

GREATNESS[®] STEMS FROM IOWANS

GOVERNOR'S STEM ADVISORY COUNCIL

Iowa STEM Evaluation Report 2018-2019



Iowa STEM INDICATORS

These indicators are provided by the external evaluation team consisting of University of Northern Iowa's Center for Social and Behavioral Research, Iowa State University's Research Institute for Studies in Education and The University of Iowa's Iowa Testing Programs.



- In 2018-2019, STEM Scale-Up Program participants performed better on the Iowa Statewide Assessment of Student Progress (ISASP) compared to all students statewide. On average, 2% more STEM Scale-Up Program participants met or exceeded proficiency benchmarks in mathematics and science.
- In both mathematics and science achievement, the average percentages of proficient students in the 2016-2018 biennium period are higher than the 2011-2013 biennium period among 8th grade students.
- In 2018, Iowa's average ACT score was 21.2 in mathematics and 22.0 in science, compared to 20.5 and 20.7 nationwide, respectively. The average Iowa STEM score was 21.8 compared to 20.0 nationally.
- From 2013 to 2018, the number of students taking advanced placement courses in STEM-related subjects increased 22% from 5,355 to 6,527.

- The percentage of enrollment in most STEM subject areas has increased annually in the last five years among underrepresented minority students.
- From 2013-2016, Iowa high school graduates who took part in the STEM Scale-Up Program were 22% more likely to major in a STEM field for those enrolled in an Iowa Regent University and 5% for those enrolled in an Iowa community college, compared to their counterparts who did not participate in Scale-Up.
- The number of STEM-related degrees awarded to African-American students rose 41% at 4-year public, and 13% at private, 4-year not-for-profit colleges and universities in Iowa since 2012-2013, maintaining stable at 2-4% of all degrees per year. The number of STEM-related degrees awarded to students who are Hispanic rose 111% at 4-year public and 28% at private, 4-year not-for-profit colleges and universities in Iowa for the same time period.

- Community college STEM diplomas, certificates and degrees increased 13% among white graduates and 31% among minority graduates compared to 2013.
- In 2018, there were an estimated 14,280 vacancies in STEM jobs statewide.
- A higher percentage of students who participated in STEM Scale-Up Programs said they were very interested in working in Iowa after completing their studies compared to students statewide.
- In 2018-2019, 81% of all students statewide indicated they were very interested or somewhat interested in pursuing a STEM career.
- Iowa STEM occupations, which comprise 21% of all Iowa jobs, are expected to grow 1.0% annually from 2016 to 2026 compared to .8% annual growth across all occupations.
- STEM jobs pay an average of \$22,330 higher per year (\$67,057 in STEM versus \$44,727 for all other).

STEM SCALE-UP PROGRAM

The STEM Scale-Up Program provides high-quality STEM education programs to PreK-12 youth in school and out of school along with training for educators to implement effectively.

A total of 1,180 educators delivered at least one of ten world class STEM Scale-Up Programs in 2018–2019.

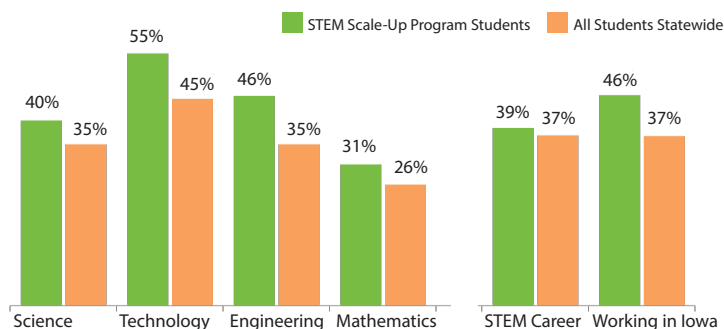
An estimated 80,000 preK–12 youth participated in one or more Scale-Up programs in 2018–2019.

Since 2012, an estimated 542,928 preK–12 Iowans have participated in STEM Scale-Up programming.

94% of educators taking part in STEM Scale-Up programming agreed or strongly agreed that they now have more confidence to teach STEM topics and have increased their STEM knowledge.

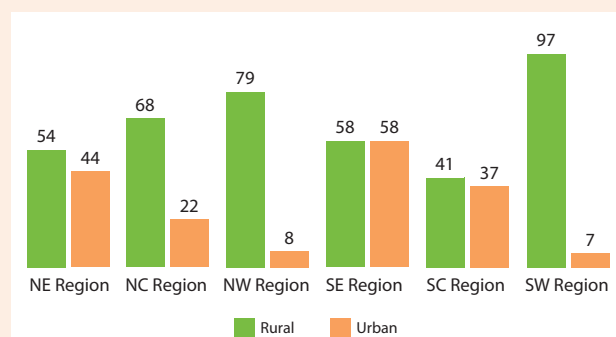
90% of educators reported that they will be using the STEM Scale-Up Program with their students again next year.

STUDENT INTEREST IN STEM



A higher percentage of students who participated in STEM Scale-Up Programs said, “I like it a lot” or were “very interested” in STEM-subjects, as well as in pursuing a STEM career and in working in Iowa after graduation compared to all students statewide.

RURAL AND URBAN AWARDS

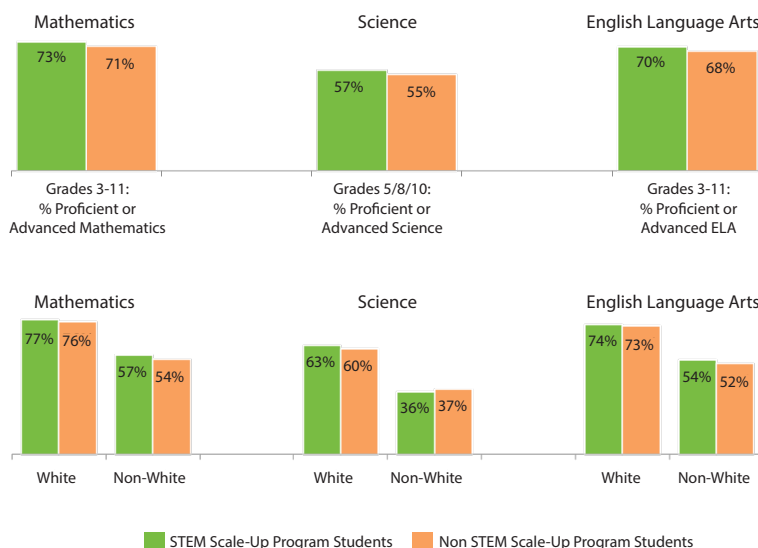


Urban communities include 49 communities in Iowa listed as “urbanized areas” by the U.S. Census Bureau and communities with a population of 20,000 or greater.

STUDENT ACHIEVEMENT AT PROFICIENT OR ADVANCED LEVEL

STEM Scale-Up Program participants performed better on the Iowa Statewide Assessment of Student Progress compared to students who did not receive STEM Scale-Up Programming. In 2018-2019, 2% more STEM Scale-Up Program participants met proficient or advanced level benchmarks in mathematics, science and English language arts.

For minority students, 3% more STEM Scale-Up Program participants met proficient or advanced level benchmarks in mathematics and English language arts compared to minority students who did not participate; however, this trend was not observed in science.



STEM BEST®

BUSINESSES ENGAGING STUDENTS & TEACHERS

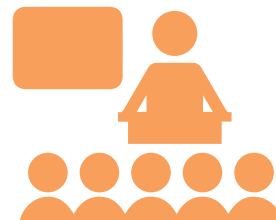
School+business partnerships that provide work-based learning experiences for students.



Thirteen STEM BEST partnerships were established in 2018–2019, involving 21 school districts and 164 community partners. A total of 63 STEM BEST awards have been made since 2014.



Estimated cost-share dollars contributed in 2018-2019 collectively totals to more than \$550,000.



Approximately 1,837 students participated in STEM BEST in 2018-2019.

STEM BEST EXAMPLES



GRAETTINGER-TERRIL, OKOBOJI AND RUTHVEN-AYRSHIRE SCHOOL DISTRICTS:

These northwest Iowa school districts have cultivated over twenty partnerships to create authentic work-based learning opportunities for their middle school students and have intentions to expand opportunities to high school students.



CAM SCHOOL DISTRICT: Providing students the opportunity to be “work-force” ready and develop their soft skills set has been a wonderful outcome for the students at CAM. The popularity of the course has led to the addition of a section of Digital Media to be offered in the next academic year.



OTTUMWA SCHOOL DISTRICT: The SparkTank Program relies on strong local business ties to form an Advisory Council that provided guidance and assistance leading to a new strand offering, “SparkTank Ignite.” This strand covers multiple career clusters using authentic learning opportunities and allows for a more diverse interest group.

Microsoft Imagine Academy

A total of 11,578 Microsoft Imagine Academy student certifications have been awarded since 2014. A total of 2,102 certifications were awarded in 2018-2019 plus 83 Microsoft Technology Associate (MTA) certifications. The MTA certification exams are new for IT Infrastructure and Data Science.

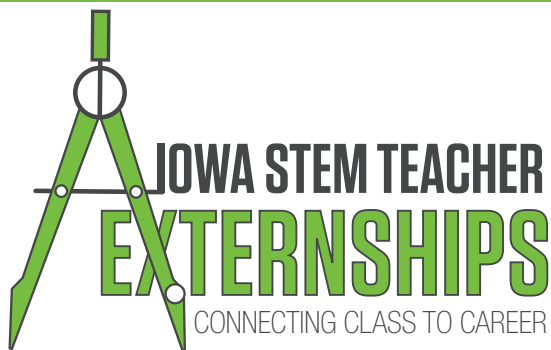
5 students earned Master Certifications (the top certification available in the program).

2 students qualified for Nationals in Word and Excel.

1 teacher earned Microsoft Certified Educator.

150 high schools and community colleges are participating.

TEACHER EXTERNSHIPS



Connecting classrooms to careers through the immersion of secondary STEM educators engaged in workplace settings for six weeks in the summer.

Total STEM Teacher Externships
2009 to 2019

578

Total Workplace Partners
2009 to 2019

181

Total approximate cost-share by workplace hosts
from 2009 to 2019

\$891,400

(\$129,700 this year)

2019 RESULTS:

Of 2019 employers surveyed, most monetized the value of an extern between \$2,500-\$10,000.

Of host employers surveyed in 2019, most valued outcomes included:

- Workplace relevance brought to schools
- Establishment of school-business partnerships
- Increased interest of the future workforce
- Elevated awareness of their business in the community

Top reasons that 2018 teachers gave for participating included:

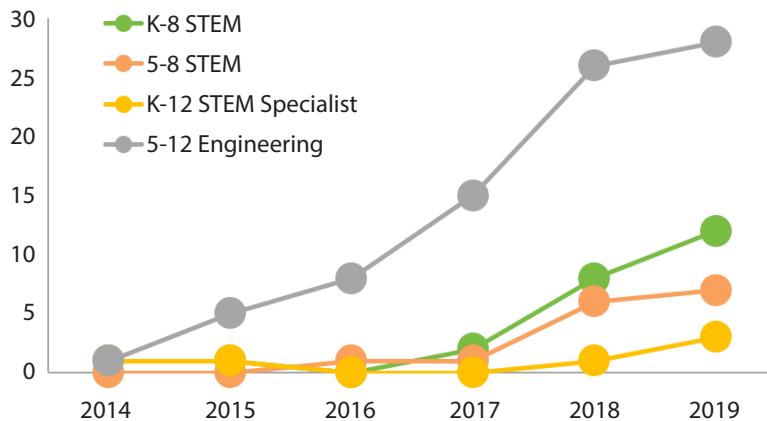
- Bring relevance to content taught in the classroom by seeing how it's used in the workplace
- Summer employment/income
- Learn more about the skills students need in today's workforce
- Make connections in the community

CHALLENGES AND OPPORTUNITIES

- In science achievement, the average percentage of proficient students in the 2016–2018 biennium period is lower than the 2011–2013 biennium period among 11th grade students.
- Among all students statewide, interest in STEM careers declines steadily from grade 3 to grade 11, a trend more pronounced for females than for males.
- 2018 STEM career interests remain strongly gendered with the top five two-year college majors for females in health-related fields (nursing and radiologic technology), animal sciences, veterinary medicine (pre-vet) and zoology. While for males the top five majors were electrical/electronic engineering, animal sciences, computer engineering technology, computer science and programming and agronomy and crop science.
- The proportions of minority students, those of low socioeconomic status and students with disabilities who demonstrate proficiency are consistently lower than the overall rates. This is true in all biennium periods, all grade levels and in both mathematics and science. Proficiency in science has declined the most among students in the 11th grade who are African-American from 60% in 2011–2013 to 46% in 2016–2018.
- The number of underrepresented minorities in STEM fields is encouraging with a higher proportion of students who are very interested in STEM careers among students who are African-American, Hispanic or Asian compared to white students in grades 3 to 6. However, maintaining that early interest in high school is challenging. The proportion of Asian students who are interested in STEM is maintained, while interest decreases by 7% for white students, 16% for African-American students and 13% for Hispanic students in grade 11.

STEM TEACHER ENDORSEMENTS

STEM teaching endorsements are now offered at seven institutions in Iowa: Buena Vista University, Drake University, Dordt University, Grand View University, Morningside College, St. Ambrose University and the University of Northern Iowa. A number of other institutions are developing courses in preparation to offer the endorsement. A total of 45 Iowa educators are endorsed in STEM and 80 in engineering.

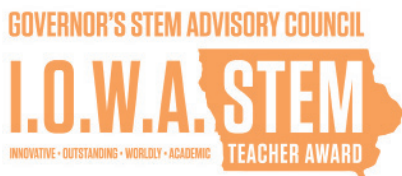


Since 2014, a total of **125** STEM endorsements have been granted:

24 for K-8 STEM
15 for 5-8 STEM
6 for K-12 STEM Specialist
80 for 5-12 Engineering

In 2019, 50 STEM endorsements were granted:

12 for K-8 STEM
7 for 5-8 STEM
3 for K-12 STEM Specialist
28 for 5-12 Engineering



30

have received
the I.O.W.A. STEM
Teacher Award
since 2015



Most awardees believe the
recognition has a lasting
effect on students', parents'
and colleagues' confidence in
their teaching



21

programs have
earned the Seal
of Approval since
2015



Most report that the
recognition validates their
program or event and helps
in grant proposals or other
source funding

STEM COMMUNICATIONS

SOCIAL MEDIA



Twitter: **3,542** followers
Up **10%** from last year



Facebook: **1,293** likes
Up **14%** from last year



Instagram: **386** followers
Up **47%** from last year



YouTube: **6,100** views
37,900 impressions



Newsletter: **6,889** readers
Up **2%** from last year



LinkedIn: **371** followers
Up **16%** from last year

Other social media includes Pinterest.

WEBSITE

www.iowaSTEM.gov

125,585 page views
Up **9%** from last year

32,842 new visitors
Up **21%** from last year



148 countries



52 states and territories



421 Iowa cities

MEDIA COVERAGE

Total PR efforts resulted in **605 placements** in newspaper, television and radio outlets over the course of the year in local, statewide and national media coverage, appearing before potentially **284 million** eyes.

Compared to the previous year (2017-2018), coverage has **increased by 7%**.

46% of media coverage included a specific STEM example or story in the state, and **75%** of the coverage mentioned the efforts of the Iowa Governor's STEM Advisory Council.

PUBLIC ATTITUDES AND AWARENESS OF STEM

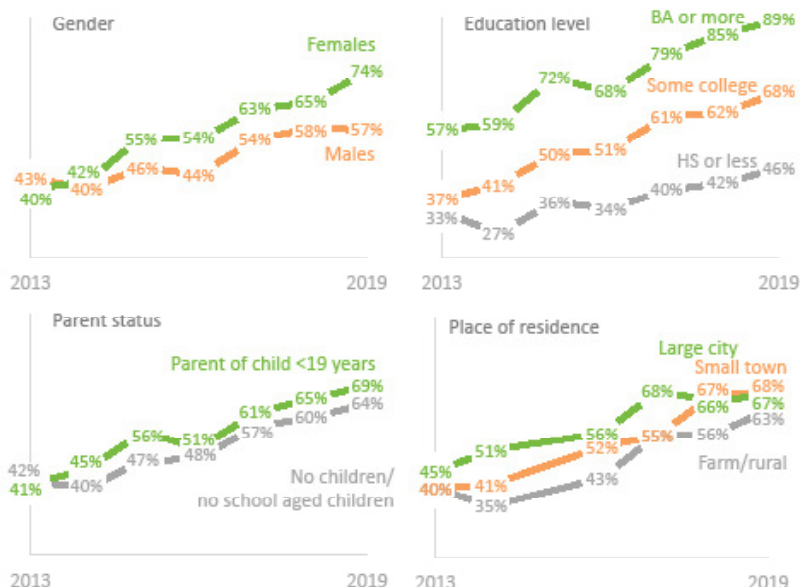
Two-thirds of Iowans (66%) had heard of the acronym STEM. This is an increase of 25 percent compared to 2013.

In 2019, 95% of Iowans agreed that STEM education should be a priority in their local school district.

Nearly 9 out of 10 support state efforts to devote resources and develop initiatives to promote STEM education in Iowa.

Only 58% said STEM education actually is a priority and another 13% said they didn't know if STEM education was a priority in their local school district.

By subject area, approximately 7 out of 10 Iowans rated the quality of science, technology and mathematics education in their community as excellent or good.



IOWA'S STEM NETWORK

CORPORATE PARTNERS AND INVESTMENTS

\$1.9 MIL

A total of **\$1,911,789** in grants, corporate partner gifts and cost-sharing by other STEM partners was invested in Iowa STEM for 2018–2019.

\$704K

48 corporate partners contributed **\$704,042** to Iowa STEM in 2018–2019. Investors are listed at www.iowaSTEM.gov/corporate-partners.

\$116K

A total of **\$116,992** in grants from the Iowa Department of Natural Resources, the U.S. Department of Labor/Iowa Workforce Development and the National Science Foundation supported Iowa STEM in 2018–2019.

\$1 MIL

Cost-sharing partners, including Strategic America, Regional STEM Hub Institutions, STEM Teacher Externship workplace hosts, STEM BEST partners and STEM Scale-Up Program providers contributed **\$1,090,754** to Iowa STEM in 2018–2019.

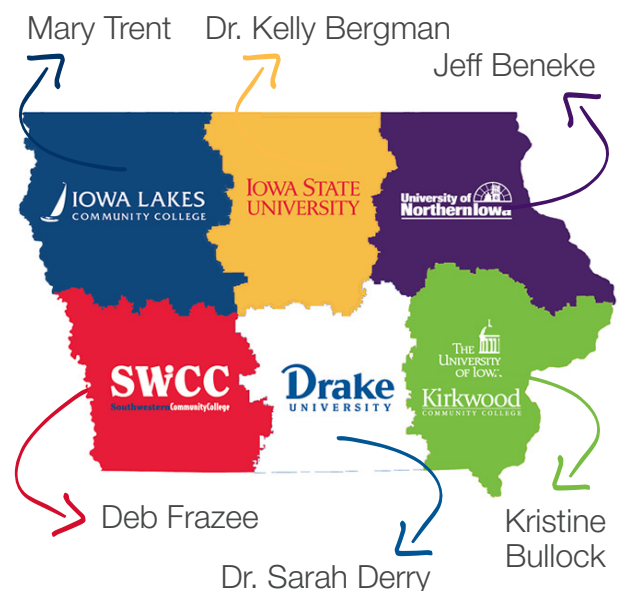
REGIONAL STEM

Regional STEM managers facilitated **10 STEM Scale-Up Programs** that impacted **80,150 preK–12 youth** and **1,180 educators** in 2018–2019.

Managers held a total of **64 community STEM Festivals** across Iowa, engaging approximately **24,000 Iowans** in 2018–2019.

Managers made a total of **726 new connections** with businesses, workforce development, economic development and formal/informal education leaders.

Collectively, Iowa's Regional STEM managers have **14,307 newsletter subscribers**, **5,297 Twitter followers** and **2,285 Facebook likes**.



EVENTS

Governor's 2019 Future Ready Iowa Summit

Hosted by the STEM Council and Future Ready Iowa, this event brought together leaders from business and industry, education, nonprofits, elected officials, students and others to expand access to work-based learning opportunities to help more students prepare for future careers.

- 1,029 Registrants
- 22 General Session Speakers
- 20 Speed Showcase Exhibits
- 21 Sponsors
- 35 Media Outlets Covered the Event

STEM Day at the Iowa State Fair

The eighth year of STEM Day at the Iowa State Fair covered 5,000 square feet on the Grand Concourse with many exciting demonstrations and hands-on STEM activities for students and families. Held on the last day of the Iowa State Fair, as many as 10,000 Iowans interacted with STEM exhibits throughout the day.

- 23 Exhibits
- 5 Stage Acts
- 359 Volunteers
- 6 Sponsors
- Approximately 5,000 Backpacks Distributed
- 5 Media Outlets Covered the Event