Can Arizona seize the future?

Enlist 2.0

October 7, 2015
Opportunity lost?

Arizona State Rank

STEM job growth

Computer job growth

STEM employment advantage

STEM wage premium

Preparation for STEM jobs

AP math success

AP science success

Access to science lab materials

Diversity of computer graduates

Time for science in grade school

STEM degrees/certificates

Access to science teachers

Math teaching resources

Science teaching resources

Afterschool opportunities in STEM

Access to math teachers
Arizona could have a bright future in STEM
Arizona leads in STEM growth

Between 2014 and 2024:

Arizona
STEM jobs will grow

23%

▲ 27% Computing
▲ 17% Engineering
▲ 23% Advanced Manufacturing

U.S.
STEM jobs will grow

16%

▲ 19% Computing
▲ 12% Engineering
▲ 16% Advanced Manufacturing

Arizona rank: 4

AZ leads in STEM wage premium

Median earnings in Arizona STEM jobs are:

$36.62/hour

Median earnings in Arizona all other jobs are:

$17.64/hour


Arizona rank: 9
AZ leads in STEM employment advantage

STEM and non-STEM Unemployment rate, 2011-2014

Arizona: 2.5% (STEM), 8% (non-STEM)
United States: 3.1% (STEM), 7.4% (non-STEM)

Source: U.S. Census Department, 2011–2014

Arizona rank: 5
Yet Arizona might not have the people to realize this future
AZ lags in STEM credentials

What percentage of certificates and degrees is in STEM fields? (2012-2013)

21.6% Arizona

23.9% United States

Arizona rank: 43

SOURCE: U.S. Department of Education
AZ lags in STEM diversity

Underrepresented minorities in computing

Arizona rank: 41

AZ lags in STEM diversity

Underrepresented minorities in engineering

Arizona rank: 22

46% of Population...

...but only 14% of degrees

Students lack opportunities and exposure in K-12
AZ lags in time for science

Time for science in grades 1-4

Arizona rank: 41


Only 2 hours per week!
AZ lags in teacher preparation

8th graders whose math teachers have an undergraduate major in math, by race/ethnicity, 2013

Arizona rank: 50

SOURCE: U.S. Department of Education 2013
AZ lags in teacher preparation

8th graders whose math teachers have an undergraduate major in math, by race/ethnicity, 2013

Arizona rank: 44

SOURCE: U.S. Department of Education 2011
AZ lags in teaching resources

8th graders whose science teachers say they have all or most of the resources they need, by race/ethnicity, 2011

Arizona rank: 46

AZ lags in teaching resources

8th graders whose science teachers say they have all or most of the resources they need, by race/ethnicity, 2011

Arizona rank: 46

AZ lags in science supplies

8th graders whose schools report that supplies or equipment for science labs are available “to a large extent,” by race/ethnicity, 2011

Arizona rank: 39th

AZ lags in afterschool STEM

Arizona

Parents report that their child’s afterschool program offers STEM learning opportunities

46%

U.S.

Parents report that their child’s afterschool program offers STEM learning opportunities

69%

SOURCE: Afterschool Alliance, America After 3pm, 2015

Arizona rank: 46
Mentoring can be one critical means of filling the gap
Arizona State University Modeling Instruction and Master of Natural Science Programs

The Master of Natural Science (MNS) degree and the Modeling Instruction Program are two innovative and successful approaches to science teacher development in Arizona. At a time when most of the state’s physical science teachers are teaching out of field, these programs improve learning and achievement of K-12 students in science and mathematics by providing model-centered professional development for teachers in grades 8 through 12.
STEM Design Principles

- Need
- Inquiry & Hands-on Learning
- Underrepresented Groups
- Evaluation
- Capacity
- Inspiration
- Replicable
- Sustainability
- Partnerships
- Content
Champions for Change

"Doing this is a real benefit for UASC as well. It reminds us why we love our jobs and that what we do means something."

-- Paul DeHerrera, COO, Universal Avionics Systems Corporation, C4C mentor

Program Type
Hands on/Project-Based
Work Readiness/Employment

Target Audience
All Students

Location
Arizona
Tucson

Grades
Grades 6 - 8
Grades 9 - 12

Program Impact
The C4C program reaches more than 124 teachers and 8123 students. C4C is working to improve the quality of STEM education in the community will be able to do even more outreach to underrepresented classrooms and address STEM needs with the help of industry partners and STEM professionals in the fields of engineering, technology, architecture, design, science, math, and more.
Teachers in Industry

"I have been able to bring more real work significance and references to my teaching. I have more knowledge about how the industry works, which allows me to use it as a reference to STEM related concepts and make real world connections."

-- Teacher

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Target Audience</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Teachers/Educational Leaders</td>
<td>Arizona</td>
</tr>
<tr>
<td>Development/Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Readiness/Employment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grades

- Grades 6 - 8
- Grades 9 - 12

Program Impact

Our vision is to enroll 10 -15 new Master's teachers and 15 -20 professional development teachers each year, so each summer 50-75 teachers experience high-quality STEM work experiences in their local communities. Our participants increase in their knowledge and implementation of 21st century skills and their students.
Contact Information

Claus von Zastrow
cvononzastrow@changetheequation.org
202.626.5740

www.changetheequation.org
Facebook.com/changetheequation
Twitter.com/changetheequation