Recommended Updates to the Alaska Career and Technical Education Portal
Technical Assistance to States: Final Report
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Jon Boyette
jboyette@rti.org
Laura Rasmussen Foster
lrasmussen@rti.org

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The Office of Career, Adult, and Technical Education (OCTAE) provides technical assistance (TA) each year to state and local career and technical education (CTE) leaders through the TA to States initiative. The TA helps states meet accountability requirements under the *Strengthening Career and Technical Education for the 21st Century Act (Perkins V)* and supports state and local CTE providers in using data to improve student and program outcomes.

Between October 2020 and May 2021, researchers at RTI International (the “TA team”) worked with Alaska Department of Education and Early Development (DEED) staff to develop recommendations on upgrades to DEED’s CTE portal to

- enhance portal usability, and
- add functionality to improve local CTE providers’ access to student and program information.

DEED staff who participated in the TA included Brad Billings, CTE Administrator; Sheila Box, CTE Program Specialist; Felicia Swanson, Education Associate; and Bjorn Wolter, CTE Program Specialist.
The TA team conducted the following activities:

- Review of publicly available CTE and education data dashboards from other states

- Development of presentation materials and facilitation of a session during DEED’s CTE Spring Conference to gather feedback from CTE providers

- An evaluation of the CTE Portal against eight principles of user-centered website design (i.e., “the heuristic review”)
  - This review includes examples related to the four recommendations for the portal developed through the review. The review results were provided to DEED as a companion to this report.
This report is organized into two main sections:

• **Design recommendations**
  • To improve the usability and ease of navigation of the CTE portal
  • Based primarily on the heuristic review

• **Content recommendations**
  • Features to assist local CTE providers in accessing information on student performance and CTE programs
  • Based primarily on feedback gathered during the CTE Spring Meeting and informed by a review of data dashboards in other states
SECTION 1: DESIGN RECOMMENDATIONS
COMPONENTS OF A HEURISTIC REVIEW

- **Visibility of system status** Users are made aware of what the system is doing

- **Match between the system and real world** Website uses language familiar to the user

- **User control and freedom** User is free to select and sequence tasks, can back out of functions if needed, can undo/redo work

- **Consistency and standards** Words or user actions have consistent meanings/outcomes across the site

- **Recognition rather than recall** Objects, actions, and options are visible—user does not have to remember information from earlier in the dialogue to choose a desired option

- **Aesthetic and minimalist design** Dialogues provide minimum information needed to perform a task

- **Error prevention** Site is designed to minimize the possibility of errors

- **Flexibility and efficiency of use** Additional functionality can speed up interactions for the expert user without affecting novice users*

- **Help users recognize, diagnose, and recover from errors** Error messages are in plain language, precisely describe problem, and suggest solution

- **Help and documentation** Help documents are clearly organized, easy to search, focused on the user’s task, and include a limited number of concrete actions for the user*

*The heuristic is less relevant to DEED’s interests and TA needs and excluded from the review.
The heuristic review resulted in four recommendations for improving the usability of the CTE portal:

• **Implement breadcrumbs and other navigational clues** to communicate to the user where they are within the system.

• **Update content design** to improve readability and lead the eye down the page.

• Implement constraints to form fields, default values, and character values where necessary to **prevent input errors**.

• **Update error messages and functionality** to render error messages clear and concise and assist the user in resolving errors.
DESIGN RECOMMENDATION #1

Breadcrumbs are currently included on the main DEED website (see figure at right), though not in the CTE Portal itself.

Including breadcrumbs within the CTE Portal would help users to find the pages they need to accomplish specific tasks (e.g., student data upload, data reports and visualizations) and return to the pages later.

Recommendation

Implement breadcrumbs and other navigational clues to communicate to the user where they are within the system.
DESIGN RECOMMENDATION #2

Consistent rules for font color and size, capitalization, and punctuation would help users in interpreting the website and identifying the most important information on a page. In the example at right, it is not immediately clear what is the most important information on the page.

Recommendation

Update content design to improve readability and lead the eye down the page.

- Adopt a standard template and layout for pages within the CTE Portal, with similar
  - formatting for page titles,
  - locations for data entry fields,
  - styling and usage for heading tags,
  - styling and functions for buttons, and
  - table styles.
DESIGN RECOMMENDATION #3

Indicating which forms and user input fields are required before the submitter uses the form can save the user time and the need to submit a form multiple times.

- Example: The “Inserting New Course” dialogue does not currently flag errors until the user tries to submit a completed form.

Allowing forms and field inputs to accept only values that match formatting requirements can prevent data entry errors.

- Example: The “Date of Dual Enrollment” field currently allows the user to enter letters. It should only allow characters that fit its formatting requirements and should communicate the format users should input (e.g., 12-28-2020 or 12/28/2020).

**Recommendation**

Implement constraints to form fields, default values, and character values where necessary to prevent input errors.

- Indicate which fields are required before the user submits a form.
- Provide error feedback instantly when a user enters incorrectly formatted data.
- Implement form constraints to prevent users from entering incorrect data in the first place.
DESIGN RECOMMENDATION #4

Error messages should be clear, concise, and actionable.

• In the screenshot at right, there is no indication of why the field is red or how to resolve the error.
• An actionable error message might read, “The course number is too long. Please verify that you have the correct course number and enter it again.”

Recommendation

Update error messages and functionality to render error messages clear and concise and assist the user in resolving errors.

• Use concise error messages that suggest the cause of the problem and steps the user might take to resolve or avoid it.
SECTION 2: CONTENT RECOMMENDATIONS
CONTENT RECOMMENDATIONS

These recommendations are based on a review of data dashboards developed by other states and feedback from local providers during the CTE Spring Conference:

• Update Career and Technical Education Program of Study (CTEPS) application page to include the full program application

• Add meta-tags to programs and courses to classify them according to the job skills they teach

• Incorporate data visualizations to assist local CTE providers in accessing student, program, and labor market data
In meetings with the TA team, DEED staff noted that the full CTEPS application is not currently included on the CTE Portal. Local CTE providers may currently complete part of the application online but also must submit paperwork separately.

Staff also note that CTE courses or programs that are no longer offered are not automatically archived or flagged. As a result, DEED data analysts must manually identify and remove “dead” courses from course and program databases.

**Recommendation**

Update CTEPS application page to include the full program application.

- Add form fields for the second page of the CTEPS program application to the current web-based application.
- Develop functionality to flag or archive courses and programs that are not renewed during the program approval or renewal process.
DEED staff and local providers both noted a need for a searchable database of CTE programs and courses.

For example, local providers want a simple way to identify districts that offer courses that teach specific skills or content areas. Local providers would use that information to contact those districts for information or advice about those courses and programs of study.

**Recommendation**

Add meta-tags to programs and courses to classify them according to the job skills they teach. Consider using Classification of Instructional Programs (CIP) codes or clusters of Standard Occupational Classification (SOC) codes to classify courses and/or programs that teach certain workplace skills (more on next slide).
Using standard CIP-to-SOC crosswalks, tagging CTE programs with CIP codes would allow providers to both

- identify programs or courses offered in the state that are relevant to their interests, and
- connect CTE program offerings to occupation projections for the Comprehensive Local Needs Assessment.

**How it would work:**

1. User selects CTE course or program
2. Server call selects course or programs with the same CIP code, links to related SOC codes
3a. CIP codes are used to select related programs and/or courses from CTE course database
3b. SOC codes are used to select Department of Labor and Workforce Development occupation projections relevant to the CTE program
4. User receives information on which districts are teaching skills of interest to the user as well as occupations data relevant to those programs or courses
Participants in the CTE Spring Conference noted a desire for more user-friendly and intuitive data visualizations, including
- pie/donut charts,
- heat maps,
- scatter plots, and
- maps.

Recommendation

Incorporate data visualizations to assist local CTE providers in accessing student, program, and labor market data.

Format recommendations:
- Review data visualization examples from other states and select those that best communicate information DEED needs to share and local providers need to access.
- Consider and select software or data visualization libraries to build data visualizations. Open source or “freemium” options include Highcharts, D3 Libraries, and Leaflet (for mapping). Common paid or proprietary options include Tableau, Microsoft Power BI, and ArcGIS (for mapping).
Participants in the CTE Spring Conference indicated a need for postsecondary and employment outcomes for CTE students in their own programs and statewide for their own planning and to share with stakeholders, including school administrators, advisory board members, parents, state government, and business representatives.

Other topics of interest included CTE enrollment and participation and enrollment by cluster (see appendix for more detail).

**Recommendation**

Incorporate data visualizations to assist local CTE providers in accessing student, program, and labor market data. Present charts and other visualizations for student performance—student outcomes, trends in CTE enrollment and participation, and enrollment by cluster.
APPENDIX: EXAMPLE DATA DASHBOARDS

Maryland State Department of Education [CTE Data Dashboards](#)

Pittsburgh Public Schools [Industry-Recognized Credential Dashboard](#)

Texas Education Agency [CTE State Dashboard](#)

Tennessee Board of Regents [Career Pathways Dashboard](#)

Rhode Island [Talent Dashboard](#)

Maricopa Community College [NCII Guided Pathways Dashboard](#)

West Virginia’s Data Explorer [Education Pathways](#)

Ventura College [Equity Dashboard](#)
What would you like to know about your own programs/students?

**Student outcomes**
- Student employment, general
- Whether alumni are employed in occupations relating to their program of study
- Postsecondary outcomes

**Participation/Completion**
- Enrollment and concentrator trends
- Nontraditional participation rates
- Cluster enrollment in my district vs. other districts across the state

**Student decision-making/recruitment**
- Drivers of student enrollment choices
- Impact of counseling on student enrollment
- How to market programs

**Program content**
- Alignment to standards
- Transfer between districts

Note: These slides include recurring themes that the TA team identified in reviewing notes and participant responses from the CTE Spring Conference, CTE Portal Session. Participants’ raw responses were also provided to DEED with this report.
APPENDIX: CTE SPRING CONFERENCE PARTICIPANT FEEDBACK THEMES (SLIDE 2)

What would you like to know about other programs in the state?

**Program/course availability**
- What classes and CTEPS are other districts offering?
- Online program offerings
- Which districts are offering programs I’m interested in offering?
- Do students continue in their career pathway through postsecondary and workforce?

**Labor market**
(See following slide)

**Student outcomes**
- Tracking student outcomes
- Job placement

**Career pathways**
- Which programs articulate to postsecondary education?
What would you like to find out about the labor market?

**Labor market trends**
- General trends: growth, decline, demand
- Impact of COVID-19 on labor market
- Job openings by industry and location

**Geographic component**
- Labor market demand in my region

**Job requirements**
- Employer demand for skills, knowledge, or certifications
Who do you share data with? What do they need to know?

**Student outcomes**
- Job placement
- Postsecondary enrollment
- Contribution of CTE course to student success

**Labor market trends**
- Does our program meet labor market demand / prepare students for success?
- What certifications do students need?

**Enrollment/participation**
- Which programs are students participating in?
Desired features—themes and examples

**Usability**
- Greater ease of data uploads
- Like the user-friendliness of example tools
- Searchable crosswalks
- Greater interactivity and additional charts/visuals
- General usability
- Downloadable data in a usable format (e.g., Excel)

**Geographic component**
- Facilitate regional analysis (especially labor market)

**Specific data visualization examples**
- Pie/donut chart
- Heat map
- Scatter plot (like the Texas example)