA (assessment) databases.

In the future, a list of approved assessments for a particular pathway could be stored in either the Carl Perkins "P" file or the Program Approval Database. Local districts would be responsible for determining when a student reaches Concentrator status and make sure the student takes the requisite assessment.

If districts report assessment results as part of the student file, MDE's system will be able to identify which of the concentrators shows an assessment record and which of those concentrators are reported as passing, assuming the district reports all students who took the TSA assessment instrument.

The Minnesota State Colleges and Universities System

The Minnesota State Colleges and Universities maintain postsecondary student data through a single data records system called the Integrated Student Record System (ISRS). ISRS is an operational data system used by each college and university, but the information is also accessible to staff in the Office of the Chancellor. The type of information maintained in ISRS includes student demographics, student course and grade information, majors and data on the receipt of certificates, diplomas and degrees.

In addition to a student ID that the student uses at an individual institution, ISRS also contains a unique identifying number for each individual student across all the institutions in the System that they may attend. This allows the System to track students as they transfer to different colleges and universities within the System. The use of National Student Clearinghouse data allows for following students to other colleges and universities both within and outside of Minnesota. However, there is currently no identifier that follows students from high school to postsecondary. The Office of the Chancellor and the Minnesota Department of Education, along with the Minnesota Officer of Higher Education, are continuing to work to try to develop better ways to address this issue.

The Office of the Chancellor does not currently have access to individual student skill assessment data. This information is not entered into ISRS. As part of a system-wide accountability effort, data are collected on licensing in three areas: nursing, radiography and law enforcement. This information is currently available at the aggregate (school) level but not at the individual student level.

Federal and state data practices provisions have made the collection of this data at the student level more difficult. The aggregate data are not stored in ISRS but are maintained in a separate database at the Office of the Chancellor. This licensing information is currently being used as a proxy measure for post-secondary skill attainment for Perkins Reporting.

Perkins data are not submitted separately by each college. Rather, a programmer at the Office of the Chancellor generates a condensed set of data from ISRS for each entry cohort. The data set is made available to each college at the student level, along with a report for each college on the Perkins accountability indicators. The Perkins reporting data, however, do not include the licensing information since that data is only available at the institution level, rather than for the individual student.

There are existing tables/entry screens built in ISRS to record testing information, so there is already a mechanism for collecting data when TSA results become available for individual students in the future. For teacher-delivered assessments, the colleges and universities could enter the data directly into ISRS. For third-party assessments, staff at the Office of the Chancellor could access the data from a vendor and then match the data to individual student records in ISRS. The data would be uploaded to the system centrally but would be accessible to each college or university. This would, however, require that information on the student ID and the college attended be included in the data that are loaded into ISRS.

Federal and state privacy statutes and regulations will continue to govern when, how, and by whom any individual student educational record may be accessed.

NOTE: This report was prepared for the Minnesota State Colleges and University System and the Minnesota Department of Education by the Meeder Consulting Group, LLC, a policy and research firm based in Columbia, Maryland.