

Oregon Must Compete

Reducing our skills gap through innovative
education models

A report by:  **AMERICA'S EDGE**
Strengthening Businesses Through Proven Investments in Kids

Acknowledgements

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Who We Are

The business leaders of AMERICA'S EDGE take a critical look at the knowledge, skills and abilities businesses need their employees to have in the 21st century, including the ability to be communicators, collaborators and critical thinkers. Using that analysis, we educate policymakers and the public about high-quality, proven investments that strengthen businesses, establish a foundation for sustained economic growth, and protect America's competitive edge in a global marketplace, while helping our nation's children get on the right track.

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Executive Summary

Oregon must expand investments in promising, innovative high school models to teach students not just rote academic learning but also crucial skills such as problem-solving, effective communication, critical thinking and collaboration – the *deeper learning* skills needed to produce a world-class, competitive workforce. Deeper learning incorporates showing students how to transfer the knowledge they have acquired in one subject to use in different settings – students “learn to learn.”

The Oregon Education Investment Board, a governor-led body charged with developing a quality statewide education system, has set a goal to ensure the state’s workers are prepared for the jobs of the future. The Board’s goal, known as the 40-40-20 goal, seeks to make sure that by 2025, every Oregonian has achieved at least a high school diploma, 40 percent of residents have earned a post-secondary credential, and 40 percent of citizens have obtained a bachelor’s degree or higher. But without substantial investments in quality high school programs that integrate career relevance instruction with a rigorous academic curriculum emphasizing deeper learning, achieving this goal is highly unlikely. Today, education is too often separated from real life, so it can be hard for students to see how education will be relevant to them as adults. This is one reason why one-third of Oregon high school freshman do not graduate high school on time and less than 30 percent of residents have a bachelor’s degree.

Oregon’s post-secondary education goals are critical because Oregon jobs requiring post-secondary education are expected to grow 40 percent faster than jobs for high school dropouts. The vast majority of high-growth, high-wage positions will require post-secondary education. Positions in science, technology, engineering and math (STEM) are growing particularly fast, and 94 percent of these jobs will require post-secondary education by 2018. Further, Oregon business leaders report that even when they find young people who have met education milestones, they are not getting the employees with the skills needed in today’s global market. Today’s jobs require workers with not only a mastery of the core curriculum, they also need a workforce with problem-solving, critical thinking, communication and collaboration skills.

To secure Oregon’s economic future and sustained growth, business leaders are calling for greater access to innovative high school models to better equip young people to be college and career ready. Both promising and proven education models provide relevant and core academic curricula that prepare students for education and career beyond high school, while also providing them with practical job skills, hands-on experience and connections to local employers. These models all utilize project-based learning, numerous written and oral communication activities, and work-based learning opportunities.

The future of Oregon’s economy depends upon the caliber of our workforce. As we continue the debate on meaningful education reform in our state, the conversation must include promising education approaches that develop the deeper learning skills in our young people that our businesses expect – and need – from their workforce.



Oregon Must Compete

Reducing the Skills Gap and Creating a Skilled Workforce Through Innovative Education Models

Unprepared Students, Unprepared Workers: Although businesses have always needed workers proficient in the “3 Rs” – reading, writing and arithmetic – today’s fast-paced, international marketplace requires even higher proficiency levels in these hard skills. But they are too often lacking, especially among those entering the workforce.

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- According to the *Nation’s Report Card*, only 33 percent of Oregon 8th graders are proficient in math and reading and only 35 percent are proficient in science.¹
 - 32 percent of Oregon high school freshmen do not graduate within four years.²
 - Among those who do make it to graduation, only 29 percent of Oregon Class of 2012 graduates taking the ACT college admissions test met college readiness benchmarks in all four core areas tested – English, math, reading and science. Students were least prepared in science.³
 - Over half of recent graduates at Oregon community colleges and 1 in 10 students at 4-year colleges need remediation.⁴

Post-secondary education and training are not the only preparation employers want. Three out of four executives believe that soft skills will become even more important in the next three to five years because of global competition and the pace of change in the business environment.⁵ But in a 2010 survey of 2,000 executives conducted by the American Management Association, nine out of ten executives said that soft skills like communication, collaboration and critical thinking are important to support business expansion, but less than half of those executives rated their employees as above average in those skills.⁶

What is Deeper Learning?

Business leaders know that young people entering college and the workforce need a mastery of core academic subjects. But they need more:

- The critical thinking and problem-solving skills necessary to find answers to challenges that, unlike multiple choice tests, are not on the page in front of them.
- Part of those skills come from learning how to learn – knowing how to find out what they do not already know.
- They will need effective written and verbal communication skills to work as part of a team or to interact with the public.
- And, to work as a team, they will have to master collaboration skills, such as interpreting others’ messages and responding appropriately.

This preparation includes going beyond rote learning to transfer what they have learned in one subject and apply it in new ways or different settings in the workplace. It also requires the ability to regulate one’s own behavior and emotions to reach goals. Research cited by the National Research Council, for example,

Oregon jobs requiring some education beyond high school are projected to grow 40 percent faster than jobs for high school dropouts

	2008	2018	Additional Jobs
High School Dropouts	201,000	214,000	+13,000 Jobs
Postsecondary	1,179,000	1,302,000	+123,000 Jobs

40% Faster Job Growth

Source: Georgetown CEW, 2011

shows that being conscientious – “being organized, responsible, and hardworking – [has] the strongest correlation with desirable work and educational outcomes [while] anti-social behavior is negatively correlated with these [desirable] outcomes.”⁷ These are skills that can be taught and reinforced, especially in the workforce. All of this goes beyond “textbook” learning to provide students and workers with the skills now needed in a competitive global market.⁸

Preparing for the Jobs of the Future

With weak education outcomes, dissatisfied employers and an increasing emphasis on soft skills, how will the Oregon workforce of the future fare? Data suggest that Oregon needs to make major changes to keep its workforce competitive with other states and internationally.

The Oregon Education Investment Board, a governor-led body charged with developing a quality statewide education system, has set a goal, known as 40-40-20, to ensure the state’s workers are prepared for the jobs of the future. The Board wants to make sure that by 2025, every Oregonian has at least a high school diploma, 40 percent earn a post-secondary credential and 40 percent obtain a bachelor’s degree or higher.⁹ Currently, 29 percent of Oregon residents have a bachelor’s degree and an additional 8 percent have an associate’s degree. An additional 28 percent have some college, but no degree.¹⁰ While others may have training or certificates, it is clear that Oregon needs to keep producing workers with some sort of higher education experience or training in order to keep up with employer demand and future projections.

While over two-thirds of current Oregon jobs require only a high school diploma or less, job growth is skewed toward jobs that are either highly skilled (bachelor’s degree or above) or medium-skilled (associate’s degree, vocational degree or professional

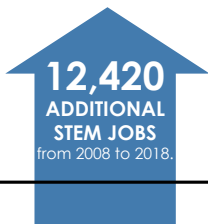
accreditation.)¹¹ Oregon jobs requiring post-secondary education are expected to grow 40 percent faster than jobs for high school dropouts or for high school graduates. There will be only 13,000 more jobs for dropouts and 32,000 jobs for high school graduates in 2018 compared to 2008. But there will be 123,000 additional jobs for those with post-secondary education.¹² Furthermore, over three-quarters of the fastest growing jobs with above average wages will be jobs that require post-secondary education.¹³

To prepare workers for these jobs, Oregon’s leaders seek to prepare students for jobs in Science, Technology, Engineering, Arts and Math (STEAM) fields, called STEAM jobs. While many states are pursuing educational goals to support preparations for Science, Technology, Engineering and Math (STEM) occupations, Oregon’s approach is broader, also including creative arts among the skills our future workforce needs.¹⁵

Science, Technology, Engineering, Arts and Math Occupations Grow

From manufacturing to banking, and e-commerce to health care services, technology is increasingly central to many jobs. Manufacturing, for example, has shifted to more advanced, computer-assisted production, replacing the manual labor force with automation on the shop floor. To remain viable, workers in manufacturing facilities must now have a technical skill or trade-based skill that machines cannot adequately perform, such as knowledge of mechanical and electrical engineering processes, the ability to operate automated manufacturing systems, and the ability to work with computerized systems and read and write machine programming code.¹⁴

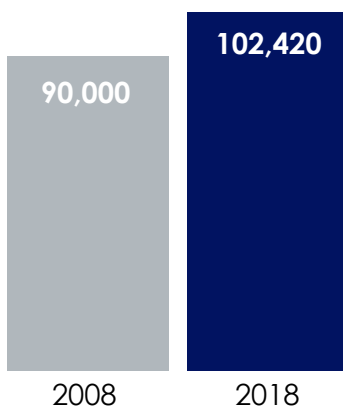
While nearly one-third of all manufacturing jobs nationwide were lost during the recession, the Manufacturers Institute reported in late 2011 that nearly half a million manufacturing jobs were unfilled. Its survey showed that 67 percent of manufacturers have a moderate to severe shortage of available, qualified workers, with even higher shortages in skilled production positions. The inability to find skilled workers is hurting manufacturers' competitive readiness. Seventy-four percent of respondents said that workforce shortages or skills deficiencies in skilled production roles are having a significant impact on their ability to expand operations or improve productivity. These jobs require the most skills and are often the hardest to fill. Over half of those surveyed anticipate the shortage to increase in the next three to five years.¹⁶



Jobs that are heavily reliant on technology are also growing fast. The number of STEM jobs in Oregon is expected to grow by 13 percent between 2008 and 2018.¹⁷ Workers often need post-secondary education to capitalize on these types of jobs. In

fact, 94 percent of Oregon STEM jobs will require post-secondary education by 2018 and 65 percent will require a bachelor's degree or higher.¹⁸

Oregon STEM Job Growth



Source: Georgetown Center on Education and the Workforce, 2011

Required skills and traits for manufacturing

What Was Needed Then...

- Learning one or two specific technical roles
- Physical strength & flexibility
- Ability to follow fixed, unchanging procedures
- General attention to production & safety procedures
- Following orders
- Operating, maintaining, designing mechanical machinery

...And What's Needed Now

- Mechanical reasoning, logic, troubleshooting & spatial visualization
- Personal flexibility, communication & cooperation
- Initiative, persistence & independence
- Attention to detail, self-control & dependability
- Making independent decisions
- Operating computers or computerized machinery & using computers for a wide range of critical functions

Handler et al., 2009

Health care jobs are also growing rapidly in Oregon, with 30 percent growth between 2010 and 2020. But only 15 percent of health care jobs in 2020 will be for those with only a high school diploma; 85 percent will require some post-secondary education.¹⁹

Filling those jobs may be difficult. In 2001, Oregon ranked 15th in the nation in terms of per capita degrees granted in science and engineering. In the latest rankings, Oregon has fallen to 34th in the nation.²⁰ Going in this direction will make meeting Oregon's 2025 goals difficult to achieve.

Demographic changes are also having a profound impact on the workforce. The retiring generation typically has more education and skills than the generation entering the workforce. New immigrants also tend to have lower education levels than native populations. As a result of these trends and the need for higher education in jobs, Oregon is most certainly at risk of facing a major skills gap in the future.

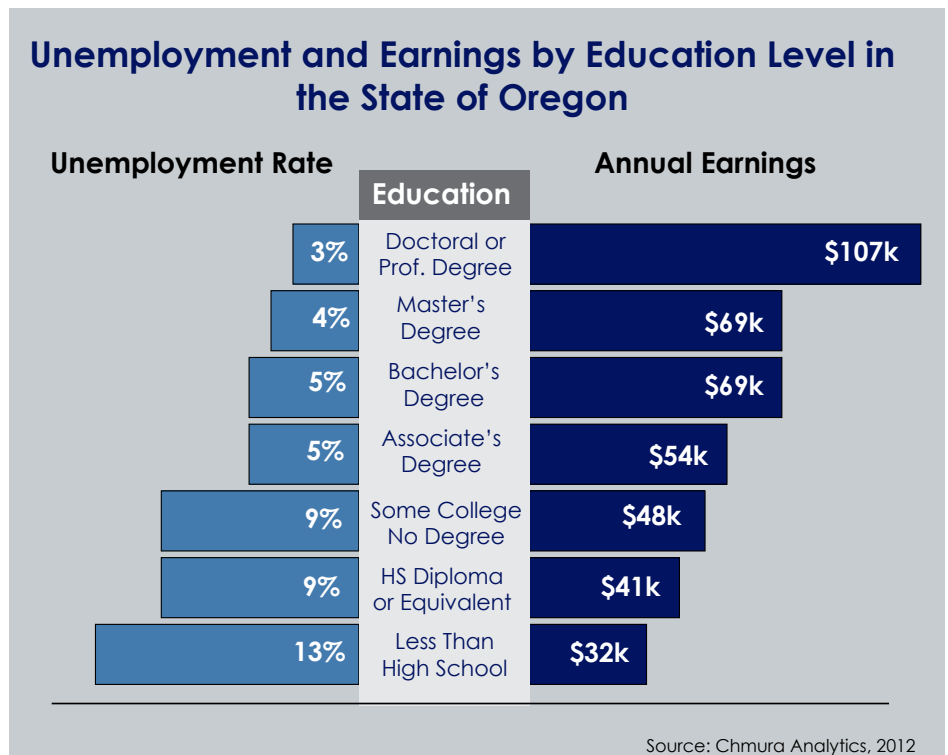
The United States Is Falling Behind

Oregon is not alone. Thanks to technology, more and more American workers are now directly competing with workers from around the world. How U.S. students stack up against students from other countries is, thus, increasingly important – but the United States is no longer on top.

The U.S. high school graduation rate ranks in the bottom quarter of developed nations.²¹ On an international test of applied

knowledge and skills, the Programme for International Student Assessment (PISA), U.S. 15-year-old students score significantly below the average for industrialized nations in math and trail far behind leading countries like Korea, Japan and Finland in reading and science.²² Once a leader in math education, U.S. high school students now fall in the bottom half of teenagers from developed countries. The U.S. is getting worse results while spending almost 40 percent more on education: U.S. spending per student in 2009 was over \$11,800, compared to an industrialized nation average of about \$8,600.²³

Although higher education attainment in the U.S. has continued to climb, we are not keeping pace with other nations and not growing fast enough to keep up with labor market demand. As recently as 1995, the U.S. was tied for first in college graduation rates. But as other countries dramatically improved their college completion rates, the U.S. has fallen to 13th out of 25 industrialized nations – decidedly in the middle of the pack.²⁴



- collectively earn \$10 million more in an average year than they would have without a diploma;
- spend \$1.2 million more each year purchasing vehicles;
- buy homes worth \$30 million more by the time they reach the midpoint of their careers;
- support 90 new jobs in the state;
- increase the gross state product by \$12 million; and
- increase state revenues by \$800,000 annually through their increased spending and investments.²⁵

High school dropouts are so much less productive than high school graduates that each new class of Oregon dropouts will earn \$1.39 billion less over their lifetimes than their high school graduate peers.²⁶ These staggering earnings losses translate into less spending power, fewer contributions to the tax base and lower productivity. The returns from a college degree are even greater. The average lifetime earnings of an individual college graduate are \$2.1 million higher than those of a high school dropout and \$1.6 million higher than a high school graduate.²⁷

Higher levels of education can also help protect against unemployment, even in a recession. In 2011, 14 percent of high school dropouts nationwide were unemployed. Those without a diploma who were employed were only making an average of \$451

The United States is Falling Behind

Once a leader in math education, U.S. high school students now fall in the bottom half of teenagers from developed countries – behind such countries as Slovenia, Hungary and Poland, and far behind leading countries like Korea, Japan and Finland.

–Organisation for Economic Co-operation and Development, 2010

High Cost of the Skills Gap

The lack of a skilled workforce comes at a high cost for individuals, businesses and the economy. Graduating just an extra 1,000 of Oregon's high school dropouts – less than 10 percent of the Class of 2010's dropouts – could result in impressive economic benefits. These 1,000 extra graduates would likely:

per week. In contrast, only 5 percent of those with a bachelor's degree were unemployed, and employed college graduates could expect to make an average of over \$1,000 per week.²⁸

Remedial courses and training to help students catch up and get on track for higher education and training are helpful, but they are expensive and inefficient. Over half of recent Oregon public high school graduates transitioning to community colleges enrolled in at least one remedial class. One in 10 students at Oregon four-year colleges needs remediation. Oregon students placed into remedial coursework are far less likely to complete their degrees, with only 13 percent of community college students graduating within three years, and half of four-year college students graduating within six years.²⁹ In Oregon, remedial education costs students and the state an estimated \$52 million annually, and up to \$73 million annually after factoring in the reduced lifetime wages of students taking remedial courses.³⁰

Changing Course

As Oregon and the nation wrestle with the vitally important debate on education reform, businesses know that career relevance must be incorporated into the classroom. Too many students do not understand why they need to know what they are being taught, lose interest in school and then do not develop the deeper learning skills employers expect them to have. Innovative high school education models help students stay engaged in school so they graduate with a concrete understanding of what they will need to succeed in the workforce and education post-high school, thus better ensuring Oregon businesses have a workforce armed with the skills required in a global marketplace.

Integrating Career Relevance into the Classroom

A common element to proven and promising high school education models is integrating rigorous academics, career-relevant instruction, support services for students and real-world, work-based learning experiences supported by industry and community partners over a three- or four-year period.

Career Academies is a proven approach found throughout the United States that incorporates real-world, work-based learning. Although some programs are stand-alone schools, including charter or magnet schools, most are pathways within larger comprehensive high schools. Often called a "school-within-a-school," pathways typically comprise no more than 200 students who stay together with the same teachers for the duration of the program. That continuity helps create close relationships among the students, their peers and their teachers. It creates the kind of

"team player" mentality employers too often find lacking in their younger employees.³¹

Here are some key elements in Career Academies:

- *Work-based learning*, such as mentorships, job shadowing opportunities and internships with local employers, brings actual career relevance to the students, deepening their understanding of how traditional academics are used in careers. This helps direct them toward training and education opportunities that will provide them with the skills Oregon employers are seeking.³²
- *Project-based learning* helps students make connections across subjects and brings greater relevance to classroom learning. Students work together on projects, developing academic and technical skills, as well as more experience with collaboration, communication and critical thinking.³³
- *School-based enterprise*, like student-led businesses or community service initiatives, is another form of work-based learning. It allows students to design, produce and deliver real products and services.
- *Support services*, including counseling as well as additional instruction in reading, writing and mathematics, help students keep their grades up and stay on track for graduation.³⁴

Enhanced Skill Levels

Through hands-on learning, students gain the practical skills that cannot be taught from a manual or learned through a classroom lecture, in addition to the core academic content they also need to master. For example:

- McMinnville High School in Oregon has a career pathway program, the Engineering and Aerospace Science Academy, which offers a hands-on STEM education program to prepare students for college and professional careers in engineering. The Academy is located at the Evergreen Aviation and Space Museum, and uses engineering and technology as a framework for cultivating students' knowledge and skills. Students also have internship opportunities and the option to pursue dual high school / college credit for advanced coursework, earning college course credit and satisfying high school graduation requirements. Students complete academic coursework in engineering and in core subjects

Enhancing Deeper Learning Skills

The Problem

Even in today's tough economy, American businesses are experiencing a shortage of employees with skills needed to compete in a global marketplace – in large part because those skills are not being developed in our high schools.

Skills Necessary for Success

To be equipped with the knowledge and abilities businesses now require, students must:

Master Core Academic Content

Students must be able to demonstrate a baseline understanding of core content knowledge and apply facts, processes and theories to real-world situations.

Think Critically and Solve Complex Problems

Students must be able to apply tools and techniques learned from core subjects to formulate and solve problems, using them to evaluate, integrate and critically analyze multiple sources of information. Students must be able to learn to reason and construct justifiable arguments creatively, encompassing non-linear thinking and persistence.

like English, social studies, and geometry, and also take on projects like aircraft restoration, automotive body design, or redesign of consumer products.³⁵

- In Eugene, Oregon, the Rachel Carson Environmental Science Academy, a school-within-a-school located at Churchill High School, students participate in individual and team-oriented field studies and action projects in surrounding natural areas. Students learn and apply skills that contribute to Lane County's environmental health, working with local natural resource professionals. These field-based experiences are designed to help students develop skills in teamwork, collaboration, personal management, and career development. At this Academy, students learn core academic subjects, and also can take courses in technical writing, ecology, and environmental law.³⁶

Through these promising models, Oregon high school students understand the skills they will need in a particular occupation and can make more informed decisions about post-secondary

Work Collaboratively

Students should demonstrate the ability to cooperate together to identify and create solutions to social, vocational and personal challenges. This includes the ability to identify common goals; to organize resources necessary for meeting group goals; and to learn to communicate and incorporate multiple points of view to better achieve goals.

Communicate Effectively

Students must be able to organize their thoughts and findings in clear, meaningful and useful ways and express themselves in both written and oral forms. They must be able to listen well and present others' concepts, as well as their own.

Learn How to Learn

Students must be aware of their strengths and weaknesses and be able to monitor and direct their own learning. They should understand and be prepared to meet changing expectations in a variety of academic, professional and social environments.

education and training. Whether they go directly into the workforce or pursue advanced education, these students will ultimately enter the workforce much more prepared to hit the ground running, potentially reducing the time and cost of on-the-job training.

Increased School Success

Increasing both Oregon's high school graduation rates and enrollment in post-secondary education and training programs are keys to cultivating a skilled workforce.

In a well-designed study of Career Academies across America, students were twice as likely as nonparticipants to be working in the computer, engineering or media technology sectors eight years after graduation, thus helping to increase the supply of STEM workers.³⁷

Earnings and Productivity

Models like Career Academies also have proven results for producing higher earnings, which are tied to productivity. Both

INNOVATIVE HIGH SCHOOL MODEL: Jefferson High School, Portland

Schools in Oregon that use innovative high school educational models are helping students develop the skills that today's businesses need. For example, the Margaret Carter Skill Center, housed on the Cascade Campus of Portland Community College, works in conjunction with Jefferson High School, Portland Public Schools and other partners to provide a career pathway for students in Airway Science. Over 24 years, the Margaret Carter Skill Center has helped youth obtain a high school diploma while providing workforce tools to build bridges to their future, self-sufficiency, and careers. The Skill Center provides a program that sparks young people's interest in science and technology, trains and develops students work skills, and assists students to comprehend life skills that lead to attainable and sustainable futures.⁴²

Students in the Jefferson High School - Middle College for Advanced Studies program combine high school and college coursework, supporting college

readiness as well as careers in Health Science/ Biotechnology and Digital Media/Video Production. Students complete their first two years of high school at Jefferson in small learning communities with the same set of teachers. Students in their junior and senior years can take college courses at PCC, earning a Jefferson High School Diploma and up to two years of college credit transferrable to other colleges and universities. The Middle College program was expanded to all students at the school in fall 2011.⁴³

The Jefferson High School - Middle College program has some initial promising results, with a 24 percentage point gain in the number of 10th graders who are on track to graduate. In 2010, 26 percent of 10th graders were on track to graduate, which increased to 50 percent on track in 2012.⁴⁴ The first graduating class to benefit from the full Middle College program will graduate in 2015.

increased productivity and higher earnings are good for the economy: increased productivity spurs economic growth, and higher earnings increase spending power and contributions to the tax base. The national study showed that:

- Young people who went through Career Academies earned 11 percent more than those not in the program.
- Young people from the program worked 12 percent more hours per week than those who did not participate.

Deeper Learning Educational Models

A number of schools around the nation have adopted educational approaches to promote deeper learning and help ensure that students focus on these critical problem-solving, critical thinking, communication and collaboration skills to be college- and career-ready. Included among the educational models that focus on developing these skills are Expeditionary Learning, EdVisions Schools, Big Picture Learning, and New Tech Network. Although evaluation research has not yet assessed the effectiveness of these models, their focus on these key learning skills that businesses need shows promise for helping students be better equipped for problem-solving, critical thinking, communication and collaboration.

In Oregon, there are several school models which focus on cultivating deeper learning skills.

- Expeditionary Learning (EL) is a comprehensive school reform model that uses project-based learning to help students cultivate critical thinking, problem-solving and collaboration. A hallmark of this school reform model is learning expeditions, which are interdisciplinary, real-world projects which serve as the primary curriculum units in EL schools. Student success is assessed using three indicators: academic achievement, quality of student work, and evidence of student engagement.³⁸ Expeditionary Learning has a network of 165 schools in 29 states, including 5 schools in Oregon: in Wilsonville, Hillsboro, Bend and two in Beaverton.³⁹
- The EdVisions school model provides self-directed, project-based learning for its students. The key elements of EdVisions schools are: small learning communities, self-directed project based learning, authentic assessment, and teacher ownership / democratic governance.⁴⁰ Edvisions schools operate in 50 schools in 12 states, including one Oregon, the Resource-Link Charter School in Coos Bay.⁴¹

Conclusion

Oregon runs the risk of falling further behind when it comes to preparing its future workforce to compete successfully in a global economy. To meet the future demands of a more skilled and educated workforce, policymakers should make sure we are spending our education dollars on what really works and include changes that will ensure young people enter the workforce with the skills Oregon businesses need. State school districts should be granted greater flexibility to incorporate proven or promising education models using deeper learning into their high schools. They can draw on their existing resources and state funding to follow these approaches. If we are serious about securing Oregon's economic future, we must act now to get Oregon businesses the skilled workforce we need.

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