STEM Talent: Increasing Demand, Decreasing Supply

Four Ways to Close the Gap

Presented by:
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Crispin Gravatt, Grants Coordinator, Idaho STEM Action Center
Today’s Agenda

• ACT and STEM: A History

• Driving ACT’s STEM Reporting: The ACT Policy Platforms

• Report Contents and Overview
  • Findings
  • Promising Practices
    • Spotlight: Idaho STEM Action Center
  • Policy Recommendations
ACT and STEM: A History

- ACT began examining STEM separately from our annual *Condition of College and Career Readiness* report with *The Condition of STEM 2013* four years ago.

- This year’s report takes more of a policy focus.

- The national and state reports are based on the 2,030,038 ACT-tested members of the high school graduating class of 2017.

- The U.S. report, as well as reports for the 50 states and the District of Columbia, can be found on ACT’s website at [www.act.org/STEM](http://www.act.org/STEM).
Driving ACT’s STEM Reporting:
The ACT Policy Platforms

- ACT’s 2018 policy platforms, released in January, reinforce the message that STEM education is critical to ensuring that students are able to succeed in a rapidly changing future and serve as a guide to ACT reporting on STEM issues.

- To check out the K-12, Higher Education, Career and Technical Education, and Workforce Development platforms, visit [www.act.org/policyplatforms](http://www.act.org/policyplatforms).
**STEM Areas**: Four key areas from our list of occupations and majors: Science, Computer Science & Mathematics, Medical & Health, and Engineering & Technology

**STEM Benchmark**: An average score of 26 on the Science and Math portions of the ACT, representing the level of readiness needed to succeed in college-level STEM classes

**Underserved Learners**: ACT examines the student characteristics of underserved minority, first generation in college, and low parental income level
**Expressed Interest:** A student’s expressed major or occupation, chosen during registration for the ACT test

**Measured Interest:** Based on the results of the ACT Interest Inventory, completed during registration for the ACT test

**Key Terms**
Finding 1:

STEM interest and achievement in the U.S. have changed little in the past five years.

Percentages of ACT-tested high school graduates interested in STEM, 2012–2017

- 2012: 48%
- 2013: 48%
- 2014: 49%
- 2015: 49%
- 2016: 48%
- 2017: 48%
Finding 1:

STEM interest and achievement in the U.S. have changed little in the past five years.
Finding 2:

Expressed or measured interest in STEM is associated with higher levels of college readiness in STEM-related subjects.
Finding 3:

Expressed or measured interest in STEM is associated with higher levels of college readiness in STEM-related subjects; however, college readiness in STEM is even higher among students with both an expressed and a measured interest in STEM.

Percentages of ACT-tested 2017 high school graduates who met the ACT STEM Benchmark, by STEM interest type:

- **Expressed Only**: 23%
- **Measured Only**: 20%
- **Both**: 33%
Finding 4:

The nation’s STEM education and teacher pipeline signals challenges ahead.

Percentages of ACT-tested 2017 high school graduates with an interest in STEM who plan to pursue a college major or occupation in math education or science education:

0.43% | 0.17%

MATH EDUCATION | SCIENCE EDUCATION
Finding 5:

Underserved students are at a huge STEM disadvantage.

<table>
<thead>
<tr>
<th>No. of Criteria</th>
<th>Percentages</th>
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<tbody>
<tr>
<td>ZERO</td>
<td>32%</td>
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<tr>
<td>ONE</td>
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<tr>
<td>TWO</td>
<td>5%</td>
</tr>
<tr>
<td>THREE</td>
<td>2%</td>
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</table>

Percentages of ACT-tested 2017 high school graduates who met the ACT STEM Benchmark, by number of “underserved” criteria met.
Finding 6:

Gender gaps in STEM continue.
Finding 7:
Students need access to core STEM courses.
Finding 8:

Geographic differences exist in STEM achievement.

Percentages of ACT-tested 2017 high school graduates interested in STEM who met the ACT STEM Benchmark, by location of high school:

- RURAL: 17%
- TOWN: 18%
- SUBURBAN: 33%
- URBAN: 27%
Promising Practices
Connecting STEM education and industry to ensure Idaho’s long-term economic prosperity.

Engineering innovative STEM opportunities for educators, students, communities and industry to build a competitive Idaho workforce and economy.

Idaho STEM Action Center
Facts About Idaho Jobs

100% of Idaho industry believe employees should possess both technical and 21st century skills.

Idahoworks.gov has over 20,000 job openings with ~5,000 that are hard-to-fill, open for 90+ days.

Idaho has the fastest population growth, the 3rd fastest job growth, and 2nd fastest tech sector growth.
Facts About Idaho Jobs

- Within 20 years, **80% of jobs** will require skills in **technology**.
- Idaho's tech sector is the second fastest growing in the nation at **6.3%**.
- In Idaho, **STEM jobs** are expected to grow **23% by 2024**.
- 16 of the 20 **fastest growing** careers in Idaho require **STEM skills**.
In 2017, 6,992 STEM jobs were unfilled in Idaho, resulting in nearly $420 Million of unclaimed personal income.

If these STEM jobs were filled, state tax revenues would increase by nearly $24 Million.

Idaho's STEM jobs pay well, double the median wage of non-STEM jobs.
As Legislated in Idaho Code (Idaho Code §67-823, §33-1633, and §33-4701)

- Support high-quality STEM and CS **professional development** for educators
- Distribute **grants** to students, educators, and communities
- Engage **industry** to support STEM/CS education outcomes
- Support student STEM and CS **competitions**
- Support STEM and CS **pilot projects**
- Serve as a **resource** center for instructional materials and best practices
- Support **traditionally underrepresented population** in STEM and CS
- Identify and recognize high quality **STEM Schools**
- **Work well with other** agencies and partners!
Legislated Goals of STEM AC

• **GOAL #1**: Coordinate & facilitate implementation of STEM programs throughout Idaho

• **GOAL #2**: Align education and workforce needs throughout Idaho

• **GOAL #3**: Increase awareness of STEM throughout Idaho
GOAL #1: Coordinate & facilitate implementation of STEM programs throughout Idaho

- **Professional Development** - High quality STEM/CS PD (next slide)
- **Grants**: PK12, CS Device, Camps, Competitions, Family/Career STEM Events, and Sponsorships
- **Camp Scholarships**: STEM, CS, and Coding
- **Competitions**: Next slide
- **Awareness Events**: Family Day at the Fair, STEM Matters Day at Capitol, and Hour of Code
Professional Development

- i-STEM Summer Institutes
- ISEF PD, travel and materials grant
- BotBall Robotics PD and Materials
- FabSLAM – 3D Fabrication PD and Showcase Events
- AP and Dual Credit PD
- Idaho Math and Science Conference PD
- Code.org PD
- Drones PD and Resources
- Virtual Reality PD and resources
- Edison Community Robotics
- Making Sense of Science
- Educurious
- FIRST Robotics
Student Competitions

• Regional Idaho Science and Engineering Fairs
• FIRST Robotics Expansion Grant & Student Travel Grants
• FabSLAM – 3D Fabrication Middle School Competition
• BotBall Competitions (Regional and International)
• Invent Idaho’s Lead Sponsor
• CTE student competition travel
• Future Cities competition and travel
• Drone Competition
• Science Bowl
• Congressional App Challenge
• Math Counts
• Khan Academy LearnStorm
GOAL #2: Align education and workforce needs throughout Idaho

- Workforce Development Council, Apprenticeships, Internships, Mentorships
- Project-Based Virtual Mentorship Platform (slide later)
- INDEEDS Award for excellent STEM educators
- Hour of Code, Code.org, and IDLA
- CS Co-Op, Higher Ed and Industry
- CS dual credit training
- Expansion of *I Do Code* CS teacher endorsement
What is the STEM AC Foundation Role?

- Create 501c3/Foundation Status
- Monetary Donations
- Cash Equivalent and In-Kind Support
- Apply for Grants
- Raise awareness of the need for STEM education and opportunities
GOAL #2: Align education and workforce needs throughout Idaho
Donors – Anticipated Total by Feb. 2018 (Over $600K)

- INL - $270K in process
- Micron - $174K in process
- Dept. of Ed i-STEM Support – $58K
- Andeavor (formerly Tesoro) - $25K
- ICfL – $23K
- Dutch Brothers - $23K
- Cable One - $10K
- INDEEDS Sponsorships (10 sponsors) – $10K
- Power Engineers - $2K
- Individual Donors (22) - $10K
- In talks with Simplot, Clearwater, Verizon, Fluor, Switzer, etc.
GOAL #2: Align education and workforce needs throughout Idaho

Top 5 Programs Donors are Choosing

- **Educator PD and Resources:** $305K
- **Camp Support:** $185K
- **Competitions:** $77K
- **Family STEM Events:** $11K
- **INDEEDS Teaching Awards:** $10K
In-Kind Total

• Over $1.1M as of February 1, 2018 (7 months)

• In the areas of judges, mentors, industry partnerships, awareness events, and media coverage
GOAL #3: Increase awareness of STEM throughout Idaho

- **Presentations**: Local, state, and national
- **Interviews** on radio, news, blogs, and magazines
- **Sponsorships of Key Events**: Hispanic Youth Conference, Inspire to Hire, IASA, ISBA, Super Conference, Western Idaho Fair, Gowen Thunder, Lights On Afterschool, etc.

- **Grants**: Family STEM Awareness and Career Awareness
- **National STEMx** Board Member
- **Governor’s Designee** on Workforce Development Council
Data From Family STEM/Career Awareness Events

**Students**
- 36% increase in awareness of STEM careers
- 83% want to study STEM in post-secondary
- 95% say STEM is fun!

**Parents**
- 92% believe their community should invest more in STEM
- 99% would like their child to pursue a STEM career
- 98% want their child to have access to a mentor
Virtual, Project-Based, Statewide Mentorship Platform

• Focused on student projects, especially related to competitions
• Industry and higher ed support for educators whose students are working on projects that could benefit from additional outside-the-classroom support
• One of the most powerful tools for retention of students (especially females) in STEM is having a strong mentor
• Available NOW!
• https://mentorship.stem.idaho.gov/
GOAL #3: Increase awareness of STEM throughout Idaho

Impact data map available:
• Map contains funding opportunities and legislative districts for all funded opportunities

Other Impact Number

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<th>FY17</th>
<th>FY18 (estimates)</th>
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<td>Student Engagements</td>
<td>10,428</td>
<td>210,000</td>
<td>210,000+</td>
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<tr>
<td>Educator Engagements</td>
<td>1,200</td>
<td>4,800</td>
<td>5,000+</td>
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<td>Community STEM Events</td>
<td>36</td>
<td>45</td>
<td>75+</td>
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<td>Cash</td>
<td>$72,000</td>
<td>$205,000</td>
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<td>In-Kind (and cash equivalent)</td>
<td>Did not track</td>
<td>$662,000</td>
<td>$1,100,000+</td>
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Stay In Touch!

• Visit our **Website**: STEM.Idaho.gov
• Like Us on **Facebook**!
• Follow Us On **Twitter** @IdahoSTEMAC
• Sign up for our monthly **e-newsletter**
• Get Involved
Crispin Gravatt
- Grants Coordinator
- STEM Action Center
- Executive Office of the Governor

Phone: 208-332-1722
Email: grants@STEM.Idaho.gov
Questions? Ideas? Feedback? Suggestions? What are we missing?
Policy Recommendations

1. Ensure that state graduation requirements emphasize the importance of rigorous science and math courses for all students.

**ACT’s challenge to states by the end of 2022:**
Double the number of states requiring all high school students to take three rigorous mathematics courses and three rigorous science courses.
2. Pay teachers more.

**ACT’s challenge to states by the end of 2022:**
Increase teacher starting salaries by a minimum of 10% per year with additional stipends and/or bonuses to attract math, engineering, and science majors that make teaching STEM courses competitive with entry-level engineering salaries.
3. Establish a loan forgiveness program for STEM teachers.

ACT’s challenge to the federal government by the end of 2022:
Create and financially support a federally-matched loan forgiveness program to improve the pipeline of STEM teachers.
4. Provide equitable access to both high-quality math and science courses and real-world work experiences for all students via dual enrollment programs.

**ACT’s challenge to states by the end of 2022:**
Double the number of STEM-oriented public-private dual enrollment partnerships in order to provide needed—and equitable—access to STEM instruction, especially for rural and urban students who lack the access of their suburban peers.
Questions?

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