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WASHINGTON STATE STEM EDUCATION INNOVATION ALLIANCE

2017 STEM Education Report Card

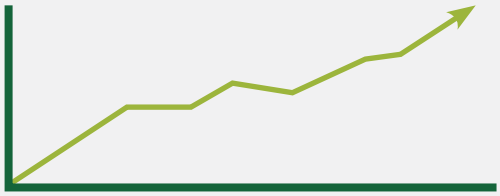
Additional information on STEM educational achievement and workforce needs in the state can be found in Washington's STEM Talent Supply and Demand Dashboard **(stem.wa.gov)**

WASHINGTON STUDENT ACHIEVEMENT COUNCIL
EDUCATION · OPPORTUNITY · RESULTS

THE STEM IMPERATIVE

Washington has one of the most dynamic economies in the nation, propelled by explosive growth in our STEM -driven technology sector. To allow the vital, innovative companies in this sector to grow and thrive, we must continue to develop the state's STEM education system to meet expanding and evolving workforce needs. **While moderate progress has been made in some areas in recent years, overall improvement in the STEM pipeline remains a statewide imperative.**

THE CHALLENGE



Our technology and innovation sector employers have a critical need for STEM-educated workers.

- Washington state **ranks #1 nationally** in the concentration of STEM related jobs,
- **#3 in STEM job growth**, and
- **#1 for Tech Innovation Capacity**

But STEM training and degree production in Washington is not keeping pace with demand.

- **Washington ranks low** in the production of computer science, engineering and health degrees relative to job openings in those fields.
- **Ranks 46th in the nation** and **next to last** among the top fifteen high-tech-intensive states in the proportion of high school graduates who go directly to college.

Thus employers are forced to import STEM-educated workers trained in other states.

- Washington is the **2nd largest importer** of degrees among tech states, and
- **1st among all 50 states** as a proportion of population

KEY STEM PROGRESS INDICATORS

STEM awareness.

In 2015, approximately 50% of Washington voters had heard of STEM, an increase from 32% in 2013.

Interest in STEM studies among high school students.

In 2016, approximately 31% of Washington SAT-takers indicated an intention to pursue a degree in a STEM major, an increase from 25% in 2010.

STEM achievement: Pre-school through K-12.

Kindergarten readiness in math

About 61% of incoming kindergarteners demonstrated "kindergarten readiness" in math among students assessed by WaKIDS, 2015-16.

Smarter Balanced Assessment math scores, 2015-2016:

- At the 3rd grade level, more than one-half **(58.9%)** of students met the math standard.
- At the 5th grade level, the percentage meeting standard was **49.2%.**
- At the 8th grade level, the percentage meeting standard was **47.8%.**

Student readiness for College-Level studies in STEM subjects:

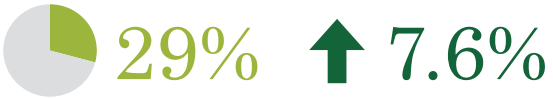
AP Computer Science:

- Only 11% (27) of Washington School Districts out of 295, and 42 high schools out of 760 currently offer AP Computer Science.

- Among districts where AP Computer Science is offered, less than 1 percent (1,205 students) completed the course in 2014 and of those 66% received a score of 3 or higher on the exam, consistent with college credit.

Alignment of STEM education programs with workforce demand in key economic sectors.

We have made progress in raising the number of Washington higher education graduates earning degrees in STEM fields, but the percentage is still too low to meet workforce needs. More than one-fourth **(29%)** of undergraduate degrees awarded at Washington **public baccalaureate** institutions in 2015 were in STEM subjects, **up from 21.4%** in 2010.



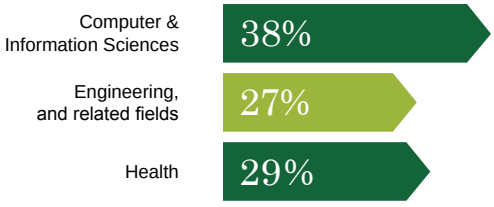
STEM degree completions have shown steady increases in recent years (2007 – 2013).

At the Associate Level:

- Degree completions in Health fields increased by 63%, in STEM fields by 59%.

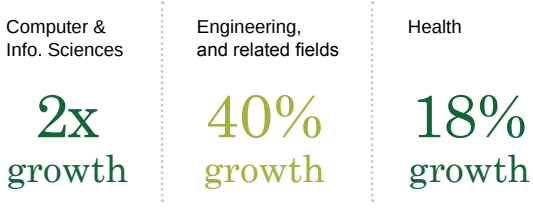
At the Baccalaureate Level:

- Degree completions in Computer and Information Sciences grew by 38%, in Engineering, Engineering and related fields by 27%, and in Health by 29%.



At the Graduate Level:

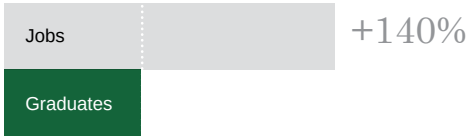
- Degree completions in Computer and Information Sciences more than doubled. Completions in Health grew by 40% and in Engineering and Architecture by 18%.

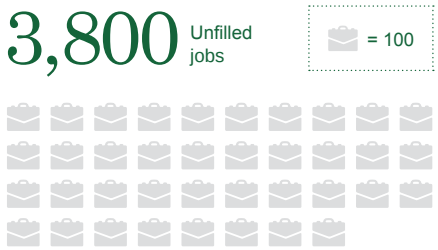


But rapidly growing workforce demand is still outpacing STEM degree production.

- There is a widening gap between projected annual job openings for computer scientists and the number of graduates in Washington prepared to fill them. The gap has been growing rapidly for the last decade.

- Projections for the years 2018 – 2023 estimate that:
  - The number of annual job openings in **Computer Science** at the Bachelor's and Graduate levels will exceed the number of graduates completing Computer Science degree programs by 140%. On an annual basis, there will be 3,800 more job openings in computer science than there are graduates completing degree programs.





  - The number of annual STEM job openings in **Engineering** will exceed the number of graduates completing by 31%.

Underrepresented populations in STEM.

A gender imbalance in STEM achievement tends to widen as students move through the pipeline.

- Among pre-K students, a higher percentage of girls than boys are demonstrating "kindergarten readiness" in math in WaKIDS assessments (61% of girls compared to 60% of boys in 2015-2016).

- As they move through the education pipeline, however, interest and achievement in STEM tends to fade for female students. 80% of all students completing AP Computer Science are male.

- Male students complete STEM degrees in much greater numbers than female students. In 2014, 62% of all students completing undergraduate STEM degrees in Washington were male.

Students from low income families are disadvantaged at all stages in the STEM pipeline.

- Among low-income pre-K students, only 49% demonstrated "kindergarten readiness" in math in 2015-16.

- In 2014, among students completing AP Computer Science courses only 14% were from low-income families.

POLICY RECOMMENDATIONS

The STEM Education Innovation Alliance is committed to devising innovative policies that will enhance STEM education and career pathways, advance economic development, meet our state's urgent workforce demands, and provide opportunities for more Washingtonians to compete for jobs in this vital high-wage sector.

Increase support for underrepresented populations in STEM fields.

- Expand opportunities to study math, science, and technology, such as those offered by Technology Access Foundation (TAF) courses.
- Invest in MESA to make it available at every Community College.
- Continue to support the Washington State Opportunity Scholarship.
- Provide greater access to advanced coursework, including dual credit programs, necessary for success in STEM majors.

Ensure our education system is STEM ready by providing resources to schools and teachers to provide a rich STEM experience for students, including quality computer science instruction.

Early Learning and Elementary

- Provide toolkits that link preschool and K-12 mathematics, support intensive teacher learning, and identify effective parent/family engagement resources.
- Enhance Teacher Learning Supports to encourage implementation of engineering practices and design challenges related to local industries.
- Create incentives to expand opportunities for students to develop computational thinking skills.
- Expand professional learning opportunities for K-8 teachers.

Middle and High School

- Make rigorous computer science instruction, such as AP Computer Science, available to students in every high school.
- Expand professional learning opportunities in computer science, including innovative programs like Technology Education and Literacy in Schools, Code.org, and the Pacific Education Institute.
- Increase opportunities for middle school students to earn high school credit in STEM fields.
- Broaden professional learning opportunities in STEM for educators and school leaders.
- Increase availability of computer science and other STEM-related endorsements for pre-service and in-service teachers.

Postsecondary

- Fund additional Computer Science and other high employer demand STEM enrollments.
- Maintain stable and predictable tuition and support state aid programs that address access and completion challenges for low-income students.

Expand opportunities for career-connected learning.

- Provide stipends or student aid for pre-apprenticeship students entering the Registered Tech Apprenticeship program developed by Washington Technology Industry Association.
- Expand apprenticeship opportunities into other high demand technology fields.
- Provide industry standard equipment and connectivity in all computer science classrooms.
- Enhance guidance and support through high school and beyond planning, advisory courses, work integrated learning opportunities, and jobs for Washington Grads.
- Increase funding for State Work Study and encourage colleges to create new mentor partnerships with K-12 schools.