OCTAE Customized Technical Assistance to States
North Carolina—Metrics for Secondary CTE Program Evaluation

Prepared under contract to
U.S. Department of Education

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RTI International is a trade name of Research Triangle Institute.
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Background and Technical Assistance Strategy

The Office of Career, Technical, and Adult Education (OCTAE), Division of Adult and Technical Education (DATE) sponsors customized technical assistance to support states and grantees in improving the quality of their career and technical education (CTE) data and Perkins IV accountability systems.

The North Carolina Department of Public Instruction (DPI) requested technical assistance on student and program outcomes for school districts’ CTE program reviews. The request is linked to DPI’s ongoing effort to develop a toolkit for districts to use when conducting required evaluations of their CTE programs. North Carolina currently has a Career and Technical Education Program Review Overview document that describes the steps needed to conduct a program review with a consultant. In contrast, the toolkit would include rubrics that would assist school districts to conduct self-reviews on an ongoing basis without outside assistance.

In consultation with DPI staff members, RTI International developed the following three-step approach to address the state’s request:

1. **Research CTE program evaluation models and metrics from other states**—RTI conducted a review of program evaluation models and processes in other states and provided a summary of relevant examples to North Carolina. Particular attention was paid to indicators of student and program performance that CTE educators could use for continuous improvement.

2. **Identify potential CTE quality indicators of interest for North Carolina CTE programs**—RTI consulted with state and local CTE administrators regarding which of the candidate performance indicators developed in step 1 would be useful for North Carolina’s CTE Program Review/Evaluation Toolkit. These consultations included conference calls with state agency staff, a webinar with the CTE advisory group on February 19, 2015, and a presentation and facilitated discussion with attendees at the 2015 CTE Directors Spring Conference on March 2.

3. **Provide a summary report that includes suggestions for next steps**—As a final step, RTI summarized the results of the above activities, created a list of possible
indicators and additional resources, and developed a set of suggestions for next steps.

This report reflects the research and consultations conducted in steps 1 and 2, as well as descriptions of the meeting sessions and input from the participants. An initial draft of the report was shared with DPI staff for comment and to ensure that the information included would meet their technical assistance needs. The final report incorporates revisions and clarifications added in response to DPI’s feedback.
Step 1: CTE Program Evaluation

Performance Metrics From Other States

To begin step 1, DPI CTE staff and RTI researchers held a conference call to determine the focus and scope of the performance metric review. DPI staff indicated a primary interest in quantifiable and objective metrics that measure inputs, outputs, and outcomes, rather than qualitative and more descriptive metrics of program development and processes. Although DPI staff felt the latter group of metrics to be important, they also felt that borrowing such metrics from other states would be difficult, since they typically reflect local policies and practices and may not apply to North Carolina’s needs. DPI staff also noted that these metrics would be the focus of a later stage in the toolkit development process.

DPI staff shared some priority areas for metrics, including metrics that connect CTE program development to local labor force demands and metrics that connect secondary CTE programs with the state’s community college system, such as data on articulated credit and dual enrollment. DPI staff members also requested guidance on setting metric targets. In addition, they noted North Carolina’s introduction of diploma endorsements in 2014–15 as a potential metric topic; recipients of the state’s new career endorsement must have a minimum 2.6 GPA, concentrator status in a CTE field, and an industry-recognized credential. DPI staff members also recommended including CTE program review materials from other states that North Carolina had found helpful in the past in the review. These states included California, Florida, Minnesota, and Ohio.

After the planning discussion, RTI conducted the review during January 2015. As part of this task, RTI reviewed CTE program review materials from fifteen states and found examples of performance review metrics relevant to North Carolina’s needs in eight—Michigan, New York, Texas, Washington, and the four states recommended by DPI. Although RTI prioritized quantitative metrics in the search, the final list also included some qualitative metrics to address important topic areas for which quantitative metrics were either limited or unavailable, such as curriculum and program design. Three different types of metrics emerged in the course of the review:

- **Process metrics:** Qualitative metrics designed to indicate whether staff members are engaged in the types of ongoing program development work needed to support quality programs. Example: “Conduct ongoing analysis of economic and workforce trends to identify regional [Programs of Study] POS to be created, expanded, or discontinued.”
• Qualitative metrics: Qualitative metrics that describe aspects of CTE programs and CTE program-related activities. Example: “How do teachers involve business and industry in your program (provide examples)?”

• Quantitative metrics: Numeric data about CTE programs and CTE program-related activities. Example: “Proportion of students participating in experiential learning opportunities (lab work, co-ops, simulated workplace, mentorships, internships, pre-apprenticeships, apprenticeships).”

RTI compiled candidate metrics from each of the states in a series of tables to share with DPI. These tables also included a summary of the information from the states that RTI felt best met DPI’s needs. The summary table listed ten CTE program review topic areas and, within each area, listed from one to six performance metrics. RTI then shared the findings of the review with DPI staff members and revised the summary response according to their feedback and suggestions.
Step 2: Review of Candidate Metrics

Once an initial set of topics and metrics developed from the review was finalized, RTI prepared a handout and a webinar presentation to share with DPI’s 20-member CTE Advisory Group in a virtual meeting in February 2015. RTI shared the handout with the group prior to the meeting with a description of the project and a request for the participants to review the metrics and come to the meeting with comments (Exhibit 1).\(^1\)

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\(^1\) The PowerPoint presentation is included in the appendix.
### Exhibit 1: Handout for the CTE Advisory Group Webinar, February 19, 2015

<table>
<thead>
<tr>
<th>Area</th>
<th>Measures/Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student engagement</strong></td>
<td>1. Number of program participants</td>
</tr>
<tr>
<td></td>
<td>2. Number of program concentrators</td>
</tr>
<tr>
<td></td>
<td>3. Proportion of participants/concentrators</td>
</tr>
<tr>
<td></td>
<td>4. Proportion of underrepresented students (nontraditional by gender, underrepresented racial/ethnic groups)</td>
</tr>
<tr>
<td></td>
<td>5. Proportion of career and technical education (CTE) concentrators participating in CTSOs</td>
</tr>
<tr>
<td></td>
<td>6. Proportion of CTE concentrators participating in work-based learning</td>
</tr>
<tr>
<td><strong>Facilities and equipment</strong></td>
<td>7. Program equipment is up to date and meets current industry standards</td>
</tr>
<tr>
<td></td>
<td>8. Equipment is in good working order and meets safety requirements</td>
</tr>
<tr>
<td></td>
<td>9. Adequate classroom and/or workshop space is available</td>
</tr>
<tr>
<td><strong>Student assessment</strong></td>
<td>10. Proportion of CTE concentrators earning the National Career Readiness Certification (NCRC)</td>
</tr>
<tr>
<td></td>
<td>11. Proportion of concentrators in each program attempting a credential</td>
</tr>
<tr>
<td></td>
<td>12. Of those who attempted, proportion who earned a credential</td>
</tr>
<tr>
<td></td>
<td>13. Student performance on end-of-course examinations</td>
</tr>
<tr>
<td><strong>Counseling and guidance</strong></td>
<td>14. Student participation in guidance activities (creation of graduation plan, etc.)</td>
</tr>
<tr>
<td><strong>Curriculum and program design</strong></td>
<td>15. Program has evidence that course standards are aligned with the knowledge and skills needed by industry</td>
</tr>
<tr>
<td></td>
<td>16. Program has a documented grade 9 through 14 pathway or program of study that can be shared with students and parents</td>
</tr>
<tr>
<td><strong>High school completion</strong></td>
<td>17. Proportion of concentrators earning a high school diploma in four years (&quot;on time&quot; graduation)</td>
</tr>
<tr>
<td></td>
<td>18. Proportion of concentrators earning a high school diploma Career Endorsement</td>
</tr>
<tr>
<td></td>
<td>19. Proportion of concentrators earning a high school diploma College Endorsement or Academic Endorsement</td>
</tr>
<tr>
<td><strong>Instructors</strong></td>
<td>20. Proportion of instructors certified in their teaching field</td>
</tr>
<tr>
<td></td>
<td>21. Proportion of instructors with industry certification/credentials relevant to the subject they teach</td>
</tr>
<tr>
<td><strong>Postsecondary preparation</strong></td>
<td>22. Proportion of CTE concentrators attempting to earn postsecondary credits in CTE (or other) fields</td>
</tr>
<tr>
<td></td>
<td>23. Proportion of students earning any postsecondary credits in high school</td>
</tr>
<tr>
<td></td>
<td>24. Proportion of students earning postsecondary credits in high school in CTE fields</td>
</tr>
<tr>
<td></td>
<td>25. Proportion of students/concentrators earning community college certificates in their career field</td>
</tr>
<tr>
<td></td>
<td>26. Proportion of program concentrators who enroll in a public institution of higher education who require developmental education</td>
</tr>
<tr>
<td></td>
<td>27. Proportion of CTE concentrators who enroll in postsecondary education within a year of high school graduation</td>
</tr>
<tr>
<td><strong>Connections with business and industry</strong></td>
<td>28. Advisory council members represent employers in state or regional Hot Jobs fields</td>
</tr>
<tr>
<td></td>
<td>29. Program is aligned with Hot Jobs fields (e.g., courses and topics reflect employer needs in these fields)</td>
</tr>
<tr>
<td></td>
<td>30. Student recruitment efforts include information about Hot Jobs fields</td>
</tr>
</tbody>
</table>
The presentation outlined the process used to identify the candidate metrics, including the review of materials from other states and DPI review. The presentation then described the three types of metrics found in the CTE program review plans of other states and explained the focus of the current effort on quantitative metrics. After the introduction, the presentation then reviewed each of the topic areas and candidate metrics and invited audience feedback. The advisory group’s feedback included: adjusting some of the metrics to address CTE enrollees and not just concentrators, suggestions for new metrics to include in the next round, and possible data sources and alternatives for metrics for which data may not be available.
Step 3: Performance Metric Recommendations

In preparation for the CTE Spring Conference in early March 2015, RTI prepared a handout and a webinar presentation that reflected the CTE advisory group’s input. The meeting included about 200 attendees from CTE programs in school districts statewide. After an introduction by the CTE state director, the presentation described how RTI worked with DPI and CTE administrators to select the candidate metrics, including the review of materials from other states and the DPI and advisory group reviews. The presentation also introduced the three types of metrics and the focus of the current effort on quantitative metrics. After the introduction, each of the topic areas and candidate metrics were presented. At the end, the meeting participants formed groups of about 10 participants to review and discuss one topic area and associated candidate metrics. The groups recorded their comments and ideas in a Google document.

The feedback provided by the groups in the Google document are presented in the tables below, which are organized by topic area.2

Student Engagement

One group addressed the topic area of student engagement, which includes numbers of program participants and concentrators, other metrics for student involvement, and student participation in Career and Technical Student Organizations (CTSOs) and work-based learning programs.

As the comments noted, a lot of these metrics are “pretty basic” and are already tracked for other reporting requirements. The meeting participants expressed concerns about how to measure student involvement in CTSOs and work-based learning opportunities. In particular, respondents noted that student participation rates would not indicate the level of student involvement for CTSOs, which might be important to know. For work-based learning opportunities, the comments suggested that this metric might disadvantage rural districts where opportunities for establishing work-based learning opportunities are few.

2 The responses have been reorganized and lightly edited for readability, and repeated data sources, suggestions, or comments omitted. In the Google document, the candidate metrics and respondents’ comments did not always line up. In those cases, the analysts matched the metrics and comments based on content.
### Exhibit 2. Topic area: Student engagement

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Number of program participants | • Special Pops Data, CDP+, LPS  
• Department of Public Instruction (DPI) provides in LPS  
• PowerSchool  
• Rosters from teachers | • Those are raw numbers that indicate student engagement. If you have that, it demonstrates student success at that level.  
• Pretty basic.  
• The number is not as great as the percentage of students that participated in a [career and technical education] CTE course.  
• One indicator of the quality of a program is that students are willing to sign up for it. |
| Number of program concentrators | • PowerSchool  
• LPS  
• PowerSchool course enrollments | 12th-grade snapshot meaning generally now we do not know until later grades that they are a concentrator, rarely do students get dumped in second level.  
• Not as important as ratio.  
• Is this indicator based on the total CTE program? Or is it based on clusters or program area?  
• State needs to require a concentration again.  
• Consideration needs to be given to phasing out one program and introducing another.  
• Have true CDCs to make sure this happens. |
| Proportion of CTE concentrators among all graduates | • You may get the data from the CDCs or SPCs  
• Rosters from teachers  
• Surveys | • Those are raw numbers that indicate student engagement. If you have that, it demonstrates student success at that level.  
• Shouldn’t be competing, need to provide multiple ways to achieve both academic and CTE diploma recognitions, suggests stronger program if more.  
• It is important measurement to determine the percentage of students who took a CTE course and continued through a concentration.  
• CDCs can help with this! |
| Proportion of CTE enrollments from underrepresented groups (nontraditional by race/ethnicity, gender) | • CDCs  
• Survey/PowerSchool | Its good information because it is part of our federal goals.  
• Most in the group thought this was not a critical measurement. Although the discussion included making sure it was part of the marketing. There was one in the group who thought that this was very important.  
• Very hard to have a direct effect on this measure. You can encourage students to take certain classes but there are many factors that influence whether or not they sign up for that class. |
### Exhibit 2. Topic area: Student engagement—Continued

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Proportion of CTE enrollments participating in CTSOs | • PowerSchool  
• LPS  
• Rosters  
• Enrollment in chapter and participation in regional and state competition | • It is hard to determine reliable data for this question.  
• Measure of teacher engagement more so than student engagement  
• Very important to use this resource as a tool to build student knowledge in various program areas.  
• This is an important indicator but difficult to measure. Active members have to be involved somehow, not just how many you have signed up.  
• Locally we would have to develop a way to collect this information. Also, like credentials, someone will have to determine what "counts" in this category. |
| Proportion of CTE enrollments engaging in workforce-based learning or other experiential learning opportunities | • PowerSchool  
• LPS  
• GDVS  
• Number of students who do not participate in workforce-based learning due to transportation or other issues | • It is difficult to get accurate data from these measures.  
• The reason we don’t have more is because they do not have transportation, or limited resources to get them, and engagement of local business and industry.  
• There has to be some sort of availability index associated with this. Rural eastern NC counties do not have the industries that the Triad and Triangle have for instance. |
| Other metrics | • There should be some type of indicators pertaining to the proficiency or technical attainment in the courses.  
• Outside help for encouraging students to complete a concentration. | |

### Summary Ideas and Next Steps

- The reviewers for this topic area indicated that the metrics relating to student participation levels were an expected part of CTE program review.

- To address the reviewers’ concerns regarding the measurement of CTE extracurricular activities, DPI might revisit options for these metrics at a future meeting. Candidates for CTSOs, for example, include chapter enrollment, the number of activities held and attendance for those activities, and participation in regional and state competitions.
Facilities and Equipment

Spring conference participants also considered candidate metrics related to CTE program facilities and equipment. The candidate metrics for this topic area addressed the condition and safety of CTE programs’ equipment, as well as the adequacy for programmatic needs and industry practices. In conjunction with this topic area, DPI staff noted that the CTE Facilitators Planner, which will provide information about CTE program equipment needs, is currently in development.
### Exhibit 3. Topic area: Facilities and equipment

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment meets career and technical education (CTE) program guidelines</td>
<td>• Program equipment requirements&lt;br&gt;• Course blueprints&lt;br&gt;• LPS&lt;br&gt;• Annual inventory forms&lt;br&gt;• Essential standards equipment list&lt;br&gt;• Specification sheets&lt;br&gt;• Industry standards access</td>
<td>• Need specific information regarding what is needed and what is wanted.&lt;br&gt;• What you must have access to rather than actual equipment on hand.&lt;br&gt;• Keeps programs compliant and consistent across the state. Maintain safety standards. Maintain the strongly recommended student enrollment.&lt;br&gt;• [Department of Public Instruction] DPI needs to visit these lists often and needs to keep its CTE equipment up to date and realistic.</td>
</tr>
<tr>
<td>Equipment meets safety requirements and is in good working order</td>
<td>• Inventory reports&lt;br&gt;• Occupational Safety and Health Administration (OSHA) and Fire Codes (Regulatory)&lt;br&gt;• MSDS Sheets&lt;br&gt;• Essential standards&lt;br&gt;• Maintenance check list&lt;br&gt;• Safety inspection/walkthrough by facilities director&lt;br&gt;• Annual audit and safety or injury record</td>
<td>• Helps with budget alignment.&lt;br&gt;• Guides allocation of budget.&lt;br&gt;• Civil rights compliance.&lt;br&gt;• Labs should reflect industry standards.</td>
</tr>
<tr>
<td>Equipment is up to date and relevant to industry standards</td>
<td>• Community partnerships&lt;br&gt;• Advisory board member input&lt;br&gt;• CTE curriculum&lt;br&gt;• Audit</td>
<td>• How many versions behind are we?&lt;br&gt;• Limits to capital outlay should be considered.&lt;br&gt;• Funding prohibits industry standards.&lt;br&gt;• Lucky to have funds to ensure standards.&lt;br&gt;• This may be a difficult area to maintain consistent and accurate assessment.</td>
</tr>
<tr>
<td>Adequate classroom and/or workshop space is available</td>
<td>• Safety requirements&lt;br&gt;• Capacity guidelines&lt;br&gt;• Program area equipment/course guide&lt;br&gt;• Master schedule&lt;br&gt;• Visual audit</td>
<td>• At the mercy of school and local decision making.&lt;br&gt;• Depends on school enrollment, physical school layout, and location.&lt;br&gt;• We are all left to the discretion of what the district has available for our use. Now if DPI wants to develop or recommend room and facility standards, that might cause districts to consider better allocation for capital resources.</td>
</tr>
<tr>
<td>Instructional facilities are clean, well organized, and conducive to learning.</td>
<td>• Health inspector reports&lt;br&gt;• School-based insurance report&lt;br&gt;• Student surveys&lt;br&gt;• NATF and other outside audits&lt;br&gt;• Laboratory inspections/visual audit&lt;br&gt;• Principal observation&lt;br&gt;• Equipment to student ratio&lt;br&gt;• Ease of accessibility to students&lt;br&gt;• IDEA/civil rights compliance</td>
<td>• This could be subjective without specific guidelines in some areas.&lt;br&gt;• Directly related to multiple external factors such as buildings and funding.&lt;br&gt;• Professional development for lateral entry teachers especially regarding the management of a lab setting.&lt;br&gt;• While it can help address safety concerns, it is not the most critical part of learning.&lt;br&gt;• Agree with this but may refer to the last question and be contingent on the adequate space and facilities.</td>
</tr>
</tbody>
</table>
Summary Ideas and Next Steps

- The reviewers had many data source suggestions for these metrics, such as comparing program equipment to either industry or other standards and conducting inventory and inspections.

- The comments noted that equipment and facilities are dependent on factors that are not in the control of program staff, such as district funding. Audits and comparisons to industry standards might, however, be useful for convincing district decision makers of the need for additional resources.

Technical Skill Assessment

Another topic that the meeting attendees covered was the measurement of CTE students’ technical skills. The candidate metrics addressed CTE students’ participation in opportunities to earn industry-recognized credentials, including the National Career Readiness Certification (NCRC), which is offered in all districts with state funding support.
### Exhibit 4. Topic area: Technical skill assessment

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of career and technical education (CTE) concentrators earning credentials through the National Career Readiness Certification (NCRC)</td>
<td>• Elements • Community College CRC database • Powerschool - data could follow students and those with access to PowerSchool could view student credentials without having to have access Elements</td>
<td>• WIN and KeyTrain - could we facilitate a workforce development board presidents/representative discussion about this • The Lumbee Board of Governance pays for WIN access to their program area.</td>
</tr>
<tr>
<td>Proportion of CTE enrollments attempting an industry-recognized credential (among those with an aligned course)</td>
<td></td>
<td>• Attempts do not equate to effectiveness. • Only those paid for by [Department of Public Instruction] DPI. Some districts cannot afford a wide variety of credentials. • More difficult to keep up with attempts because of how many times the students could take them.</td>
</tr>
<tr>
<td>Among those attempting, proportion who earned a credential</td>
<td></td>
<td>• Equity in ability to afford the credentials would need to be assured. • More work in communities to see the value in the credentials. If we push the credentials and the employers are unaware or value them in hiring, this disconnect diminishes our push for students.</td>
</tr>
</tbody>
</table>

### Summary Ideas and Next Steps

- The reviewers expressed some reservations about tracking the number of students who attempted a credential and whether this data would be a useful measure of program effectiveness.
- The reviewers noted that access to technical skill assessments may not be equal across districts. To reflect these variations, targets might be limited to programs or only count those students that have access to technical skill assessments.

### Career Development

The group also addressed the career development topic area. Since many states are in the process of developing comprehensive career guidance programs, candidate metrics for this topic area were few. One summary candidate metric was shared with the group members for their input, and the reviews offered suggestions for how this metric might be adjusted for use in a program review toolkit.
### Exhibit 5. Topic area: Career development

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student participation in online virtual tours, mentoring relationships, work</td>
<td>• Career Cruising/CFNC</td>
<td>With Career Cruising, you can find a mentor within the job field you desire and be able to look up local jobs, state-wide jobs, and national jobs.</td>
</tr>
<tr>
<td>with Pathways to Prosperity, visits to employers, career fairs, creation and</td>
<td>• CCP courses are a part of Pathways to Prosperity and can be tracked through PowerSchool</td>
<td>Mostly soft data would be used for this measure. Can we truly validate the data?</td>
</tr>
<tr>
<td>updates of graduation plans</td>
<td>• Career development plans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Graduation plans in PowerSchool (with identified career pathway; follow on to postsecondary training or credential)</td>
<td>Career fairs are important for younger students in choosing a career pathway.</td>
</tr>
<tr>
<td></td>
<td>• Graduation plan participation: Number of students participating by school and number of under-represented minorities</td>
<td>One of the major issues to consider, with the small counties. Districts that have people occupying multiple roles, and not enough attention is placed in each area.</td>
</tr>
<tr>
<td></td>
<td>• Lesson plans</td>
<td>Update the term &quot;graduation plan&quot; to &quot;career plan&quot; to give specifics to the career development focus.</td>
</tr>
<tr>
<td></td>
<td>• Flyers/advertisements for career fairs</td>
<td>It would be great to have a repository of specific venues for each indicator that identifies formats that were successful. This would allow educators to use proven examples that could be used.</td>
</tr>
<tr>
<td></td>
<td>• Tracking sheets for Pathway to Prosperity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Internships and job shadowing (internships would be on PowerSchool)</td>
<td>Start the mentoring process at the middle school, then branch it off to the high school and community college.</td>
</tr>
<tr>
<td></td>
<td>• Mentorships (ones where relationships are developed)</td>
<td>Success in career development should include a component that continues to monitor the student after high school.</td>
</tr>
<tr>
<td></td>
<td>• District career-focused activities: numbers of speakers, field trips, mentoring,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>employer visits, and career fairs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Poll educators about online virtual tours</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Results of a pre-defined survey about the event/activity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Participation rates in career events</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Participation in CTSOs</td>
<td></td>
</tr>
</tbody>
</table>

### Summary Ideas and Next Steps

- The reviewers provided a variety of suggestions for expanding the candidate metric, focusing on tracking student participation in graduation or career plans and district activities related to career development.

- Guidance and career counselors might have additional suggestions for metrics related to this topic area.
High School Completion

This topic area addressed on-time high school graduation and North Carolina’s new diploma endorsements. Many states have instituted new programs to underline the importance of high school graduates being both college and career ready. In 2014–15, North Carolina initiated diploma endorsements that indicate graduates have met a set level of college and/or career readiness by meeting a set of standards, including a threshold grade point average (GPA), reaching concentrator status, et cetera.

**Exhibit 6. Topic area: High school completion**

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of career and technical education (CTE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>concentrators earning a high school diploma in four</td>
<td>• Graduation rates</td>
<td>Data is available and relevant and is also part of accountability model.</td>
</tr>
<tr>
<td>years (&quot;on time&quot; graduation)</td>
<td>• WorkKeys testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Thinkgate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The graduation rate for CTE students is higher.</td>
</tr>
<tr>
<td>Proportion of CTE concentrators earning a career</td>
<td>• WorkKeys results</td>
<td>Offers a way for CTE students to earn that extra endorsement on their</td>
</tr>
<tr>
<td>diploma endorsement</td>
<td>• Credentials</td>
<td>diploma and support the career pathways.</td>
</tr>
<tr>
<td></td>
<td>• Thinkgate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Diploma analysis report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Transcripts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Homebase</td>
<td></td>
</tr>
<tr>
<td>Proportion of CTE concentrators earning a college or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>college UNC diploma endorsement</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Proportion of CTE concentrators earning both career</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and college UNC endorsements</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summary Ideas and Next Steps**

- Since North Carolina’s diploma endorsements are new, setting targets for metrics that track the proportion of CTE students earning these credentials may need to wait until the program has been in place for a few years.

**Postsecondary Preparation**

Meeting participants also considered metrics related to CTE students’ postsecondary preparation. Like many states, North Carolina has opportunities for students to earn postsecondary credits while completing high school. The proposed metrics address these opportunities, as well as postsecondary enrollment.
### Exhibit 7. Topic area: Postsecondary preparation

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Proportion of career and technical education (CTE) concentrators enrolling in courses that offer postsecondary credit | • PLTW through RIT  
• National Student Clearinghouse  
• PowerSchool/transcripts  
• Postsecondary institutions  
• WestEd | • Issues with data sources.  
• Will be a good evaluation measure. |
| Proportion of CTE concentrators earning Career and College Promise credit | • From CCP  
• Career development coordinators  
• PowerSchool  
• Central office-level partnership with institution | • Would need [memorandum of understanding] MOU on file.  
• Some LEAs don’t have a lot of CCP options.  
• Needs to be CTE participants. Need to clarify CCP transfer courses vs. CTE. |
| Proportion of CTE concentrators earning articulated credits and earning credits in CTE fields | • Central office-level partnership with institution  
• PowerSchool | • Have to have a strong relationship with outside agency.  
• How would you track this information, the student may take the course but we do not know if they take advance of the credit.  
• Do not understand this question. If a student gets articulated credit it must be CTE course. |
| Proportion of CTE concentrators who enroll in postsecondary education within a year of high school graduation | • Concentrator survey | • Concentrator survey will help determine the numbers. This will need to come from community college. |
| Proportion of those who enroll in higher education that require developmental/remedial education (public institutions of higher education only) | • Community college | • Hard data to collect.  
• Confidential information, tough to obtain. How do you know it is good data? |
| Other metrics | • Measure of student and parent satisfaction - more qualitative, but VERY important  
• Dropout rate from the college level  
• ACT  
• WorkKeys | |

Note: The Google Docs input for this topic area had mixed columns and rows. The above reflects RTI’s attempt to match the candidate metrics and responses based on the comments’ content.
Summary Ideas and Next Steps

- The comments note that data on the postsecondary credits that students earn in high school may be challenging to access. Postsecondary data specialists may be able to provide guidance on data strategies.

- The reviewers had similar comments regarding data on developmental or remedial education. If data are unavailable or inaccessible, an alternate qualitative metric might address districts’ efforts to partner with community colleges on sharing information on students’ readiness for postsecondary work.

Connections With Business and Industry

Meeting attendees were asked to review three candidate metrics associated with connections between CTE programs and industry and employers.
Exhibit 8. Topic area: Connections with business and industry

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Advisory council members represent employers in state or regional Hot Jobs fields\(^1\) | • Advisory Council rosters and minutes  
• NC DOL correlating documents  
• Local Chambers of Commerce  
• Local Workforce Development Board | • Because of the region our schools are located in many of the Hot Jobs are not a reasonable place of employment in that area.  
• We would not want to overload an advisory council with Hot Jobs representatives. We have an obligation to those industries within our service area which need a certain number of employees for long term sustainability. While their industry may not represent a Hot Job, they are a major contributor to economic development.  
• Having the representatives from industry helps adds relevance. Having the partnership between educational institutions and business industry helps to strengthen career and college readiness. |
| Program is aligned with Hot Jobs fields (e.g. courses and topics reflect employer needs in these fields) | • Course offerings  
• Enrollment  
• Course guides/offerings  
• NC Works  
• Local Chambers of Commerce | • Need to look at Hot Jobs on a regional basis instead of a statewide model.  
• Suggest "reflect needs and jobs in your area" rather than Hot Jobs.  
• There is a delicate balance between Hot Jobs and sustainable jobs. Some hot jobs that have been promoted through various entities sometimes have become "un-hot" due to federal regulation, poor industry development, or over-saturation of potential employees.  
• Regions need to have the flexibility of identifying Hot Jobs in their area. |
| Student recruitment efforts include information about Hot Jobs fields | • Surveys  
• Information on guest speakers  
• Economic data  
• Registration artifacts  
• EXPLORE/PLAN/ACT data  
• CFNC (Interest Inventory)  
• Information on job shadowing, internships, apprenticeships | • Recruitment at the cluster level should be at the Hot Jobs level but due to the size of the school course offerings cannot also correspond to the Hot Jobs.  
• Aside from paperwork, posters, and enrollment trends, we are not sure there is an effective measure. It also depends on whether the recruitment refers to recruitment for jobs, courses, programs, etc. May need to specify the type of recruitment that is being suggested. |

\(^1\) The Labor and Economic Analysis Division of the North Carolina Department of Commerce analyzed more than 700 North Carolina occupations to derive those with the most promising opportunities for the state’s workforce through the year 2020. The selection of Hot Jobs is based on a combination of measures such as average annual wages and projected number of new jobs. For information on Hot Jobs, see http://www.nccommerce.com/lead/hot-jobs.
Summary Ideas and Next Steps

- The reviewers expressed concerns about focusing these metrics on Hot Jobs and felt that metrics addressing employer engagement would need to address locally important industries, even if not in a Hot Job field, as well.
- Employer/industry engagement metrics may need to reflect regional variations and local workforce data in addition to statewide trends and Hot Jobs fields.

Curriculum and Program Design

The final topic area that the meeting participants reviewed was curriculum and program design. As noted earlier, the candidate metrics in this category are mostly qualitative and require descriptive information on program features.
Exhibit 9. Topic area: Curriculum and program design

<table>
<thead>
<tr>
<th>Candidate metrics</th>
<th>Suggested data sources</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Local courses are aligned with the knowledge and skills needed by industry | • Advisory council survey/evaluation  
• Business and industry input  
• Graduates employed in industry and/or related industry  
• Course blueprints  
• Moodle  
• Curriculum guides  
• Third-party vendors  
• Industry certifications/credentials | • Are local courses speaking about local course options only, or is it referring to [career and technical education] CTE courses in NC?  
• Career clusters and pathways.  
• Strong, valid indicator.  
• Scripted criteria.  
• Comparing industry needs to LEA Needs and vice versa.  
• Compare concentrator status needs and industry credential needs. |
| Program has a documented grade 9–14 pathway or program of study that can be shared with students and parents | • Look at pathway documents that have been created  
• State pathway model  
• CCP  
• NCVPS | • Some (but not all) programs have a Pathway to Prosperity for grades 9–14.  
• A strong effort needs to be made to share information with students, parents, and stakeholders. Sharing of this information should occur early in process. Persuasive with parents.  
• Need some leeway in grades - maybe start with middle school and not expand so far into College/Community College - depends on individual LEA resources. |
| Other metrics | • Co-op, internships, apprenticeships, job shadowing, virtual job shadowing  
• Registration data  
• Post-assessment data  
• Concentrator data | |

**Summary Ideas and Next Steps**

- Reviewers suggested a variety of data sources for these metrics, including business and industry input, course blueprints, and state pathways models.

- Given the diversity of potential data sources for this topic area, tracking the creation of programs of study that span education levels and connect with employment may be a good place to start.
Conclusions and Next Steps

The activities described in this report identified a set of potential metrics for developing a user-friendly toolkit for reviewing secondary CTE programs. The following suggestions for next steps build on the information collected in February and March meetings and provide options for collecting additional information and maintaining the engagement of local program staff. To this end, DPI might consider establishing an informal and volunteer advisory group comprised of rotating stakeholder representatives to provide input as the toolkit development process continues. An iterative process of revision and feedback would contribute additional content ideas but also engage local stakeholders in the process and increase their understanding of the purpose of this effort.

• **Develop a final list of performance metrics and identify priorities:** The feedback from the Spring Conference suggested changes and additions to the proposed metrics. Many of the ideas offered refinements that might make the metrics a better fit for local needs. As a next step, the DPI might review the suggestions and adjust the proposed metrics as needed to create a final list for a second review by district CTE stakeholders. This step may not be necessary if DPI staff feel that the resulting metrics are ready to be piloted. However, most of the Spring Conference participants reviewed the metrics for the first time at the meeting and may provide new ideas in a second round. Another review might also ask stakeholders to prioritize the metrics by identifying those that they feel to be the best measures of quality programs.

• **Fill in metric gaps:** Although the topic areas and candidate metrics considered from January to March 2015 reflect the topics found in other states’ CTE program review materials, additional topic areas and metrics may be of interest in North Carolina. The Spring Conference feedback offered suggestions for additional metrics, such as student and parent satisfaction, which might be worth exploring. In addition, the reviewers did not address candidate metrics related to instructional staff (e.g., teacher qualifications and professional development) and instructional practices (e.g., the integration of academic and technical content or hands-on exercises). The following steps might assist in addressing any gaps:

  • **Collect input from partnering postsecondary faculty:** Postsecondary instructors might generate metrics that promote the development of programs that span the secondary and postsecondary levels and include rigorous, non-duplicative coursework, as well as provide insights regarding the tracking of the postsecondary credits students earn in high school.
Consult academic faculty: Teachers in non-CTE program areas, such as math and language arts or English, may have suggestions for metrics and data sources to track CTE students’ academic skills.

Engage other CTE stakeholders: Consider metrics related to other key CTE program stakeholders, such as parents (e.g., their engagement or satisfaction with their children’s programs) or counselors’ (e.g., their level of knowledge, professional development in CTE, and engagement with programs).

Performance metric prioritization: The March 2 meeting generated ideas for metric data sources, metric refinements, and new ideas for metrics in addition to the candidate metrics provided. A next step might be to ask either the advisory group or larger group to select the two or three metrics in each topic area

Identify targets: Once a set of metrics has been selected, DPI should develop targets or benchmarks for analyzing and interpreting the data collection and to help districts identify areas in need of improvement. The reviewers’ comments indicate that districts and CTE programs vary in their access to resources, such as employer partners and industry-recognized technical skill assessments. Small districts or districts in rural and economically disadvantaged areas, for example, struggle to find employer partners or to afford access to technical skill assessments. To address district diversity, the toolkit might do the following:

Set percentage improvement targets based on an initial year or two of data: This approach mirrors that of the Perkins accountability system and allows targets to reflect districts’ baseline data or starting points. For example, a district in which one half of students earned a career endorsement for their high school diploma might seek to increase the percentage earning this credential to 55 percent over the next year.

Work with state-level data analysts to set appropriate benchmarks: State data specialists may be able to provide appropriate benchmarks for different types of schools. For example, college-going rates may differ between urban, suburban, and rural districts, and realistic targets may need to reflect those variations.

Data Specialist Input: Once DPI has selected a final list of toolkit metrics, district data specialists might provide guidance on accessing, recording, analyzing, and reporting the metric data. The guidance could identify appropriate data sources, suggestions for recording the data in a worksheet or Excel Workbook, ideas for simple analyses that districts can conduct themselves, and strategies for verifying data accuracy. For example, data specialists might be able to describe the data system el-
ements that record CTE participant and concentrator data and how to access the information in PowerSchool. Data specialists may have templates for disaggregating data by race/ethnicity or gender and recommend benchmarks, such as past-year reports or state-level data, for benchmarks and verification. RTI anticipates that data specialists may be most able to assist with the management of quantitative data; they may also, however, assist program specialists to devise strategies for the consistent collection of qualitative data as well.
Appendix A: Webinar and Meeting Presentations

CTE Advisory Group Presentation, February 19, 2015

CTE Program Evaluation Measure Candidates

Sandra Staklis
Senior Research Associate
February 19, 2015
Process

- Reviewed North Carolina CTE program evaluation materials and reports
- Reviewed CTE program evaluation materials from fifteen states
- Selected examples from seven states most relevant to North Carolina
- Initial list of candidate measures reviewed by CTE staff at the North Carolina Department of Public Instruction

Measures

- Process measures: “Conduct ongoing analysis of economic and workforce trends to identify regional POS to be created, expanded, or discontinued.
- Qualitative measures: “How do teachers involve business and industry in your program (provide examples)?”
- Quantitative measures: “Proportion of students participating in experiential learning opportunities (lab work, co-ops, simulated workplace, mentorships, internships, pre-apprenticeships, apprenticeships).”
Measures

- **Process measures:** “Conduct ongoing analysis of economic and workforce trends to identify regional POS to be created, expanded, or discontinued.”
- **Qualitative measures:** “How do teachers involve business and industry in your program (provide examples)?”
- **Quantitative measures:** “Proportion of students participating in experiential learning opportunities (lab work, co-ops, simulated workplace, mentorships, internships, pre-apprenticeships, apprenticeships).”

Questions for the candidate measures

- Is the measure of interest? Does it provide useful information for understanding and improving programs?
- **What data** might be used for this measure?
- Are these data accessible for CTE program evaluation activities?
- How often should information and data be collected?
Student Engagement

- Number of participants
- Number of concentrators
- Proportion of participants/concentrators
- Proportion of underrepresented students (nontraditional by gender, underrepresented racial/ethnic groups)
- Proportion of concentrators participating in CTSOs
- Proportion of concentrators engaging in experiential learning opportunities

Facilities and Equipment

- Equipment is up-to-date and meets current industry standards
- Equipment is in good working order and meets safety requirements
- Adequate classroom and/or workshop space is available
Student Assessment

- Proportion of concentrators earning the National Career Readiness Certification (NCRC)
- Proportion of concentrators attempting a credential
- Of those attempting, proportion earning a credential
- Student performance on end-of-course examinations (if available)

Counseling and Guidance

- Student participation in guidance activities
  - career exploration exercises
  - visits with area employers
  - career fairs
  - creation of career or graduation plans
  - regular updates to graduation plans
Curriculum and Program Design

- Course standards are aligned with the knowledge and skills needed by industry
- Program has a documented grade 9 to 14 pathway or program of study that can be shared with students and parents

High School Completion

- Proportion of concentrators earning a high school diploma in 4 years (“on time” graduation)
- Proportion of concentrators earning a Career Endorsement on their high school diploma
- Proportion of CTE concentrators earning other high school diploma endorsements (College or Academic Scholars)
Instructors

- Proportion of instructors certified in their teaching field
- Proportion of instructors with industry-recognized certifications or credentials relevant to their teaching fields

Postsecondary Preparation

- Proportion of concentrators attempting to earn postsecondary credits in CTE (or other) fields
- Proportion of concentrators earning any postsecondary credits in high school
- Proportion of students earning postsecondary credits in high school in CTE fields
Postsecondary Preparation (continued)

- Proportion of concentrators earning community college certificates in a CTE field
- Proportion of concentrators who enroll in a public institution of higher education who require developmental/remedial education
- Proportion of concentrators who enrolled in a postsecondary institution within a year of high school graduation

Connections with Business and Industry

- Advisory council members represent employers in state or regional "hot jobs" fields
- Program is aligned with "hot jobs" fields (e.g., courses and topics reflect employer needs in these fields)
- Student recruitment efforts include information about "hot jobs" fields
Contact information

Sandra Staklis
Senior Research Associate
503.428.5676
sstaklis@rti.org
Candidate Measures for CTE Program Evaluation

Sandra Staklis
Senior Research Associate
March 2, 2015

Process

- Reviewed North Carolina CTE program evaluation materials and reports
- Reviewed similar materials from 15 states
- Selected examples from seven states most relevant to North Carolina
- Initial list of candidate measures reviewed by CTE staff at the North Carolina Department of Public Instruction
- Draft list reviewed during the CTE Advisory Group webinar in February
Measures

- **Process measures:** “Conduct ongoing analysis of economic and workforce trends to identify regional POS to be created, expanded, or discontinued.
- **Qualitative measures:** “How do teachers involve business and industry in your program (provide examples)?”
- **Quantitative measures:** “Proportion of students participating in experiential learning opportunities (lab work, co-ops, simulated workplace, mentorships, internships, pre-apprenticeships, apprenticeships).”
Measures

- **Process measures**: “Conduct ongoing analysis of economic and workforce trends to identify regional POS to be created, expanded, or discontinued.

- **Qualitative measures**: “How do teachers involve business and industry in your program (provide examples)?”

- **Quantitative measures**: “Proportion of students participating in experiential learning opportunities (lab work, co-ops, simulated workplace, mentorships, internships, pre-apprenticeships, apprenticeships).”

Questions for the candidate measures

- **Is the measure of interest?** Does it provide useful information for understanding and improving programs?

- **What data** might be used for this measure?

- **Are these data accessible** for CTE program evaluation activities?

- **How often** should information and data be collected?
Student Engagement

- Number of participants
- Number of concentrators
- Proportion of CTE concentrators among all graduates
- Proportion of CTE enrollments from underrepresented groups (nontraditional by gender, race/ethnicity)
- Proportion of CTE enrollments participating in CTSOs
- Proportion of CTE enrollments engaging in experiential learning opportunities

Facilities and Equipment

- Equipment meets CTE program guidelines
- Equipment meets safety requirements and is in good working order
- Equipment is up to date and relevant to current industry standards
- Adequate classroom and/or workshop space is available
- Instructional facilities are clean, well-organized, and conducive to learning
Student Assessment

- Proportion of concentrators earning certifications through the National Career Readiness Certification (NCRC)
- Proportion of CTE enrollments attempting an industry-recognized credential (among those with a credential available)
- Among CTE enrollees who attempt a credential, proportion who earn a credential

Career Development

- Student participation in:
  - online virtual tours
  - mentoring relationships
  - work with Pathways to Prosperity
  - visits with area employers
  - career fairs
  - creation and updates of career & graduation plans
High School Completion

- Proportion of concentrators earning a high school diploma in 4 years (“on time” graduation)
- Proportion of concentrators earning a career diploma endorsement
- Proportion of concentrators earning a college or college UNC diploma endorsement
- Proportion of CTE concentrators earning both career and college endorsements

Postsecondary Preparation

- Proportion of concentrators enrolling in courses that offer postsecondary credit
- Proportion of concentrators earning Career and College Promise credits
- Proportion of concentrators earning articulated credits
- Proportion of concentrators earning postsecondary credits in CTE fields
Postsecondary Preparation (continued)

- Proportion of concentrators who enroll in a postsecondary institution within a year of high school graduation
- Proportion of the above who require developmental/remedial education (public institution attendees only)

Connections with Business and Industry

- Advisory council members represent employers in state or regional "hot jobs" fields
- Program is aligned with "hot jobs" fields (e.g., courses and topics reflect employer needs in these fields)
- Student recruitment efforts include information about "hot jobs" fields

http://www.nccommerce.com/lead/hot-jobs
Curriculum and Program Design

- Local courses are aligned with the knowledge and skills needed by industry
- Program has a documented grade 9 to 14 pathway or program of study that can be shared with students and parents

Instructors

- Proportion of instructors certified in their teaching field
- Proportion of instructors with industry-recognized certifications relevant to their teaching field
- Professional development
Contact information

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