Connecting to the World of Work

Science, Technology, Engineering, Arts and Math (STEAM)

The 21st Century demands that we provide Oregon's students not only with a solid foundation in literacy and math, but also with the skills, knowledge, experiences and social capital necessary to connect them to the world of work. Investing in science, technology, engineering, math and the creative arts is crucial to engaging and motivating Oregon's students to reach the 40-40-20 Goal. Competencies acquired through STEAM education—computer skills, basic math, problem solving, critical thinking, spatial awareness—are needed in a broad range of occupations and industries. Further, the "soft skills" acquired through STEAM education – such as perseverance, collaboration and creativity – are stronger indicators of future success in college and career than even mastery of basic content.

In addition, studies suggest that current STEM degree holders from outside Oregon outnumber those from within the state by a ratio of 2:1. To attract new business and industries to Oregon, we must improve the quality of Oregon's workforce by increasing the STEAM-related skills and knowledge of our graduates. Improving rates of proficiency in math and science, and improving the direct connections between Oregon's public schools and post-secondary institutions and the world of work, will increase Oregon's overall personal income and public revenue, thereby allowing for greater investment in education over the long-term.

Targeted investments could include: (1) STEM or STEAM lab schools for grades 6-14; (2) in-school and informal STEAM education opportunities designed to specifically engage underserved students; (3) programs and services that integrate academic, technical and workforce skills for young adults through hands-on, real world applications; and (4) research and strategies to drive new conversations and alignment between education and the economy.

Promoting Innovative 9-14 Models

Across high school and into community college, the system suffers both financial and human costs with the current inflexible and siloed approaches to delivering learning. Students who fail a course in high school or enter community college behind are required to repeat whole semesters rather than spending a few weeks or months demonstrating the skills or knowledge they lack. Students who could excel are held to the pace of the group, and may be asked to sit in study halls when they could be earning college credits through community college or on-line courses. Districts and community colleges should work together to design more individualized, innovative, flexible ways of delivering content, awarding credit, and tackling credit recovery and developmental education. Evidence is clear that students learn at their own pace and in their own way. Outcomes will be improved by offering opportunities for students to move more quickly through content they know, to dig in more deeply to content that engages them and to receive more directed support on the areas in which they struggle.

Oregon has an interest in supporting the creation of models that promote flexibility, innovation and individualized learning, while supporting a more seamless transition between high school and college. This investment will support models that:

- Include a consortium of district(s), community college(s) and 4-year institutions

- Promote more individualized, flexible, proficiency-based methods of delivering content and awarding credit for high school and post-secondary work; and
- Use innovative and engaging strategies and models such as competency-based, blended learning, project or community-based , or international studies.

Outcomes:

*By June 2015, increase the number of students who demonstrate proficiency in math and science in high school by X%, and decrease the achievement gaps by X%.

*By June 2015, Oregon's 5-year cohort graduation rate will increase by X%, and achievement gaps will decrease by X%.

*By June 2015, Oregon will increase the number of students who are graduating high school with 9 or more college credits by X% over the 2012-13 baseline (and decrease achievement gaps).

***Specific targets will be developed in conjunction with OEIB strategic plan**

Evidence:

Conley, D.T. (2010). College and Career Ready, Helping All Student Succeed Beyond High School. San Francisco, Josey-Bass

Harackiewicz, J.M, Barron, K.E., Tauer, J.M., & Elliot, A.J. (2002). Predicting success in college: A longitudinal study of achievement goals and ability measures as predictors of interest and performance from freshman year through graduation. *Journal of Educational Psychology, 94*, 562-575.

Hoffman, N. & Vargas, J. (2011). A PolicyMaker's Guide to Early College Designs: Expanding a Strategy for Achieving College Readiness for All. http://www.jff.org/publications/education/policymaker%E2%80%99s-guide-early-college-design/114

NGA Center for Best Practices (2011), *State strategies for awarding credit to support student learning,* National Governor's Association. http://www.nga.org/files/live/sites/NGA/files/pdf/1202EDUCREDITBRIEF.PDF

NGA Center for Best Practices (2012), *Using Community Colleges to Build a STEM-Skilled Workforce*, National Governor's Association, http://www.tiesteach.org/documents/Using%20Community%20Colleges%20to%20Build%20a%20STEM-Skilled%20Workforce.pdf

House Bill 3418: Interim Report to the 2012 Oregon Legislature, Task Force on Higher Education and Institutional Success. http://www.ous.edu/sites/default/files/state_board/jointb/files/HB-3418TaskForceReport12-12fin.pdf