Supplemental Student Learning Objective Development Guide: Teachers of Career and Technical Education Courses

April 2015

Teachers of Career-Technical Education Courses

Teachers of career and technical education (CTE) courses play a critical role to ensure students graduate ready for college and career. With 94 percent of high school students earning at least one CTE credit prior to graduation (Association for Career and Technical Education, n.d., 2014), teachers of CTE have an important impact. To their credit, teachers of CTE courses work to support some of the fastest growing fields (e.g., health care, marketing, and information technology) (Carnevale, Smith, & Strohl, 2010, 2013).

It is critical that teachers of CTE courses challenge all students to grow throughout the CTE program. Students taking CTE courses must grow in a variety of ways: They should gain content knowledge, demonstrate new skills, and explore unique career paths. Some students begin CTE programs equipped with knowledge and skills in a specific industry or field, whereas others begin with limited experience but a strong interest. Student learning objectives (SLOs) can help teachers of CTE courses systematically identify and address student needs across a wide spectrum of experience, knowledge, skill, and performance. Teachers of CTE courses can apply the SLO process to set individualized, challenging, and attainable growth expectations for all students. They then can align those expectations to their course content and overall student learning goals.

Although setting growth expectations through SLOs can help teachers of CTE courses challenge their students, measuring students' growth may be difficult because of the limited availability of appropriate measures or assessments. Outcomes such as industry certification attainment and matriculation to postsecondary institutions are meaningful measures of CTE program quality but may be limited as a student growth measure for educator evaluation purposes.[1] Likewise, a teacher of a CTE course may be challenged to identify an appropriate assessment that fully captures the standards and expectations required by the course. Teachers of CTE courses may need to find multiple assessments to capture important student growth and achievement outcomes. Given these challenges, this document highlights considerations, guiding questions, strategies, SLO samples, and additional resources to aid teachers of CTE courses in writing high-quality SLOs.

---

[1] Industry certifications are created and administered by third-party testing agencies and do not include a pretest or measure baseline data —elements that are critical for an SLO. Teachers, local and state education agencies, and other education organizations are limited in their ability to create pretests for industry certifications because the tests and the test data are owned by the testing agencies.

This guide is one of a series of five supplemental guides provided for local education agencies and teachers of specialty groups of students to support the implementation of SLOs.

Developmental guides are provided for the following teacher groups:

- Teachers of students with disabilities
- Teachers of English language learners
- Teachers of preschool programs and kindergarten
- Teachers of CTE courses
- Teachers of gifted students

Considerations

Teachers of CTE courses experience specific contextual factors that influence their ability to measure student growth. The following section describes some of these factors and identifies specific considerations associated with measuring student growth in CTE courses. The considerations are organized according to the sections of the Ohio Department of Education (ODE) Template Checklist for Writing and Approving Student Learning Objectives.

Baseline and Trend Data

- **SLOs should be based on baseline and trend data identified by the teacher of the CTE course, CTE administrators, and district leaders.** The availability of baseline and trend data for teachers of CTE courses may depend on the focus of the specific SLOs and which assessments are included in the SLO. Teachers of CTE courses may need to locate and compile baseline and trend data from multiple sources, including district and teacher records of student learning, as guides for setting growth targets for the SLO. Teachers of CTE courses should work with district leaders to determine what types of data are available, including classroom assessment data, district assessment data, grades, attendance, enrollment as a CTE concentrator,[2] and performance on state academic assessments. Teachers of CTE courses may also need to request additional time and guidance from district leaders to accurately gather available baseline and trend data, especially if it must be gathered from multiple sources or requested from specific people or departments.

- **SLOs should include growth targets that are informed by trend data and postprogram placement data (when available).** Although it is not possible to include

---

[2] The Office of Career, Technical, and Adult Education defines a secondary CTE concentrator as "a secondary student who has earned three (3) or more credits in a single CTE program area (e.g., health care or business services), or two (2) credits in a single CTE program area, but only in those program areas where 2 credit sequences at the secondary level are recognized by the State and/or its local eligible recipients." In short, CTE concentrators are students who plan to graduate with a CTE concentration by completing all required secondary-level courses in a pathway or program (Perkins Collaborative Resource Network, 2007, p. 1).

postprogram placement data in the SLO because it is gathered after graduation, teachers of CTE courses may analyze the relationship between postprogram placement data and other trend data, such as course grades, CTE assessment data, and academic assessment data, to determine how trend data may predict students' success after graduation and what the implications are for setting growth targets. Teachers of CTE courses should work with district leaders to ensure that they have access to these data and guidance or training on how to use these data in tandem with other trend data to inform setting growth targets.

Assessments

- **The assessments chosen for the SLOs should be clearly aligned to the standards, content, and intended student outcomes for the CTE course.** If the CTE course includes a significant amount of instruction on academic concepts and skills, it may be appropriate for the SLO to use a relevant academic assessment. For example, a teacher of an architecture course that also includes a significant amount of instruction on geometry (or that includes academic credit for a geometry course) may write an SLO that includes an assessment of students' geometry knowledge as well as an assessment of students' architecture knowledge and skill development. If the CTE course primarily focuses on content knowledge and skill development for a specific career cluster or pathway,[3] the SLO *should not* use academic assessments (such as state reading and mathematics exams) to measure student growth. Rather, the assessments chosen for the SLO should reflect students' growth in the relevant content knowledge and skills covered in the course. For example, a teacher of an audiovisual technology course may choose an end-of-course examination as the assessment for his or her SLO because it aligns with the content and standards taught over the interval of instruction. Teachers of CTE courses should work with district leaders to determine whether any existing assessments are aligned to the course content and standards and meet the state and district criteria for validity and reliability. If there are existing assessments that meet these criteria, teachers of CTE courses may also need to work with district leaders to ensure that there are appropriate preassessments available or create preassessments. The content included in preassessments should closely mirror the postassessment in terms of content covered, scope and breadth of questions or tasks, and scoring range and methodology.

  - **SLOs may use end-of-course exams, Ohio Career Technical Competency Assessments, or industry assessments to measure growth.** If the district has an existing end-of-course examination for the CTE course or course sequence that is administered prior to May 1, this examination may be used in the SLO in tandem with a district-developed preassessment. If the end-of-course examination falls at the end of a course sequence, teachers of CTE courses may work with the district to determine proficiency score ranges on the examination for each of the courses in the sequence. For example, teachers of prerequisite health informatics courses may administer the end-of-course examination, typically taken by high school seniors during their final course in a health informatics pathway, and use this assessment to

---

[3] The National Career Clusters Framework organizes CTE subject and industry areas into 16 career clusters. Together, these career clusters include more than 79 pathways, or course sequences, across secondary and postsecondary courses that prepare students for careers and further study in specific subjects or industries.

measure student growth. To use this assessment data in SLOs, teachers of CTE courses should work with district leaders to determine what score range would be considered proficient on the examination for each of the prerequisite courses. Teachers of CTE courses would then set growth targets using this score range as a guide. If teachers of CTE courses use this approach and choose to use the same end-of-course examination as the assessment for all CTE courses in that course sequence, they may consider working with district leaders to create different versions of the examination to reduce students' familiarity with test items over time. Likewise, teachers of CTE courses should consider whether the number of test items on the exam related to each course's content is sufficient enough to ensure that the results are likely to be valid and reliable. It is important to note that this approach may not be used for the Ohio Career Technical Competency Assessments. For senior-level CTE courses, districts are able to administer the Ohio Career Technical Competency Assessments at the end of students' junior year as a preassessment for senior CTE courses. The Ohio Career Technical Competency Assessments may only be used to measure growth for senior-level CTE courses, however. If teachers of CTE courses do not have existing end-of-course exams that are suitable for measuring student growth for their CTE course(s), they may consider working with district leaders to purchase commercial industry assessments, which include pre- and postassessments. It is also important to note that data from the end-of-course examination(s) must be captured by May 1 to be available to use in SLOs.

- **SLOs may use items from curriculum-based unit tests as postassessment items.** If the district has existing unit tests based on the curriculum, items from these tests may be used to create pre- and postassessments or in tandem with district-developed preassessments. For example, teachers of CTE courses may select key items from each of the course's unit tests to comprise a pre- and postassessment that reflects the broader content of the course. Teachers of CTE courses can ensure that this assessment meets Ohio's quality criteria by enlisting support from the district or school assessment specialist to review and approve the assessment.

- **Teachers of CTE courses may consider writing SLOs that include multiple assessments depending on the context and content of the course or multiple SLOs based on different assessments for different groups of students.** CTE courses require students to both gain content knowledge and the ability to perform skills in practice. Teachers of CTE courses may consider writing an SLO that includes multiple assessments to capture growth in both content knowledge and practical skills. Likewise, the most meaningful outcomes in some CTE courses may be based on student achievement, such as earning industry credentials. Teachers of CTE courses may also consider including an additional SLO that focuses on students' movement toward achievement of industry credentials. SLOs based on the development of specific skills or earning credentials may cover all students in the course or may focus specifically on CTE concentrators.

  - **SLOs may be based on student growth toward industry credential attainment.** In many CTE courses—especially those targeted to older high school students—industry credential attainment is one of the most important student outcomes for the course. Industry credential attainment is a clear indicator of students' knowledge and skill

development and career readiness. Teachers of CTE courses may write an SLO that captures their goal for the number or type of industry credentials earned by each student or group of students. These goals should be based on trend data from prior students' industry credential attainment. Because data on industry credential attainment usually belongs to individual students and the testing agency, teachers of CTE courses may consider working with district leaders to create processes to ensure that these data are available to teachers for their SLO. If the design of the CTE course or pathway does not fully prepare students to attain the relevant industry credential during the course covered by the SLO, the postprogram outcome data on industry credential attainment may be used as trend data for the SLO.

- **SLOs may be based on student growth in practical skill development, measured by performance rubrics or similar assessments of on-demand or extended performance tasks.** Nearly all CTE courses focus on technical knowledge and skill development and students' abilities to perform tasks successfully. Teachers of CTE courses may write a SLO that focuses on students' skill development by choosing a performance rubric or similar assessment as a pre- and postassessment for the SLO. Performance rubrics are typically created by a teacher in tandem with district leaders or specialists and administered by the teacher in the classroom. These rubrics may be used to gather information on students' progress at multiple points during the course. For example, a teacher of a CTE course may use a rubric to determine the extent to which a student correctly responds to and executes an emergency protocol at the beginning, middle, and end of the course. A teacher of a CTE course may use rubrics in a similar manner to determine student growth through project-based learning. Teachers of CTE courses may also use rubrics to assess student growth through portfolios that demonstrate a series of completed student projects.

- **SLOs may be based on student growth in CTE content knowledge, academic content knowledge, or both.** If the CTE course primarily focuses on CTE content knowledge and skill development, the SLO assessment should align to the CTE content to reliably measure student growth. However, if the CTE course is designed to include direct instruction on new academic content or academic content being concurrently taught in the students' other classes, the teacher of the CTE course may consider writing an SLO based on students' growth in relevant academic content knowledge. Teachers of CTE courses may choose the same assessments used in the relevant academic teachers' SLOs to measure student growth to ensure fairness and prevent overtesting students. If the teacher of the CTE course team-teaches or collaboratively plans content with a teacher of an academic course, the district and teachers should determine the extent to which each teacher is responsible for student growth in academic and CTE content knowledge and skills. Because most CTE courses address some of Ohio's Learning Standards focused on writing, reading, and mathematics, these standards should be included in the SLO.

SLO Ratings

- **SLOs that include multiple assessments for each teacher of a CTE course should include a summative scoring methodology to determine the teacher's success in helping students achieve their growth targets.** Teachers of CTE courses who develop

SLOs based on multiple assessments will need to develop a summative scoring methodology in arriving at a final growth score for each student, which should be included in the SLO. Ideally, the assessments would be developed in collaboration with other teachers and weighed equally or unequally to give more weight to certain assessments (such as weighting district-created assessments higher than teacher-created assessments). The CTE teacher or the district may also choose to use a matrix method for creating a summative score instead of assigning weights. For more information on these summative scoring methodologies, see Leo and Lachlan-Haché (2012).

Guiding Questions for District Leaders: Providing Guidance and Supports to Teachers of CTE Courses

These guiding questions will help district leaders determine rules and guidance for ensuring that the SLO process is fair and rigorous for teachers of CTE courses.

- What CTE courses and programs are offered in your district?

  - What are the current CTE student outcomes that your district tracks and reports? Are there any outcomes that your district is targeting for improvement?

  - Are any of these courses or programs taught by multiple teachers? If so, what kinds of teaching arrangements are in place?

- What are the existing assessments being used in CTE classrooms (for either grading or accountability purposes) for each of these CTE courses? These could include assessments such as unit assessments, end-of-course assessments, or performance rubrics that can be used to measure student growth in CTE content knowledge or skill development.

  - What standards and course content do these assessments cover? Are there standards or content covered in the course that are not covered by these assessments? Is performance on those standards or content measured through informal or classroom-based assessments?

  - How do these assessments align with national standards and organizing principles from professional organizations, such as the Common Career Technical Core and Career Clusters Framework?

- How are the assessments designed? Can they serve as both the pre- and postassessment? If not, do preassessments need to be created for these assessments?

- How do the assessments demonstrate sufficient validity and reliability to be used in SLOs?

- Thinking about assessment selection, administration, and scoring, what guidelines will you provide to teachers of CTE courses on using the following assessments in SLOs:

  - Academic assessments

  - End-of-course exams

  - Unit tests

  - Technical skills assessments

  - Performance rubrics

- In what kind of data collection and analysis do teachers of CTE courses in your district regularly participate? How does your district train the teachers in this area?

- Are baseline data, trend data, and postprogram participation data readily available to teachers? Does the district or school leadership provide any analysis or context for this data? Does the district or school leadership provide training or guidance to teachers on how to use this data to inform growth targets?

Strategies

The following strategies present various approaches to writing SLOs based on the context in which the teacher of CTE courses works:

Strategy 1: Write an SLO based on multiple assessments. Because teachers of CTE courses may use several different assessments to measure student growth across all content standards covered in the course, these teachers may write an SLO based on multiple assessments. In this scenario, the teacher of the CTE course may use CTE content knowledge assessments, performance rubrics, or academic assessments in tandem to assess students' growth. The teacher of the CTE course must compile and analyze baseline and trend data, set growth targets, and write a rationale for each assessment, then determine how they will combine the assessments to determine a final growth score. For example, teachers of automotive mechanics courses may include two types of assessments in their SLOs: a written end-of-course examination (with a similar preassessment) measuring student growth in knowledge about automotive mechanics and a performance rubric measuring students' growth in skill in building and repairing automotive engines.

Strategy 2: Write a SLO with growth targets focused on moving students toward proficiency in attaining industry credentials or participating in internships. CTE teachers can choose to write one of their SLOs with rigorous growth targets that are focused on content that moves students toward proficiency in attaining industry credentials. This allows teachers of CTE courses to align the student outcomes in their evaluation to the student outcomes included in CTE program reporting or other key program outcomes.

Career and Technical Education Sample SLOs

Grade 11 SLO on Automotive Technology: This sample SLO from the Ohio Department of Education is based on an Automotive Technology I course for Grade 11.

Grades 11–12 SLO on Natural Resources and Production: This sample SLO from the Hawaii Department of Education is based on a Natural Resources Production course within the Agriculture program.

Grade 11 SLO on Hospitality: This sample SLO from the Hawaii Department of Education is based on a hospitality course for Grade 11.

Grade 11 SLO on Health Services: This sample SLO from the Hawaii Department of Education is based on a Health Services course for grade 11.

Grade 9 SLO on Technology: This sample SLO from the Maryland Department of Education is based on a Foundations of Technology course within the STEM (Science, Technology, Engineering, and Mathematics) program.

Grade 10 SLO on Cosmetology: This sample SLO from the Maryland Department of Education is based on a Cosmetology course within the Human Services program.

Grades 9–12 SLO on Business: This sample SLO from the New York State Department of Education is based on a Principles of Business course within the Business Management and Administration program.

Grades 11–12 SLO on Finance: This sample SLO from the New York State Department of Education is based on a Math in Finance course within the Finance program.

Grades 11–12 SLO on Law Enforcement: This sample SLO from the New York State Department of Education is based on a Law Enforcement 1 course within the Law, Public Safety, Corrections and Security program.

Grades 9–12 SLO on Computer Applications: This sample SLO from the New York State Department of Education is based on a Computer Applications course within the Information Technology program.

Grades 9–12 SLO on Building Trades: This sample SLO from the New York State Department of Education is based on a Building Trades 1 course within the Architecture and Construction program.

Grades 10–11 SLO on Culinary Arts: This sample SLO from the Rhode Island Department of Education is based on a Culinary Arts 2 course within the Hospitality and Tourism program.

Grade 12 SLO on Robotics: This sample SLO from the Rhode Island Department of Education is based on an Electrical, Robotics, and Pre-Engineering course within the STEM program.

References and Additional Resources

Association for Career and Technical Education. (n.d.). *CTE today fact sheet.* Retrieved from
http://www.acteonline.org/WorkArea/DownloadAsset.aspx?id=1909

Association for Career and Technical Education. (2014). *CTE prepares the qualified workforce.*
Retrieved from https://www.acteonline.org/general.aspx?id=5748#.U9Evx_ldV8E

Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and education
requirements through 2018.* Washington, DC: Georgetown University, Center on
Education and the Workforce. Retrieved from
http://scs.georgetown.edu/departments/5/center-for-continuing-and-professional-
education/news/1052/report-recovery-2020-job-growth-and-education-requirements-
through-2020

Carnevale, A. P., Smith, N., & Strohl, J. (2013). *Recovery: Job growth and education
requirements through 2020.* Washington, DC: Georgetown University, Center on
Education and the Workforce. Retrieved from
http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/Recovery2020.FR.Web.pdf

Center on Great Teachers and Leaders. (2014). *21st century educators: How states are
promoting career and technical educator effectiveness* [Webinar]. Retrieved from
http://www.gtlcenter.org/products-resources/supporting-21st-century-educators-how-
states-are-promoting-career-and-technical

Jacques, C. (2014, May). Do your evaluations make you a better career and technical education
teacher? *Techniques,* 37–40. Retrieved from
http://www.gtlcenter.org/sites/default/files/Evaluations_Career_Technical_Education_Te
achers.pdf

Jacques, C. (2014). *Ask the team: Credit quandaries*. Washington, DC: Center on Great Teachers
and Leaders. Retrieved from
http://www.gtlcenter.org/sites/default/files/Credit_Quandaries.pdf

Jacques, C., & Potemski, A. (2014). *21st century educators: Developing and supporting great
career and technical education teachers*. Washington, DC: Center on Great Teachers and
Leaders. Retrieved from
http://www.gtlcenter.org/sites/default/files/21CenturyEducators.pdf

Leo, S. F., & Lachlan-Haché, L. (2012). *Creating summative educator effectiveness scores:
Approaches to combining measures.* Washington, DC: American Institutes for Research.
Retrieved from
http://educatortalent.org/inc/docs/Creating%20Summative%20EE%20Scores_FINAL.PD
F

Ohio Department of Education. (n.d.a). *Local measures*. Retrieved from
http://education.ohio.gov/Topics/Teaching/Educator-Evaluation-System/Ohio-s-Teacher-
Evaluation-System/Student-Growth-Measures/Student-Learning-Objective-Examples

Ohio Department of Education. (n.d.b). *Understanding Ohio's new career-technical education report card.* Retrieved from http://education.ohio.gov/getattachment/Topics/Career-Tech/CTE-Performance-Data-and-Accountability/Career-Technical-Education-Report-Card/Understanding-Ohios-New-CTE-Report-Card1.pdf.aspx

Ohio Department of Education. (2014). *Ohio career-technical education dictionary.* Retrieved from https://education.ohio.gov/getattachment/Topics/Career-Tech/CTEDictionaryAug-122014Version.pdf.aspx

United States Department of Education. (2007). *Student definitions and measurement approaches for the core indicators of performance under the Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV).* Washington, DC: Office of Vocational and Adult Education. Retrieved from https://s3.amazonaws.com/PCRN/docs/nonregulatory/studentdef.pdf