Learning that works for America

CTE™

Top 10 Things to Know about CTE

1. Over 14 million secondary and postsecondary students are enrolled in at least some CTE courses.[1]
2. Average CTE concentrator high school graduation rate (2007-2008) was 90.18%[2]
3. High-risk students are 8 to 10 times less likely to drop out in 11th or 12th grades if enrolled in a CTE program rather than general education.[3]
4. 70 percent of CTE concentrators stayed in postsecondary education or transferred to a 4-year degree program (compared to the overall average state target of 58%) and transitioned to postsecondary education or employment by December of the year of graduation.[4]
5. CTE students are of all ages – youth to adult – and come from a range of backgrounds and experiences. They can take courses in secondary school and transition into postsecondary institutions, which also offer CTE programs. Further, after time in the workforce, CTE students return to postsecondary institutions to advance their skills and potentially earn more credentials.
6. CTE prepares students for some of the fastest growing jobs forecasted to rise in the coming years such as health care, business, green energy, arts, agriculture and information technology.
7. Experts project 47 million job openings in the decade ending 2018. About one-third will require an associate's degree or certificate, and nearly all will require real-world skill that can be mastered through CTE.[5]
8. 80 percent of CTE concentrators persisted in postsecondary education.[6]
9. Number of CTE credentials awarded nationally in 2006: 2,022,885[7]
10. CTE is evolving and moving toward a common goal of rigor, quality and consistency.

[1] U.S. Department of Education, Office of Vocational and Adult Education, Report to Congress on State Performance, Program Year 2007-2008, http://cte.ed.gov/docs/Rpt_to_Congress/Report_to_Congress_07-08.pdf

[2] U.S. Department of Education, Office of Vocational and Adult Education, Carl D. Perkins Career and Technical Education Act of 2006, Report to Congress on State Performance, Program Year 2007-2008. Washington, DC.

[3] Kulik, James, Curriculum Tracks and High School Vocational Studies (Ann Arbor: University of Michigan, 1998)

[4] U.S. Department of Education, http://www2.ed.gov/about/reports/annual/2010report/fy2010-apr.pdf.

[5] Georgetown Center on Education and the Workforce via Harvard's Pathways to Prosperity report, p. 29, http://cew.georgetown.edu/

[6] U.S. Department of Education, Table 4, http://nces.ed.gov/pubs2011/2011234.pdf

[7] U.S. Department of Education, Table 10, http://nces.ed.gov/pubs2011/2011234.pdf

www.careertech.org

NASDCTEc • 8484 Georgia Avenue, Suite 320, Silver Spring, MD 20910 • 301-588-9630

CAREER TECHNICAL EDUCATION (CTE)
REVITALIZATION GRANT RECIPIENTS

The eight grants awarded from the Career and Technical Education Revitalization Grant Fund (established in 2011 by HB 3362) will benefit 21 schools across Oregon with programs ranging from agricultural science to industrial automation, marketing to engineering, building and construction trades to visual art design. In selecting recipients, priority was given to proposals that demonstrated strong business partnerships, sustainability, and curriculum aligned with both Oregon Diploma requirements and the skills necessary for high-wage and high-demand careers in Oregon.

Revitalization of Crook County School District Manufacturing Engineering Program

Crook County High School, Crook County Middle School, Paulina Community School, Pioneer Alternative High School

Award Amount: $234,900 Anticipated Matching Funds: $140,000
Fiscal Agent – Crook County School District

The Crook County School District Manufacturing Engineering Program will equip students with the personal, mechanical, and professional skills needed for success in **manufacturing and engineering careers**. This project restores a very successful program and expands it to serve two middle schools. Students will receive training on a Computer Numeric Control (CNC) lathe and mill, laser engraver and industrial robot. New equipment will enhance student learning while engaging students through experiential and meaningful projects and activities. Students will also be tested using the National Career Readiness Certificate assessments. Business partners include Pro-Line Fabrication, Inc., Contact Industries, Dayspring Hardwood & Molding, Inc., Pioneer Memorial Hospital and St. Charles Redmond Medical Center.

Visual and Graphic Arts Design

Willamette High School

Award Amount: $161,355 Anticipated Matching Funds: $37,216
Fiscal Agent – Bethel School District

This project will shift Willamette High School's more traditional arts program to a rigorous CTE visual and graphic arts program intentionally designed to enable students to experience authentic career-related learning opportunities. The two-year program will include newly developed coursework in **graphic design, digital photography and digital design**. Students will be job-ready upon completion or they can continue on in postsecondary education. Willamette High School has partnered with several graphic design, marketing and architectural firms that will provide in-kind contributions, student mentoring, project review, internships and job-shadows. Business partners include Cawood Marketing and Design, Imagine Group, Nir Pearlson Architecture, Chris Stebbing Company and Verb Marketing.

Information Technology (IT) Careers in Rural Oregon

Joseph Charter School, Grant Union High School, Arlington Charter School

Award Amount: $108,062.00 Anticipated Matching Funds: $19,842
Fiscal Agent – Wallowa Education Service District

This project will develop a program to prepare rural high school students for workforce entry or postsecondary advancement in the field of **computer science and computer support specialist**. The program will leverage an existing partnership between Wallowa, Grant and North-Central Education Service Districts. Students will engage in rigorous on-line coursework aligned to industry-defined skill sets and will be assessed using industry-standard certification exams. The program is designed to meet the need for building a skilled workforce of computer support specialists by establishing a viable school to work program in the rural communities. The program has partnered with the Wallowa County Health Care District and Blue Mountain Hospital District who will provide internships, job-shadows and some actual job-placements for graduates of the program.

Linn Benton Regional Trades Academy

South Albany High School, West Albany High School, Crescent Valley High School, Lebanon High School, Corvallis High School

Award amount: $435,290 Anticipated Matching Funds: $398,395
Fiscal Agent – Lebanon School District

This project brings together five high schools to form a two-year career occupations project in **electrical, carpentry, building construction, machine technology, welding, and automotive technology**. Students will begin year one with a three-week introductory session. The session provides an overview of career fields, apprenticeships, technical skills and the knowledge required in each Career area. In the remaining three semesters, students will choose one career field to learn and apply introductory through apprentice-level skills and knowledge. As students progress, they will also work in community-based projects or pre-apprenticeship programs. The program provides instruction and active participation from several industry partners, including International Brotherhood of Electrical Workers, NW Laborers Training Trust, National Frozen Foods, Oregon Freeze Dry, and Lebanon Habitat for Humanity.

Multiple Pathways to Career and College Success

Canby High School

Award Amount: $145,436 Anticipated Matching Funds: $122,890
Fiscal Agent – Canby School District

Canby High School currently has seven approved programs of study including **construction technology, marketing, accounting, graphic design, early childhood education, and manufacturing**. Grant funds will expand and further develop student internships, facilitate expanded relationships with local businesses, and recruit new businesses. The partners will play a much deeper role in the high school's CTE instruction. Teachers and businesses will work together to develop lessons and presentation materials. Grant funds will allow staff to spend time at local businesses. In partnership with business and industry, teachers will design curriculum based on real world problems for students to solve in the classroom. Business partnerships for this project include Canby Telcom, Women's Healthcare Associates of Oregon, JVNW Inc., Roth Heating and Cooling, Canby Fire Department, RSG Forest Products, Cascade Fruit Management, Clackamas Technical Education Consortium, Workforce Investment Council of Clackamas County, and Pioneer Pump.

Industrial Automation and Control Systems Technology Project

Pine Eagle Charter School, Eagle Cap Innovative High School

Award Amount: $153,326 Anticipated Matching Funds: $38,000
Fiscal Agent – Pine Eagle Charter School

In Eastern Oregon, this award will support a collaborative effort involving three local companies, two colleges and numerous other local partners. This program addresses a need for home-grown, skilled labor and a shortage of qualified applicants to fill vacancies. The Industrial Automation and Control Systems Technology program will use dual enrollment instruction, work experience and pre-apprenticeship opportunities that lead to entry-level employment or advanced training for licensing, certification or an advanced degree. Programs of study will include **electronics and mechanization** taught by certified math, science and CTE teachers; industry professionals will lead specialty instruction and project-based learning. Instruction will focus on electrical engineering and electrical maintenance technician skill sets. This program will partner area businesses including Idaho Power, Pine Telephone Systems, and Alpine Alarm Communication and Construction.

Building the Pipeline Through Project-Based Learning

Kennedy High School, Mt. Angel Middle School, Silverton High School, Mark Twain Middle School

Award amount: $170,365
Fiscal Agent – Mt. Angel School District

Anticipated Matching Funds: $30,650

This partnership will enable new CTE programs in **pre-engineering, biomedical science/sports medicine, agricultural sciences, and business administration**. By sharing curriculum, infrastructure, professional development, and other resources, each school will be able to expand access to existing CTE programs and build entirely new programs. Both middle schools will begin providing a pre-engineering CTE program and one will also implement an agricultural CTE program. The high schools will expand their existing programs and will share facilities and teachers so that students at each school are able to access both programs. Partners include Cote Chiropractic, Evergreen Aviation, Silverton Hospital, Mt. Angel Fire Department, Mt. Angel Telephone, Mt. Angel Chamber of Commerce, Riedman Home Construction, Silverton Area Chamber of Commerce, Premier Custom Homes, Kraemer Farms, Annen Bros., and Givaudan.

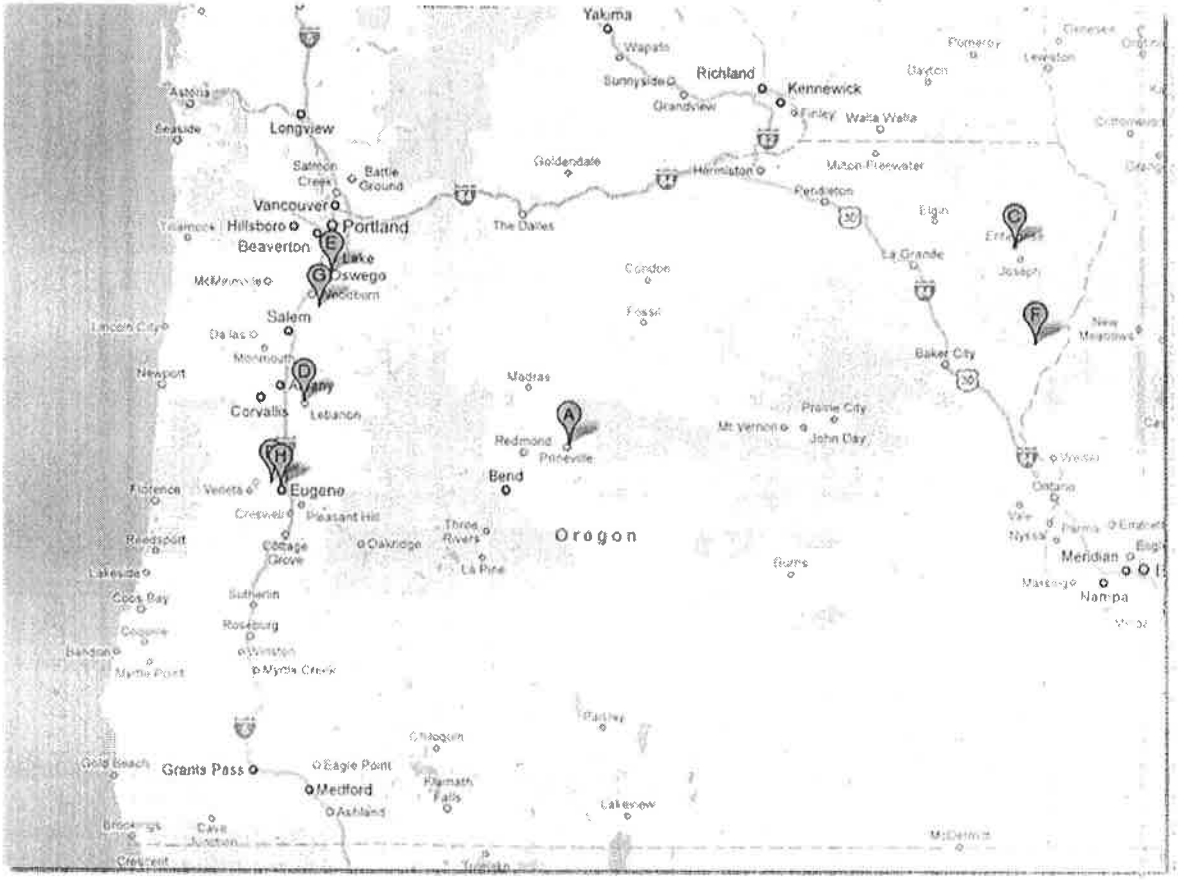
Relevance and Rigor in New STEM Career Paths (Eugene, OR)

Churchill High School, Eugene 4J School District

Award amount: $424,766
Fiscal Agent – Eugene School District

Anticipated Matching Funds: $10,000

This award will enable the Eugene 4J School District to develop an innovative science, technology, engineering, and mathematics (STEM) curriculum in which students will engage in authentic, problem-based engineering projects that are connected with working professionals in the community. The new **engineering and design** program of study will enhance two existing CTE programs and increase rigor in foundational math and science; it will be the first full-scale, coherent pre-engineering program in Eugene. The program will collaborate with engineers and consulting firms to ensure relevance and align curriculum and assessments to industry standards and workplace needs through, for example, hosting teachers in worksite immersion programs and developing and co-teaching STEM activities. Business partners include Balzhiser & Hubbard Engineers, APAZ Architecture, OBEC Consulting Engineers, and Life Technologies.



CTE Revitalization Grant Recipients – 2012

Bethel School District (B)	Visual and Graphic Arts Design
Canby School District (E)	Multiple Pathways to Career and College Success
Crook County School District (A)	Revitalization of Crook County School District Manufacturing Engineering Program
Eugene School District (H)	Relevance and Rigor in New STEM Career Paths
Lebanon School District (D)	Linn County Regional Trades Academy
Mt. Angel School District (G)	Building the Pipeline Through Project-Based Learning
Pine Eagle Charter School (F)	Industrial Automation and Control System Technology
Wallowa ESD (C)	IT Careers in Rural Oregon

Arts Education for the Digital Age: Bold New Visual and Graphic Design Curriculum Launches in Bethel School District

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

When the faculty at Willamette High School in Lane County undertook their new Visual and Graphic Arts Design program, they committed to a fundamental shift in the way they presented arts education. An essential part of a well-rounded curriculum, arts education has traditionally looked backward, covering classical art techniques and history. As art instructor Kate Doyle puts it, "students have been using outdated technology and our arts program has been limited to paper/pencil, ceramics, and standard photography." So Willamette High School made the bold decision to look forward and develop a rigorous visual and graphic arts program that would enable students to experience authentic career-related learning opportunities.

Demanding High School Curriculum Earns College Credit

With the backing of its CTE Revitalization Grant, Willamette's new program set a goal of enrolling approximately 100 additional students in a demanding professional design curriculum. The two-year program includes newly developed coursework in Graphic Design (I and II), Digital Photography (I and II), and Digital Design (I and II). Three courses will be articulated with Lane Community College (LCC) enabling students to enter post-secondary programs having already earned college credit. Additionally, the program is flexible and will allow for advanced learning beyond the first two years..

Every daring new plan needs a visionary to execute it.At Willamette, that individual is current art instructor Kate Doyle. With 20 plus years of graphic design industry experience (which she still pursues in addition to her instructor role), Doyle's exceptionally strong background provides a powerful foundation. Which immediately allows Willamette to integrate visual and graphic design instruction in the fields of architecture, green industry components, and marketing. Susan Lowdermilk of Lane Community College provides instructor mentorship in visual and graphic design to create a seamless bridge between coursework in High School and Community College.

Career Ready Design Software

To launch the project, over the summer a brand-new computer lab was installed with Mac computers (presenting a bit of a challenge for this PC-based district) and up-to-the-minute design software. This additionlaid the technical groundwork for this ambitious program. But it was just the beginning.

The new curriculum, incorporating the Oregon Skill Sets, graduation requirements, and 12 "Graphic Design Competencies" based on LCC, University of Oregon, and industry standards, covers more than just design software. Visual and graphic design students learn about aesthetics; different ways they can present ideas and information (including translating the concepts of others); and relationship skills (designer/client interaction). All of these areas add up to a comprehensive preparation for a career in design.

Students Create Professional Quality Products

Already, student participation has far exceeded the original goal, with approximately 240 students currently enrolled. Every seat is full. Students are engaged in their work—says one Willamette freshman, "I have loved this class and I'm glad that we have it," while a senior shares that the program "has made a difference personally by expanding my imagination and creativity…I'm planning on minoring in graphic design at UO." Students are also beginning to connect this program to others (e.g., Business & Management, Manufacturing Technology).

Each student is developing a portfolio of work, a foundation for his or her foray into the working world. First year projects have included logo design; creating a program for the school band concert; and designing illustrated recipes. "Students are currently creating professional quality graphics which are being turned into album covers and are designing cover materials for school groups and eventually, the local community," says Doyle. Local business partners are also becoming more engaged, realizing the level of graphic design possible at the high school level. Doyle continues, "Students are getting amazing instruction from an industry professional and they are also teaching each other new skills as they explore advanced technical skills via online tutorials."

The true-to-life, hands-on tasks they are completing are comparable to professional-level design work. Says Willamette assistant principal Andrew Van Fleet, "Our digital photography and graphic design course has state of the art technology that allows students to create professional quality products and is led by a compassionate instructor with fantastic industry knowledge. This program is infusing students with the artistic skills to adapt to any digital career."

From incorporating advanced industry knowledge and innovative educational strategies to implementing an integrated approach that doesn't just teach, but trains—Willamette is truly equipping students with a valuable, marketable 21st century skillset in visual and graphic design.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

Building Pathways from Classroom to Career: Canby Takes SMART Steps Toward CTE Internships

Learning that works for Oregon CTE

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

For more than a decade, Canby High School has been building a strong reputation of providing top-notch Career and Technical Education (CTE) programs. Programs include Construction Technology, Marketing, Accounting, Graphic Design, Early Childhood Education, and Agriculture. A state-of-the-art CTE facility was also constructed in 2003. But faculty and administrators wanted to do more to bridge the gap between classroom and career. As Canby building construction instructor Darren Monen puts it, Canby wanted "to enhance students' educational experiences through internships, working with local community and business partners to allow students an opportunity to work outside the traditional classroom setting."

Career and College Success

Because of this dedication to excellent CTE opportunities, when Canby was awarded its CTE Revitalization Grant, administrators were ready to get to work on the Multiple Pathways to Career and College Success project. The primary goal of the project is expanding and further developing student internships using the existing partnership between Canby High School and Clackamas Community College's SMART Internship Program, linking internships to each of the existing programs of study and expanding their job shadow program. The internship experiences are required to meet certain standards and students can earn 1 college credit for every 30 hours of documented internship time.

, Canby has a laser-like focus on career readiness. All sophomores are required to participate in the course Future Focus, where they explore careers, participate in mock job interviews, create a portfolio and resume, and participate in job shadowing. The CTE Revitalization Grant is being used to expand existing structures such as Future Focus to create increasing levels of student opportunity to participate in increasingly rigorous career experiences.

Job Shadowing and Internships

Since the launch of the project, the total number of job shadow sites has expanded from 500 to 800, and internship sites have grown from 45 to 70. Teachers now have an expanded network of business and industry partners, too. "We have had a great response in our community," says Monen. These new relationships are enabling teachers to gain a more thorough understanding of business and industry needs for new employees.

The focus of instruction is shifting to help students develop the qualities necessary to succeed. Recognizing that some students may learn that they ultimately do not want to pursue a particular career, teachers are focused on the importance of "transferable skills." These skills can be used no matter what career the student chooses.

But the biggest innovation at Canby has been expanding the scope and purpose of internships. The teachers and school are thinking beyond the traditional internship programs at a business, and creating a range of opportunities for students that provide these young adults with responsibility and accountability beyond grades. Teachers are looking not only at the community outside of the school, but within the school to create training opportunities for students.

School counselors are also using the internships to help encourage students to stay through their senior year. Many would consider leaving school early because they have met diploma requirements. Instead, they gain

marketable job skills that leave them better prepared to segue into continued studies or a career. Some examples of student-led projects include a self-sustaining construction program where students build a house every 2 to 3 years; an agriculture program where students are responsible for the town's flower boxes; and the manufacturing shop, where students produce toys for a Kiwanis Club.

Mentors, Job Market Understanding, and Next Steps

One student interested in firefighting learned through his internship at a firehouse that he would need to receive EMT training before he would even be considered for employment. He is changing his plan in order to take the classes he needs to complete the training. As a result of his internship, he has mentors in the community and has a better understanding of the job market. Another Canby student, a sophomore who is studying Early Childhood Education, says, "Having the chance to take an in-depth look at children's development has broadened my perspective on how children function. These new skills that I have attained will help me all throughout life…when dealing with my own children and when taking care of others' children."

In future, Canby hopes to share their successful program with more schools. The model and system Canby has created for connecting their school to local businesses and industry can definitely be replicated, and there is hope that they can connect with nearby schools districts like Silverton and Woodburn, where many of Canby's business partners have sites. Additionally, Canby has plans to present at the Oregon Association for Career & Technical Education (OACTE) conference.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

The Power of We:
Students Maximize Their Career Potential Through Lebanon's Unique Academy Project

Learning that works for Oregon
CTE

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

The power of effective collaboration is the standout lesson from the CTE Revitalization Grant project in the Lebanon Community School District. Says Eric Frazier, teacher and project coordinator for Lebanon, the top takeaway "is the ability of schools, administrators, teachers, and school district employees to break through barriers and obstacles. The idea of, 'What would be best for students?' has been the guiding thought for decision making with this grant."

Technical Career Fields Expanding Student Potential

Through the establishment of the Linn County Regional Trades Academy (LCRTA), which encompasses South Albany, West Albany and Lebanon High Schools, students are benefiting from a forward-thinking curriculum; a classroom environment that stimulates and engages; and an introduction to technical career fields that has opened their eyes to their own potential. As one Lebanon junior put it, "I now have more options for what I want to do in the future with a career. Some of which I wouldn't have even thought of doing."

One of the most significant breakthroughs in the LCRTA project to date is the strong interdistrict collaboration that has emerged. The CTE Revitalization Grant has enabled the sharing of resources between schools and districts, introducing an academy approach that is very different than the CTE classes that each of the participating schools has offered previously. According to Candy Baker, Lebanon's Grant Project Director, "students are expanding their world by having to work in new environments and systems with different school climates, cultures, and expectations."

Hands On Exploration of Trades

In this unique academy structure, students begin their two-year career occupations project with hands-on experiences in the trade areas of electrical, woods manufacturing, building construction, masonry, welding and automotive technology. The curriculum track begins with a three-week introductory session to give students an overview of the career field, including skills and knowledge required, applied use of tools and equipment, and employment forecasting. In the remaining three semesters, students choose one career field in which to develop apprentice-level skills.

The course sequence allows students the opportunity to explore six different trades through three-week rotations in the first semester, before pursuing more in-depth training and work experience in a particular area. Two off-campus Apprentice Training Centers specializing in electrical and carpentry training provide additional opportunities. The regional approach involves coordinating and intermingling students and staff from different high schools, as well as providing students the opportunity to gain stronger technical skills through stronger technical programs.

"I believe this project has had an amazing impact. We see students grasping concepts they would not get in any other classrooms. Students are engaged in their work and they want to learn more," says Jessica Ramsey, a welding instructor.

Teachers have also embedded traditional academic instruction (including reading, writing and math instruction) within the CTE curriculum. LCRTA students' academic progress is monitored regularly and weekly sessions have been introduced to provide additional academic support for those who are not doing well in their classes.

Student Contact with Teachers, Trade Organizations, Business, and Industry

The LCRTA has led to much stronger partnerships with trades organizations and industry leadership, and access to regional industry training centers. Teachers, trades organizations, and business and industry leaders have formed a Partnership Council to develop, coordinate and improve project content and instruction. As a result, students "have direct contact with trade unions, and business and industry representatives. Teachers also have the opportunity to develop and deliver applied learning that represents current industry standards and practices," says Candy Baker.

The two-year program culminates with student participation in community-based projects or pre-apprenticeship programs. Through instruction and active participation by private and government partnership members—including the International Brotherhood of Electrical Workers, NW Laborers/Employers Training Trust, National Frozen Foods, Oregon Freeze Dry, Oregon Bureau of Labor and Industries and Linn-Benton Community College—students are able to tap directly into the leading industries in this region, which means their acquired skills in their chosen trade are applicable to current employment needs. This isn't typical "by the book" education, but real-world, on-the-job training.

The result? Empowered, engaged students looking forward to a brighter future—like this Lebanon senior: "Personally this class has turned 'have to go to school' into 'want to go to school.' It has provided incentive to succeed academically in my schoolwork. This class has personally helped me realize that I can excel in trades related working fields. It has helped me realize my interests and set future goals for myself."

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

Brave New Schools: Pine Eagle Launches Innovative CTE Curriculum with Smart Classrooms

Learning that works for Oregon CTE

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

Pine Eagle Charter School and Eagle Cap Innovative High School had a vision to graduate students who are highly qualified for employment in the growing career fields of industrial automation and control systems. Their goal was to provide innovative Career and Technical Education (CTE) opportunities that incorporate classroom instruction, project-based learning and on-the-job training for careers in these fields. But providing students with preparatory CTE instruction posed a problem due to the high costs and logistical challenges, of securing the much needed equipment and training faculty.

Giving Students Great Opportunities

Pine Eagle's CTE Revitalization Grant got the ball rolling. Joe Denig, Pine Eagle's agricultural science and technology instructor states, "The CTE Revitalization grant has provided the option for students to get hands-on learning and training. Learning how control systems function, how to control them, and how to design them gives students great opportunities."

Dual Enrollment, Work Experience, and Pre-Apprenticeship

The Industrial Automation and Control Systems Technology (IACST) program uses dual enrollment instruction with two college partners – Treasure Valley and Linn Benton Community Colleges-, work experience and pre-apprenticeship opportunities that lead to entry-level employment or advanced training for licensing, certification, or an advanced degree. Instruction focuses on electrical engineering and electrical maintenance technician skill sets, while still incorporating the Oregon Skill Sets and the content standards.

The logistical challenges of giving hands-on instruction in robotics and control systems have been overcome in part through a collaborative effort involving three local companies, two college partners, and local individual partners. Business partners ensure curriculum is in line with workforce needs; provide internships and job shadows; provide technical support; and provide equipment. Cammie deCastro, principal of Pine Eagle says, "Our students…are now exposed to hands-on career-related experiences. The program incorporates instruction from community partners, tying classroom work to real-world careers. The program also brings relevance to math, science and technology classes."

Smart Classrooms Sharing with Other Schools in the Region

Both schools are also incorporating "smart classrooms" where instruction may be updated as needed and transmitted and shared with other small schools in the region. Industry partners plan to connect with students directly in the classroom through broadcast "field trips" and classroom visits. "This type of program would not have been possible without this grant," says Denig. "The control systems and technology that students are working with were not normally found in our districts supplies, nor was there the funding available to develop this comprehensive instruction."

To ramp up for the new program, faculty attended summer professional development with Project Lead The Way® at Oregon Tech and a session with Idaho Power to learn about the use of Programmable Logic Controllers (PLCs). That knowledge has been transferred to the classroom, where students are learning how to use the same PLCs and develop a control system for Pine Eagle's on-campus green house.

Programming Robots Piques Student Interest

Students are enthusiastic—due in no small part to how the curriculum is presented. "To start to pique student interest, the first steps are working with programmable robots," says Denig. "This has definitely enhanced student interest in the curriculum." One Pine Eagle freshman shared that "it was amazing to watch the robots move to our commands. Knowing that this is how many of our common appliances work is totally mind-blowing."

The coursework builds upon this early "cool factor," reaching professional-level instruction. Understanding PLCs has been key; says one Pine Eagle freshman, "After learning about the PLCs, I found that many things we rely on daily run this way. For example, fire alarms are run this way. This provides many job options, and it interests me." A Pine Eagle junior concurs, "I have never taken a class like this before…I have enjoyed the opportunity of learning so many new and very different things," and a senior recognizes that "learning to write programs is useful in many different fields."

Job Shadows and Internships

Feedback from industry partners—and potential employers—is also positive. One representative from Idaho Power described how a job shadow student quickly began to understand the possibilities open to him when he applies himself in school. A representative from Pine Telephone said the intern projects have helped them understand the needs of the workforce (deadlines, producing quality work, getting along with others, etc.).

Looking forward, Pine Eagle seeks to replicate coursework at Eagle Cap Innovative High School and additional schools—the smart classroom approach makes it possible—and will continue to expand on postsecondary opportunities, including working with Linn-Benton Community College and their collaborative mechatronics program with Treasure Valley Community College. It's a brave new world of CTE instruction, and Pine Eagle is forging a path worth following.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

Career Success STEMs From New Investment: Eugene Reinvigorates CTE Curriculum

Learning that works for Oregon CTE

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

In order for Science, Technology, Engineering and Math (STEM) education to fulfill its purpose of equipping students for emerging career fields it must do more than just cover math and science. That's why the Eugene School District's Relevance and Rigor in New STEM Career Paths project at Churchill High School does so much more. Utilizing its CTE Revitalization Grant, Eugene increased rigor in foundational math and science curriculum, developed a new "Engineering & Design" CTE program of study, and enhanced two existing CTE programs in environmental science and health services.

Relevance and Rigor

From the outset, Eugene zeroed in on two core areas: First, collaborating with engineers to ensure relevance by aligning curriculum and assessments to industry standards and workplace needs; hosting teachers in worksite immersion programs; and developing and co-teaching STEM activities. Second, involving postsecondary faculty to ensure rigorous aligninment of curriculum to meet admission requirements in college STEM programs. Eugene faculty also committed to making sure the STEM curriculum will meet or exceed standards for two- and four-year college readiness.

The goals of the program are ambitious—but achievable. Part of the picture is having the right educators in place, and equipping them with the resources they need. To that end, Eugene has added two new staff—one focused on effective math strategies, the other focused on science curriculum and instruction—and invested in new professional development for teachers and staff. This includes training in ThinkReady™, Smarter Balanced Assessment, and the Advancement Via Individual Determination (AVID) college readiness system for use in CTE classrooms.

Faculty have increased the rigor of coursework—both within the STEM program and school wide—and are focusing on assigning tasks that are relevant to the career field, not just "seat work." As Churchill engineering teacher Marty Wilder puts it, "students create real solutions to real problems. We give them the skills and materials they need and then support them in taking risks, trying things out and then making improvements and trying again… [it's] student-directed learning."

Bridging the Gap Between Curriculum and Career

This is what sets Eugene's Relevance & Rigor program apart: Bridging the gap between curriculum and career. By providing opportunities for hands-on learning, this program enables students to engage in authentic, problem-based engineering projects that are connected with working professionals in the community. Teachers also coach students on transitioning from high school student to successful worker withproblem solving, deeper thinking, and guided inquiry—all part of the ThinkReady™ approach. A new STEM studio, equipped with state-of-the-art engineering equipment and technology, will give students the chance to develop and hone up-to-the-minute skills that are immediately applicable upon graduation.

While the Relevance & Rigor program is still in its early stages, the revamp is already reaping better results in terms of faculty enthusiasm, community investment, and perhaps most importantly, student engagement. "This has been huge in making school more meaningful," says Theresa Hilkey, Churchill's STEM coach and math

teacher. "Our enrollment has increased because students have a desire to learn about engineering. They have had field trips, guest speakers, and connections with colleges."

Empowering and Engaging Students

Says Marty Wilder, "Even at this stage, I see these courses capturing the attention of students who have disengaged from their mainstream academic experience. For some, this is the first time they have gotten recognition for talents and skills in mechanical aptitude and spatial relations. For others, it is one of the few opportunities they have had to follow their curiosity and shape their own curriculum."

Due to the CTE Revitalization Grant Eugene has already made changes in 11 key areas—including new training, new hires, and new staff activities—. But Relevance & Rigor doesn't stop here. Eugene administrators hope to get more freshman and sophomore students involved, possibly through Mathematics and Science Partnership Grants or other funding sources. And to further equip students to continue their education, faculty are working on elevating the focus on college and the Federal Application for Student Aid (FAFSA) —with a goal to reach 80% FAFSA submission.

All this serves to empower and engage students and show them their full potential. One Churchill junior calls the classwork "interactive, interesting, and new," while a freshman says it "really gets your brain thinking." Most exciting is the fact that some students are already appreciating the long-term impact, like another Churchill junior who says, "It is really helpful to me because I want to become an engineer when I graduate."Thanks to Eugene's commitment to rigor and relevance, that is more than just a student's dream—it can become reality.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

A Fresh CROP of Information Technology Professionals: Bringing Cutting-Edge Career Options to Wallowa

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

Rural Oregon may seem like an unlikely place to find jobs in information technology (IT)—but in the northeastern part of the state, the need is keen and the opportunities are real. Case in point: IT staff employed by the Wallowa Education Service District (ESD) also functions as the IT support staff for local government. The result is that despite the logistical challenges in these geographically large, rural "Frontiers," the Wallowa ESD was perfectly poised to offer high-quality and highly- marketable IT training and certification to its students through its IT Careers in Rural Oregon Project (IT CROP).

Growing a Local Workforce

Says Wallowa Superintendent Karen Patton: "The long-term impact to our region will be a skilled workforce to draw from when hiring for IT support positions. It has been a challenge to attract applicants. Many are not native to the region and desire to work in a less rural setting. By providing this opportunity, we hope to grow a local work force. Students will acquire a set of portable industry recognizable skills and certifications that will allow them to pursue paths in recession-proof careers available in rural and urban settings alike."

IT CROP is a 15-month pilot program funded by the CTE Revitalization Grant. The program, involves teachers from three (3) high schools (Arlington, Joseph and Grant Union) and the IT support staff from Grant, North Central and Wallowa ESDs. Teachers, IT staff and the Computer Information System (CIS) instructor from Treasure Valley Community College (TVCC) have collaborated to provide college-level courses through Moodle (an open-source tool to create virtual learning environments). The three courses matriculate to TVCC programs in Computer Information Systems (CIS) Support Specialist Career-Pathways Certificates. Students completing the courses this year will be eligible to take the first part of CompTIA's A+ Certification.

College and Career Ready Students

Utilizing effective collaboration, the faculty familiarized themselves with the new instructional content and are constantly working together to meet students' needs while remaining committed to college-level standards. Two (2) new CIS courses (110 and 111) were developed and added to the high school curriculum. Not only do the students like the subject matter, they also really like the fact that they get to earn college credits. What makes the IT CROP curriculum special is that it is "interesting and challenging," says one Joseph Charter junior, while another says, "This class has made a difference to me personally because I now have a better understanding of computers, so when I go to college I can use the things that I have learned."

To cap off the program, student internships—including work-for-pay opportunities—will be made available through local government agencies, companies and hospitals. Each student will participate in the job application and interview process as well as complete a minimum of 16 hours of formal job shadowing.

Further highlighting the district's long-term goal of growing a strong IT workforce, a Pearson testing center has been set up to allow students to earn national IT certifications. This center is also available to the community, and may be expanded to include medical certification examinations.

IT CROP's early accomplishments prove that, as Wallowa Superintendent Karen Patton describes, despite the logistical challenges, "small remote rural schools are able [to provide] relevant, alternative and sustainable learning opportunities in a setting where providing varied options has become a significant challenge."

Schools Working Together to Provide Opportunities

Starting in spring 2013, each of the 15 school districts will have access to the courses and teacher professional development. Josh Kesecker, Technology Coordinator for Wallowa ESD, sees great potential for IT CROP. "It's not very common for rural schools to be able to offer these sorts of programs, as there often aren't enough [resources] to make it pencil out," says Kesecker. "However, it certainly is inspiring to see schools from all over Eastern Oregon work together to pool their students and resources into a great, sustainable program."

As Karen Patton puts it, "A small group of dedicated teachers, IT staff, ESD superintendents, and college staff have come together to build a program that truly meets the dual need of building a skilled workforce for communities and offering varied educational opportunities for students in remote small schools."

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

Better Than Ever: Bringing Quality Manufacturing Engineering Instruction Back to Crook County

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

Crook County High School (CCHS) is located in beautiful Prineville, OR, which has been hit hard by economic challenges including the highest unemployment rate in the state. At the end of the 2008-2009 school year, Crook County High School's popular Manufacturing Engineering program was cut along with two manufacturing instructors.

Demand for the program never went away. "Since the original Manufacturing Program was eliminated, this program has been highly requested by students and members of the community," says CCHS's school-to-work coordinator, Leslie Waetjen. Students reacted by choosing to attend school elsewhere; many students left the district for others nearby. The long-term impact would mean fewer technically trained graduates—and fewer trained engineers and technicians working in Crook County.

Bringing Back a Needed Program

But now, four years later, the program has been resurrected through the CTE Revitalization Grant—and even better, it has been expanded to include Crook County and Paulina Middle School students. In its first year, 275 students will benefit.

It's an auspicious start for the Revitalization of Crook County School District Manufacturing Engineering Program. And although CCSD's previous model was successful, administrators and faculty are seizing the opportunity to not only bring back the program, but make it better than ever.

Collaboration with Business, Students, and School Create "Phenomenal" Programs

This means updating and expanding the current facility to include hands-on workspace and design rooms with new equipment and cutting-edge technology. Administrators also met with industry partners to identify the desired outcome from graduating students. The message was that they not only needed graduates with manufacturing skills, but they also needed candidates with "soft skills" that would apply to any business.

Collaboration between faculty is key in the revitalized program. All of the CTE classes in the school work together on projects. The manufacturing program will work closely with the business program to develop and market products for students including award plaques engraved on the new laser engraver. The teachers from the business manufacturing programs even carpool together, allowing them time to plan for program intersections. This has helped produce a collaborative environment that all of the CTE classes have benefitted from.

From the beginning, students have remained in the course, and more want in—in fact, more students than CCHS can take. CCHS's school counselor refers to it as "phenomenal." Feedback from students include "amazing," "super fun," and "cool," and they say they are more "hard-working," "responsible," and "eager" than before. One senior rather eloquently shared that, "I honestly enjoy this class very much and hope that children in the future will get the chance to use and operate all the necessities that are presented to me and maybe more.

Career and College Ready Students

In the revitalized manufacturing program, Crook County is also pursuing opportunities for students to complete internships with local businesses. "At least two manufacturing businesses, Integrated Communications Inc. and Contact Industries, are currently developing internship programs where our students will develop and practice their skills," says Leslie Waetjen. There are also opportunities for middle school students to visit the high school to view hands-on applications of the curriculum and participate via video link. Eventually there will be opportunities for regional and state colleges and businesses to use the high school facility to train students and employees.

Already, "this project has had great impact," says Michelle Jonas, assistant principal at CCHS. "These added classes have really filled a need at our school for both students and our community. Businesses have played an active role in what they see need to be taught so that our students are career and college ready." Case in point: faculty report that more seniors are involved in classes all day, rather than just the minimally required coursework.

Additionally, a new VEX robotics program will be debuting early this year, much to the excitement of students and faculty alike. CCHS will be home to the program, but more students will be plugging in when the K-8 school in Paulina begins to teach with the VEX robotics kits.

Thanks to the CTE Revitalization Grant, Crook County's manufacturing engineering program is back—and better than ever. And a new crop of fired-up, well-equipped future engineers and technicians are (almost) ready to help revive their community.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us

From Project-Based Learning to Profession: Mt. Angel and Silver Falls Create a Pipeline to CTE Careers

Learning that works for Oregon
CTE

The following narrative is a summary of a CTE Revitalization Grant Report. It represents a compilation of interviews, visits, and grant documentation developed through collaboration between the Secondary/Postsecondary Transitions Team and Kate Coppin.

Recognizing the need to offer Career and Technical Education (CTE) to more students, Mt. Angel and Silver Falls School Districts worked together to creatively expand their program. As a result, they turned their attention to four different project-based learning programs in engineering, biomedical, agricultural science and business courses. The goal was to offer the programs at Kennedy High School and Silverton High School before expanding to all 27 member schools in the Mid-Willamette Education Consortium (MWEC) region. Mt. Angel Middle School students would also be offered pre-engineering courses and students from Mark Twain Middle School would be offered an agriculture class at Silverton High School.

With the support of the CTE Revitalization Grant, Mt. Angel and Silver Falls were able to launch the Building a Pipeline Through Project-Based Learning project. They have the support of an impressive line-up of educational partners including Chemeketa Community College, Oregon Tech and Oregon State University. Industry partners from local government agencies, health care providers, construction firms, and agriculture also are participating in the initiative. One partner, Dr. Cote of Cote Chiropractic and Vice President of the Oregon Board of Chiropractic Examiners, said "the school district has a low percentage of students moving on to post-secondary studies, so programs like this are imperative to prepare the majority of the students for their lives beyond high school."

STEM Related Careers and Curriculum

Enacting a curriculum that runs vertically (between middle and high schools) and horizontally (across the Mt. Angel and Silver Falls school districts) has been an ambitious undertaking. Transportation was recognized immediately as a challenge, but Mt. Angel decided it was important enough to take on the expense of buses. Upgrades to classrooms have made all the difference—says Mt. Angel science teacher Carlie Harris, "Major improvements to our CTE/Science classrooms help us implement the curriculum, which better prepares our students for Science, Technology, Engineering and Math (STEM) related careers."

Teachers have pursued extensive professional development to enable them to meet more rigorous curriculum requirements, with training from Project Lead the Way®, the Curriculum for Agricultural Science Education (CASE®), and the Perry Initiative. Industry partners have also enhanced the quality of instruction with increased access to essential equipment such as agricultural equipment from partner NORPAC Foods, Inc.as well as real-life work experiences, such as a hospital externship that demonstrated STEM needs in the medical industry.

High School and Middle School Connections

One of the hallmarks of this innovative Pipeline project is reaching out to middle school students so they can realize their options once they enter high school, and learn where their coursework could lead in terms of career opportunities. The early stages of these programs have met with success. Silverton agriculture teacher Daniel James, "This has developed an early interest and nice partnership with the high school before they are actually enrolled in their freshman year." The middle schools truly feel like a partner with the high schools.

High school students are enthusiastic, too. One Kennedy High School junior said, "I feel more confident about the engineering field. I think it is a good fit for my skill sets." Another junior at Kennedy commented on the value of the project-based learning, "I have never been able to experience competitions and real life

opportunities [before]…I really like school now!" For now, the middle school course in Silverton is only offered for one semester of the year, but students have expressed a desire to take the classes year round and sample other CTE areas as well.

More Highly Skilled Candidates for Employment

Teachers have also been pleased with the number of girls signing up for the welding course and the health and robotics programs. Silverton High School welding instructor Scott Towery said that the Pipeline program enabled him to offer an all-girl welding class that "has helped female students develop an interest in this CTE area, which is traditionally dominated by men. In past years, only one or two girls would enroll in the class. I believe [my] class filled up with non-traditional students because it sparked an interest with our girls at Silverton." One senior shared her thoughts, saying, "It is the best class of the day. It is fun, energetic and I enjoy the hard work. I like welding with other girls, it feels safe and comfortable."

Mt. Angel and Silver Falls School District's Pipeline program is already reaping results beyond the classroom, strengthening partnerships horizontally between districts and vertically between the middle schools, high schools, and Chemeketa Community College. The outcome will be more students in the CTE programs at all four schools; more articulated credits awarded with an increased likelihood of students enrolling in Chemeketa in these programs; and perhaps most crucially, more job prospects for graduates and more highly skilled candidates for local employers.

Contacts

Donna Brant, Education Specialist
Office of Educational Improvement and Innovation
503-947-5622 donna.brant@state.or.us

Tom Thompson, Education Specialist
Office of Educational Improvement and Innovation
503-947-5790 tom.thompson@state.or.us