

**TOMORROW
STEMS
FROM IOWA**

GOVERNOR'S STEM ADVISORY COUNCIL

Iowa Governor's STEM Advisory Council Meeting

January 21, 2022

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Rob Denson

DMACC President

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Diane Young

Foundation Analytical Laboratory Owner and Director of
Technical Services and STEM Council Co-Chair

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STEM Regional Hubs

 **IOWA LAKES**
COMMUNITY COLLEGE

**IOWA STATE
UNIVERSITY**

UNI / University of
Northern Iowa

SWiCC
Southwestern Community College

Drake
UNIVERSITY

 **THE UNIVERSITY
OF IOWA**

Kirkwood
COMMUNITY COLLEGE

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Ankeny Schools: Orbis



ORBIS

PROJECT BASED EXPERIENCE

Ankeny Community Schools

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Ankeny Service Center Orbis Project

Weeks 1 - 3: Learn Phase

We spent this time learning about the different non-profit organizations and the true needs in Ankeny. This research included:

- Finding the ongoing issues in Ankeny, such as food, housing, and rent.
- Learning nonprofits had to move out of the Neveln center and each had to pay for their own space.
- The desire to combine resources to improve accessibility and affordability.
- The dependency on volunteers

Weeks 4-7: Ideate

We agreed on the need for a shared nonprofit space. We also looked a lot at the West Des Moines Social Services location and that gave us ideas for what we could do in Ankeny. We then created an idea of the perfect shared space for the nonprofits. Here are the ideas we came up with:

- In older Ankeny - near lower-income housing
- Lots of storage
- Meeting rooms
- One big fundraising spot
- Place for events
- Sharing internet, phone line, staff, printing, etc.

We began to brainstorm ideas of services that the new nonprofit center could provide:

- Food
 - Clothing
 - Home repair
 - Tool rental
 - Pet supplies
 - Personal care
- Therapy
 - Treatment for substance abuse
 - Job help
 - Emergency housing
 - Furniture
- Transportation
 - Nurse/health care
 - Bill/payment assistance
 - Community fridge
 - Referrals for resources (dental, vet, counseling...)

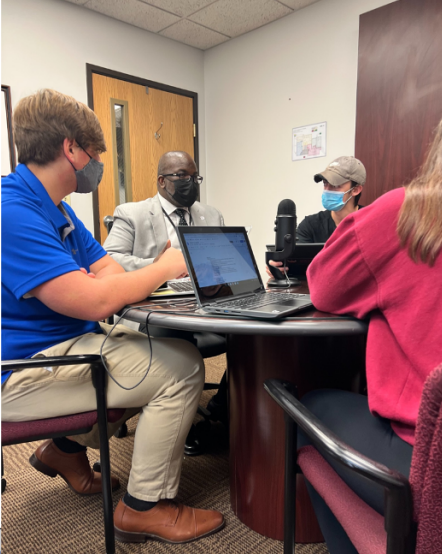
Then, we began looking at locations in Ankeny that we could possibly tour



Week 8+: Create

After looking at different locations, we visited a space that we thought would be great for the nonprofits to share. We thought it had a good location, lots of space, good storage, and a good price offer. The only thing we

	Component, Assembly, or Sub-Assembly	Function of Component, Assembly, or Sub-Assembly	Potential Failure Mode	Potential Failure Effect	Severity	What caused this function of this component, sub-assembly, or assembly to be lost?	Occurrence
Item #	Which component, assembly, or sub-assembly is experiencing a failure?	What is the purpose of the component, assembly, or sub-assembly related to the overall product performance?	How is the function of the of the component, assembly, or sub-assembly effected by this failure?	What impact does the loss of function have on the end user?			
1	extra space in the box	Has no functions (Space not occupied by anything).	Extra space is limited by certain parts but takes up space and limits shelf space	If not on shelves, people can't see and hold product and aren't likely to purchase it	6	Box was manufactured to fit the longest part and created extra, unused space	8
2	visuals on box	Catch attention of buyers (currently white box with pictures and text on the front and one other side)	If not eye-catching, consumers may overlook the product	If the product doesn't jump out or appeal to its audience, it won't be purchased	6	As a team we noticed that the box is not visually appealing. Its just plain and white on the sides on the box.	6
3	size of box	Box isn't visually appealing also has extra unwanted space	Size can alter shelf space	Less product on shelves means less product available to be sold	5	Box is made to fit the parts in the simplest organization	8
4	closing box	Box is taped shut preventing it from reclosure making users possibly unhappy	Frustration with packaging could result in consumer no longer purchasing kreg products	Consumers can't close the box again which could cause frustration	4	When the box was opened, it was close to impossible to close it again without forcefully closing the box, and damaging it.	4
5	small parts plastic and packaging	Material to protect parts (lots of extra plastic that isn't being used)	Taking up space that can be reduced from size of package	Taking up extra shelf space would mean less product available to customers	5	Small parts have designated spot, so were put in another box so they weren't just thrown in	4



DEFINITION OF COLLEGE + CAREER READINESS



Developed in spring 2015 in collaboration between ACSD College & Career Readiness Task Force and the Ankeny Economic Workforce Development Committee:

College and Career Readiness is the state of being fully prepared for a lifetime of personal success beyond high school, regardless of pathway after high school graduation. College and Career Ready students demonstrate critical thinking, complex communication, creativity, collaboration, flexibility and adaptability, and productivity and accountability, as defined by the [Universal Constructs](#). Additionally, students are self-directed and demonstrate grit, the desire to persevere despite the obstacles that may stand in their way.

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RECOGNITION



Governor's STEM Best Award

Public/Private Partnership
Award by Ankeny Economic
Development Corporation

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WHY ORBIS?

Our purpose:

- Unleash passion. Realize potential. Impact the world.

Our niche:

- Equip the next generation of creative problem-solvers.

What makes Orbis unique:

- Co-design your learning.
- Engage in authentic project work with the workforce.
- Collaborate with the workforce and peers from multiple high schools.
- Be empowered as a young professional.

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Orbis Project-Based Experience includes:

- Design Thinking
- Agile project management
- Leadership development

All students in Orbis have common experiences, and yet each student has an individualized experience in which they help co-design.

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COMMUNITY INVOLVEMENT



- Project Provider
- Workforce Expert and Workshop Trainings
- Project Coach
- Host tours
- Provide meeting space
- Internship opportunities
- Mock Interviews
-



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THE "BIG 3"



Leadership, Problem-Solving, and Collaboration

These are essential skills across career fields.

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PROJECT EXAMPLES



Ankeny Service Center

- How might we make the nonprofits of Ankeny more accessible to those in need of their services?

Kreg Tool

- How might we reduce and optimize XXXXX packaging to make it smaller and help maximize placement in retail (like Lowes, Home Depot, and Menards)?

JagHawk Talk (Podcast for ACSD)

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Project Provider Experience

- I approached Joel in the Spring of 2021 about the potential for project opportunities with their organization
- I was looking for opportunities to grow as a leader, mentor, and coach without having any direct reports
- I submitted 2 project plans hoping that the students would pick 1, both were immediately selected



Project Provider Experience

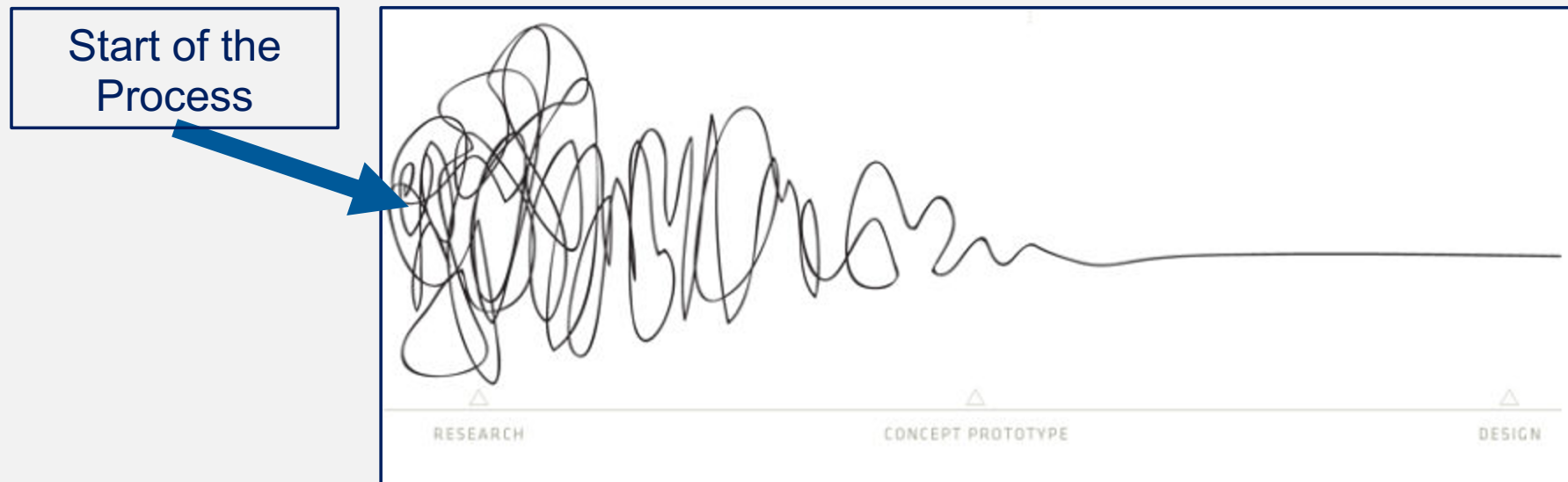
- I focused on breaking up the problem into 1-2 week sprints with the idea that I could teach them the skills they needed along the way
- My end goal was to have the students present to a group of leaders at Kreg, they knocked this one out of the park

Week	Event	Input	Output	Duration	Location
10/18 - 10/22	Kick-Off Meeting/ Competitor Analysis	Project Charter	Competitor Analysis	30 min	Kreg Campus
10/25 - 10/29	Ideation Training+ Student Q&A	Ideation Training		30 min	Virtual
11/1 - 11/5	Kick-Off Ideation + Review Competitor Analysis	Competitor Analysis	Concept Dashboard	30 min	Kreg Campus
11/8 - 11/12	Manufacturing Process Training + Student Q&A	Manufacturing Training		30 min	Kreg Campus
11/15 - 11/19	DFMEA Training/Kick Off+ Student Q&A	DFMEA Training	DFMEAs for Each Concept	30 min	Virtual
11/22 - 11/26	***Thanksgiving Holiday***				
11/29 - 12/3	Review Concept Dashboard	Concept Dashboard		30 min	Kreg Campus
12/6 - 12/10	Review DFMEAs + Report Out Prep	DFMEAs for Each Concept	Report Out Presentation	30 min	Kreg Campus
12/13 - 12/17	Fun Activity @ Kreg (Tour + Workshop?)			60 min	Kreg Campus
12/20 - 12/24 12/27 - 12/31	***Christmas Holiday***				
1/3 - 1/7	Project Report Out to Kreg Team	Report Out Presentation		30 min	Kreg Campus
1/10 - 1/14	***Extra Week If Needed***				



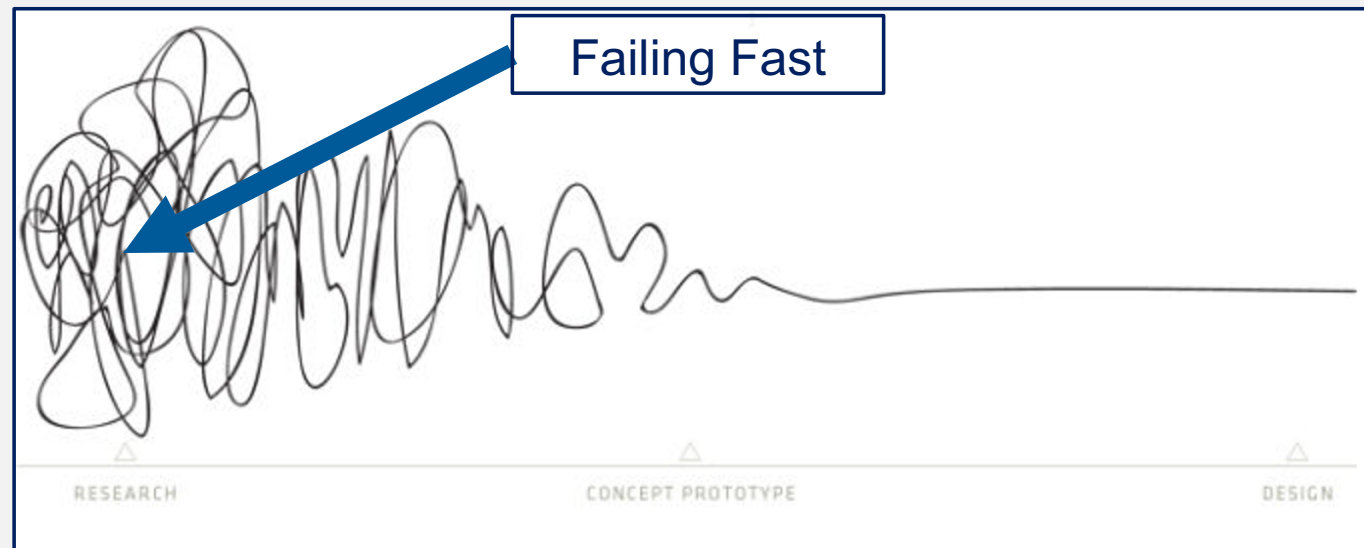
Benefits to Kreg

- As a part of the product development process, we are always looking to try new things and learn from those experiences
- When we set out to solve a problem our goal is always to innovate but rarely does this occur on the first try



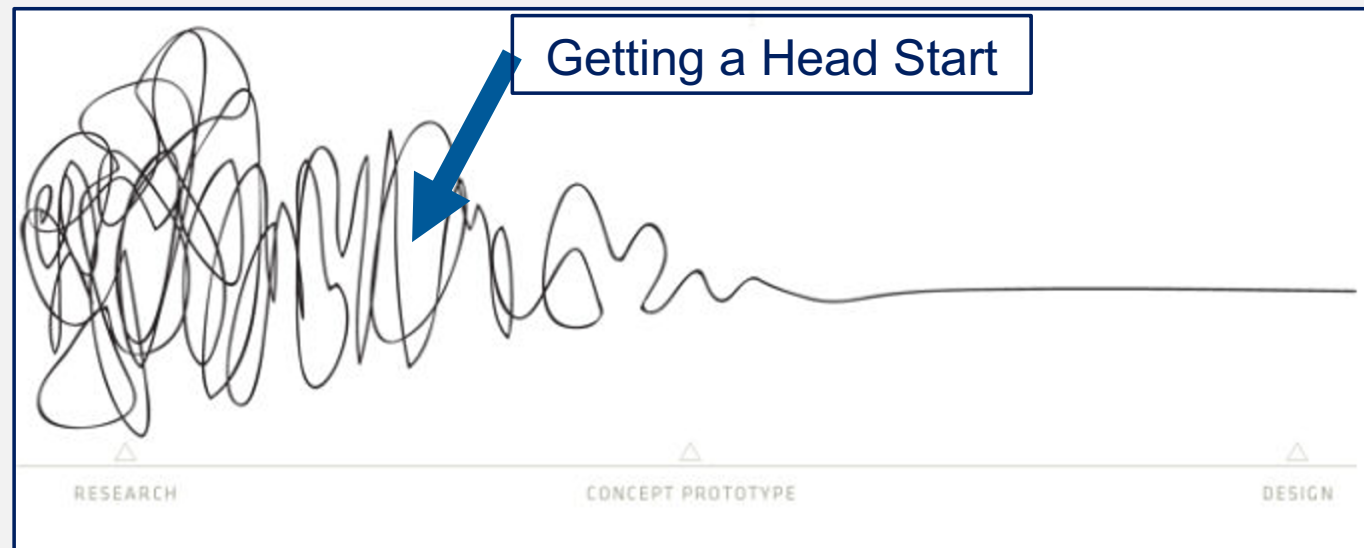
Benefits to Kreg

- At Kreg, the term fail fast is used a lot because with every failure there is something to be learned and the faster you learn, the quicker you end up with your solution
- When we initially approached Orbis with project opportunities the number 1 benefit to us was time



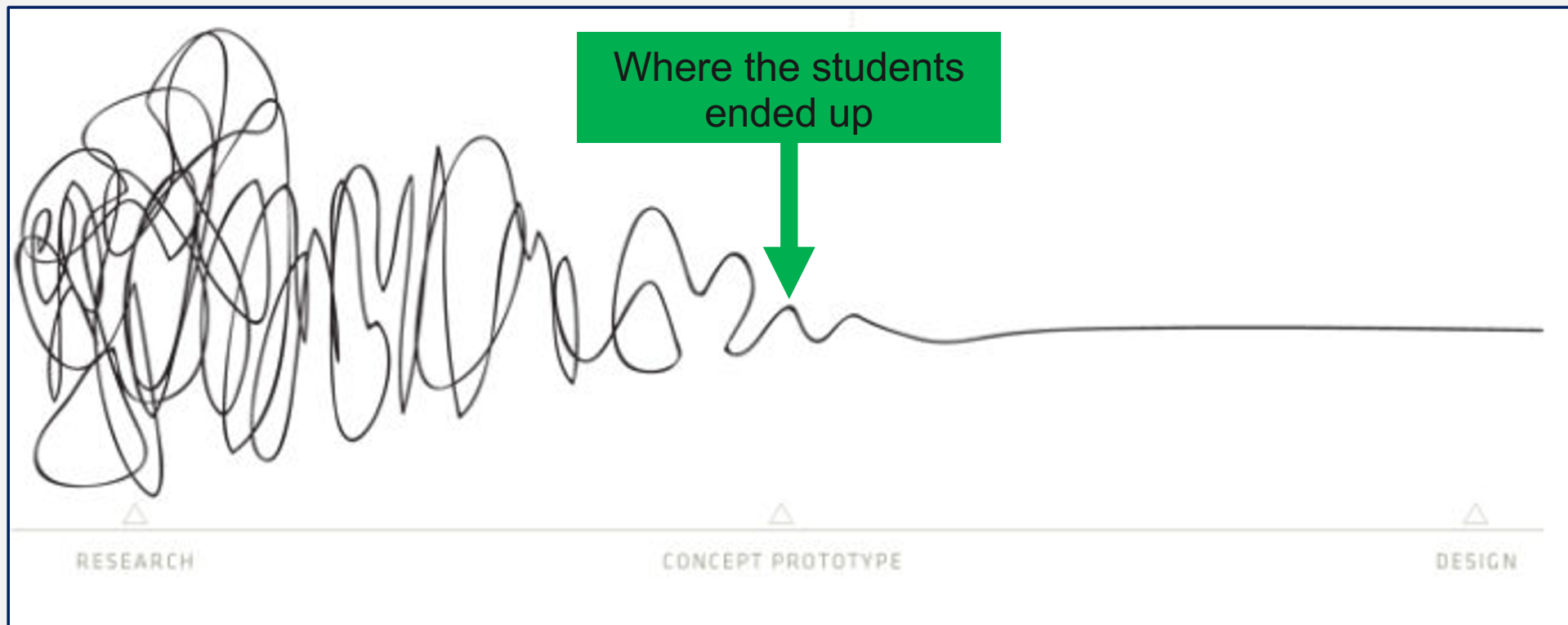
Benefits to Kreg

- Every concept and every iteration that the students completed is something learned on the product and puts us 1 step ahead in our process
- Each step that the Orbis students take brings us closer to solving a problem before we even devote resources to it at Kreg
- From this perspective alone, our experience with Orbis was a success...



Benefits to Kreg

... But expectations don't always match reality and where we ended up was further along the process than we ever could have expected.



Reactions from Kreg Leaders

I couldn't be prouder of the work that the Orbis team did. I very much support the vision of Orbis and look forward (as KREG) to supporting them in anyway we can. These types of partnerships not only give the student a great head start in figuring out what interests they should pursue but it equally motivates the sponsors while reinforcing the growth mindset value we hold dear here at KREG.

– Sam Titus (VP of Operations at Kreg)



Reactions from Kreg Leaders

I was thoroughly impressed at the poise the teams had while presenting to the audience at Kreg Tool. If I were in their shoes at that age, that would be the most terrifying thing for me. It is obvious that their mentors and this project set them up for success in both presenting to an audience, as well as producing a great end product. I commend the students on their courage and professionalism throughout this project and presentation.

– Elliot Hoff (Lead Product Development Engineer)



INNOVATOR IMPACT



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Orbis Website: www.ankenyschools.org/orbis

Twitter: @ACSDOrbis

Facebook: www.Facebook.com/AnkenyOrbis

Dr. Jill Urich, Co-Director of Orbis, Principal of Centennial High School
jill.urich@ankenyschools.org

Pete Apple, Co-Director of Orbis, Principal of Ankeny High School
peter.apple@ankenyschools.org

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Amber Fairbanks

Biology and Human Anatomy and Physiology Teacher at
Waukee Northwest High School //
2021 Iowa STEM Teacher Extern at Iowa PBS

Rachel Miller

8th Grade Science Teacher at Bondurant-Farrar Middle
School // 2020 Iowa STEM Teacher Extern at Accumold

A stylized, colorful illustration of a landscape. The foreground features rolling green hills with a dark brown path. On the left, there is a green tree, a purple flower, and some orange foliage. A small red bird is flying in the sky. The background consists of layered blue and white hills under a blue sky.

Accumold Experience 2020

COVID-19 edition—#Millertime

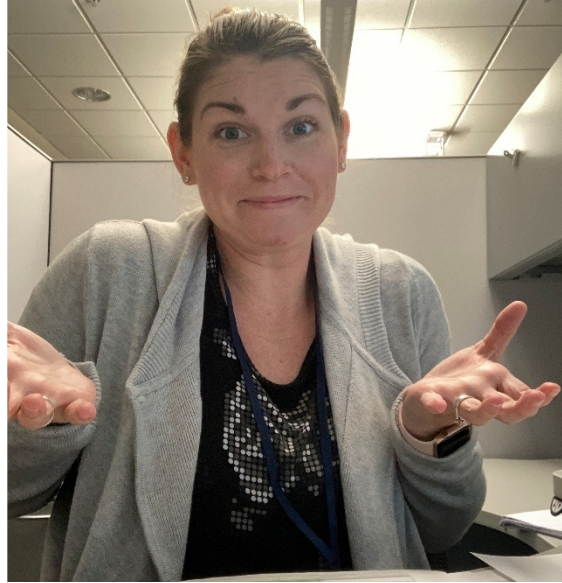
Summary

- *Sustainability report*
- *TRUE Zero Waste Certification*
- *QE training*

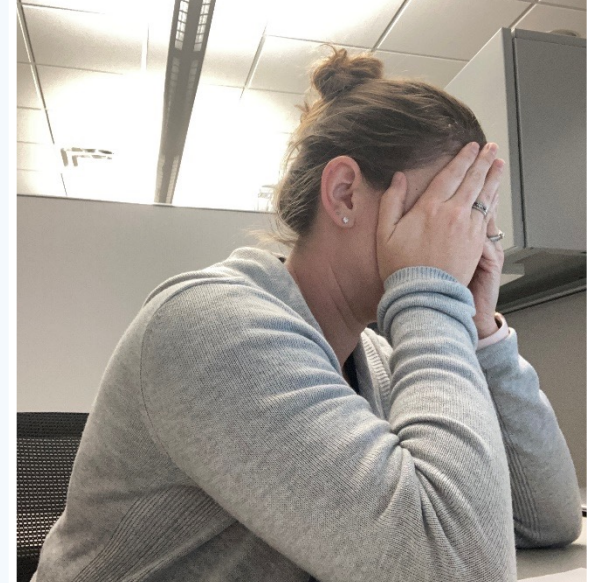
First week- What is sustainability reporting?



Excited with my mask on.



David Cooper is in an audit here is 116 page document to read



What did I get myself into?



Sustainability reporting

I can do it!

EPA have great resources.

Meeting

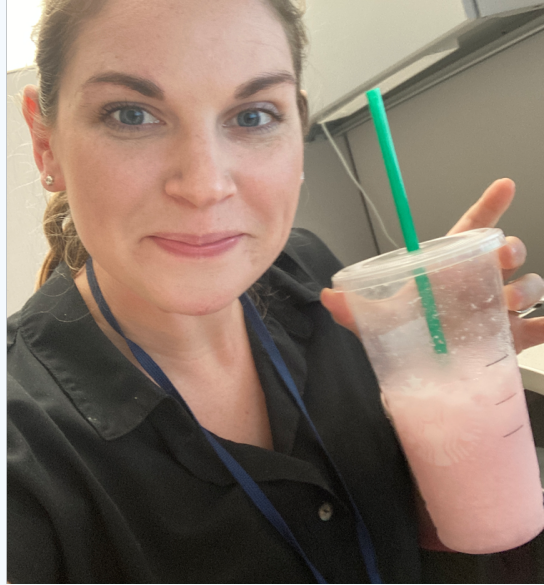
JK-we can't do that

I found a new way

Building the Sustainability Report



*Learning about
Accumold's history.*



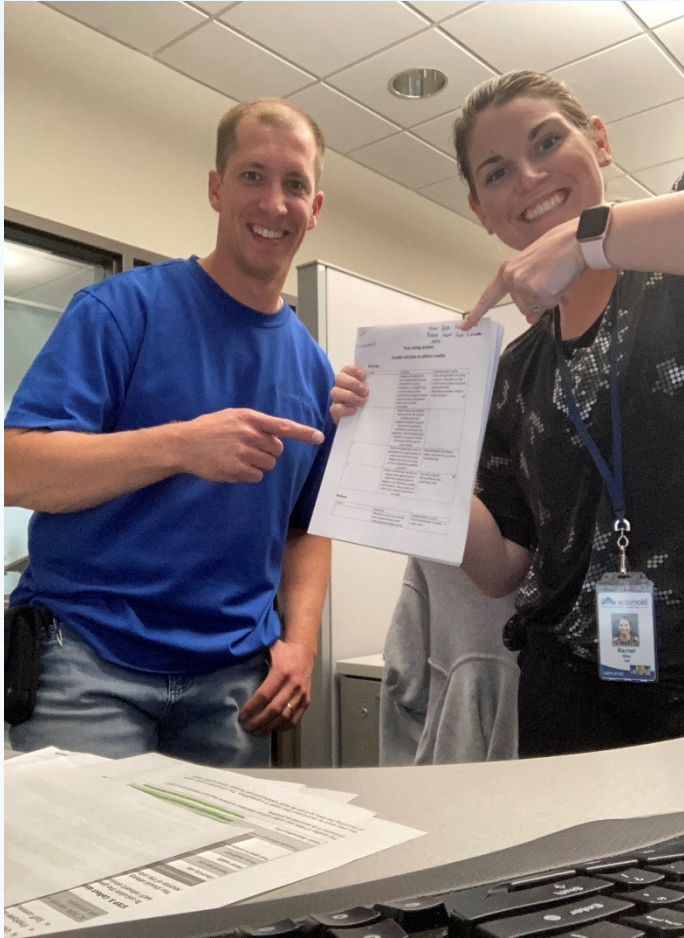
*Putting the report
together.*



Layout was sent out.

Sustainability Report

- Sustainability Report



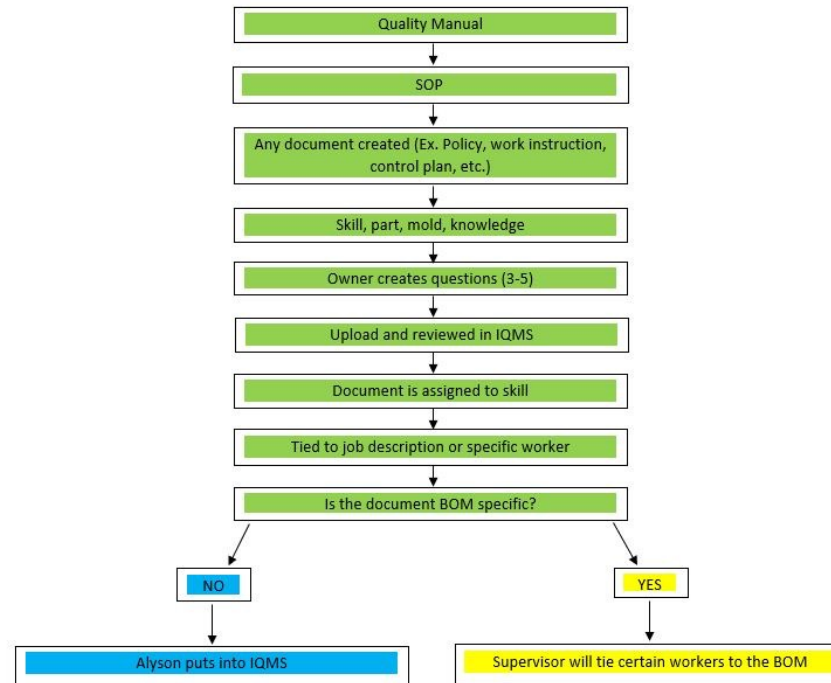
TRUE Zero Waste Certification

Worked with Matt on reviewing and producing implementation steps for Accumold to take to become TRUE certified.

Shared these ideas with the Environmental team.

IQMS Certification Training

IQMS Flow Chart



Quality Engineer Training



Overview on creating questions and giving QE's templates.



1:1 with each QE-Readability tool, reducing complexity in writing, IQMS

Summary of findings

Skills I learned along the way

- True feeling of researching
- How to write a sustainability report
- Aaron showed me all the ways of formatting
- Excel spreadsheets
- Readability tool
- Sustainability isn't just about environment
- Kaizen
- Built confidence

People and Experience



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Advancements on Strategic Planning

Diversity, Equity and Inclusion Implementation

Co-Chairs Stephanie Laird and Sara Nelson

Diversity, Equity, and Inclusion in STEM



Charge to the Working Group

Timeline:

January 2020 - Council priority shared

2020 - DEI Committee works on recommendations

January 2021 - Presented to STEM Council

August 2021 - Began work on implementation

Develop recommended actions for the Governor's STEM Advisory Council to promote equity in STEM, especially increasing diversity of youth in current STEM programs and in the workforce.

Council Recommended Action:

Prioritize DEI focus in STEM communications and professional learning opportunities

1. Communicate the STEM Council's DEI focus on all materials and platforms.
 - ✓ STEM Council podcasts on DEI topics
 - ✓ Inclusion of diverse role models in communications

1. Increase DEI in STEM professional learning opportunities.
 - ✓ Educator workshop with Dr. Aris Winger
 - 🕒 In development

Council Recommended Action:

Increase diverse youth voice in STEM programming and outreach

1. Expand diverse youth participation
 - 🕒 Youth on STEM Council and STEM Advisory Boards
2. Champion and celebrate diverse youth in STEM
 - 🕒 Seeking business partner(s) to start a youth STEM award
3. Creation and administration of Iowa Youth Voice Survey
 - ✓ STEM Survey (n=750)
 - Thank you to iJAG, IVRS, and Dubuque Community School District for survey data.*

Council Recommended Action:

Increase diverse role models in STEM programming and outreach

1. Increase diverse role models in all STEM Council outreach
✓ Implementing
2. Broaden Scale-up and STEM Best program requirements for inclusion of diverse students
✓ Expanded on Scale-Up rubrics
3. Establish a formal partnership between Iowa STEM and key diverse Iowa STEM professional organizations
🕒 Continuing to expand this networking area

Survey Process - Data Story

1. DEI Working Group creates survey questions, questions reviewed by data partner, translated to Spanish also
2. DEI group identifies pilot student groups
 - a. iJag (Iowa Jobs for America's Graduates)
 - b. Dubuque Community School District
 - c. Iowa Vocational Rehabilitation Services
3. Survey administered anonymously on Google Forms
4. Data collected and analyzed
 - a. Opened ended questions coded, themes recognized
5. Share out data and data analysis with Council

What would be the best way to get your attention and make you want to check out STEM courses and activities?

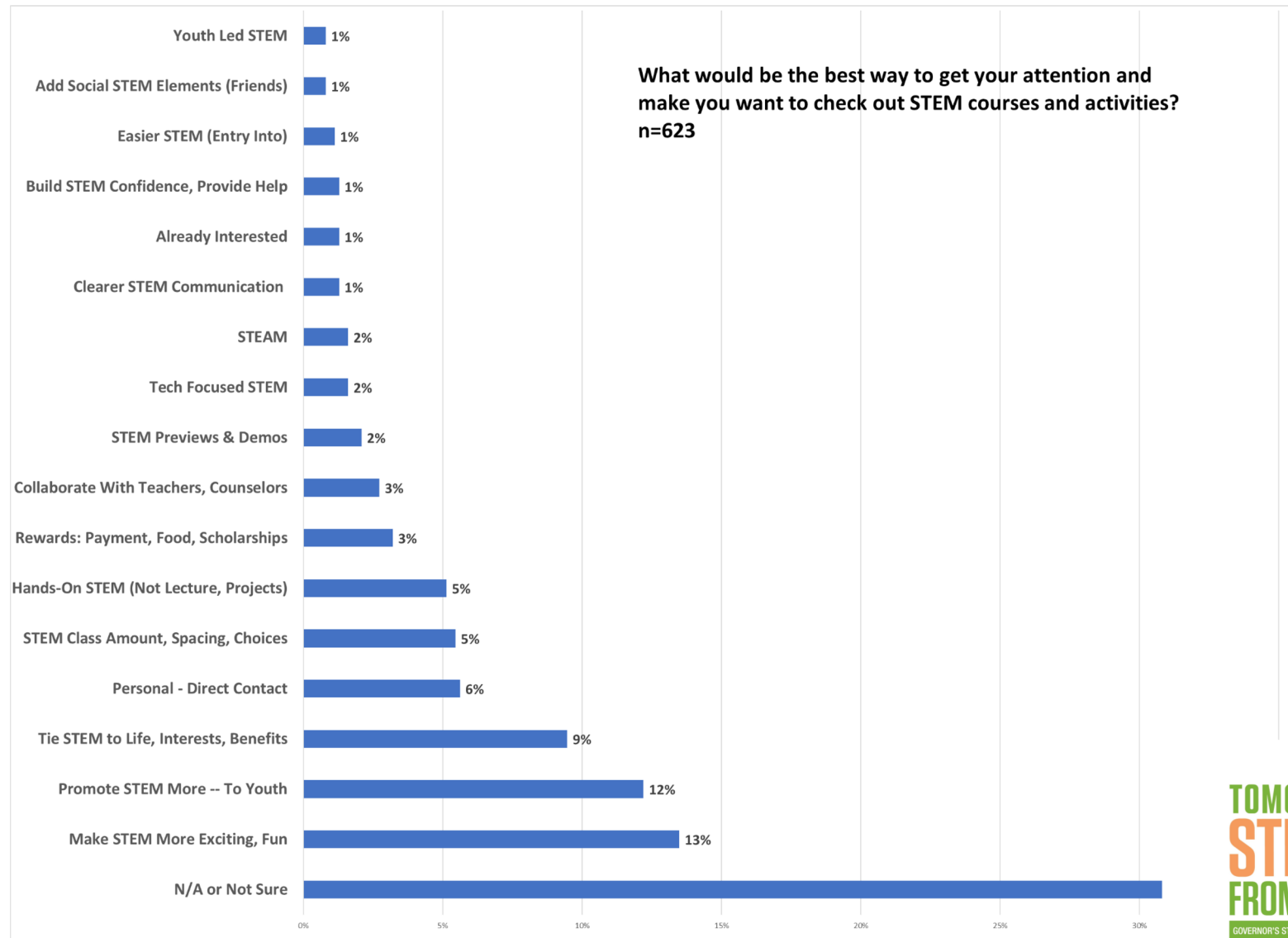
“I wouldn’t no matter what, I’ve heard girls are treated badly in STEM plus I’m bad at those things.”

“By providing interesting and creative activities that not only I but also the whole school as well to participant in.”

“Make it sound fun when i think of stem it sounds like straight work.”

Included for fun – “The intercom.”

Students speak: Strategies to capture youth attention for STEM



Themes from the STEM Youth Survey

Include teachers, counselors, and administrators

Hands-on & minds-on STEM

Create WOW factor STEM experiences

Tie STEM to youth lives/communities

Provide direct and personal contact

Promote more in school and on youth social media platforms

Accessibility, ease of access points

Proposed Next Steps

1. Continue to seek and include diverse youth voice
 - a. Add diverse youth members to STEM Council and Hubs
 - b. Repeat youth voice survey annually, use data to inform
 - c. PD around including youth voice

1. Create WOW factor STEM, in partnership with youth/business
 - a. Build kits for STEM Ambassador to deliver
 - b. Stress how if you like this .. then consider this, create pathways

1. Increase direct contact/visits with diverse STEM role models across all grade levels
 - a. Create/expand a STEM Role Model/Speaker database

1. Pilot youth STEM award for 2022-2023 school year
 - a. 1-3 awards per STEM Hub

Questions?

*Thank you to the DEI committee members for your work.
We look forward to feedback from the STEM Council.*

Stephanie Laird & Sara Nelson, co-chairs

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Advancements
on Strategic
Planning

Creativity and Innovation Task Force Implementation

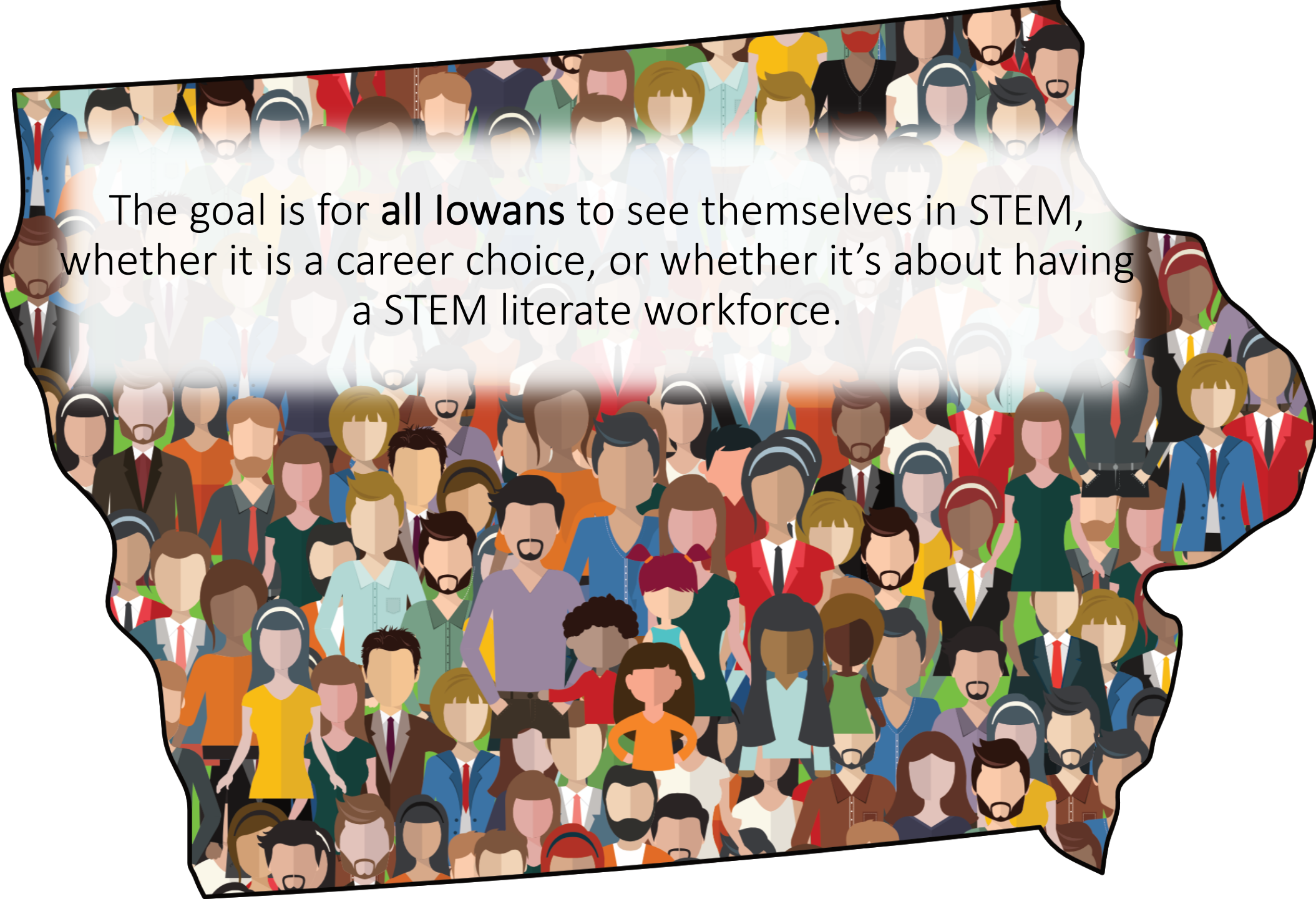
Co-Chairs Chris Kramer and Yen Verhoeven

Creativity and Innovation Task Force

under the STEM Advisory Council

A new onramp to STEM





The goal is for **all lowans** to see themselves in STEM,
whether it is a career choice, or whether it's about having
a STEM literate workforce.



Image: Back to the Future



Misconceptions about STEM

When teachers have a fear of math, their pupils can absorb the wrong lesson

Helping educators grow more comfortable with math supports students, too



- Intimidation
 - Affects student choices to go into STEM
- Limited instructional time



Transdisciplinary STEM.

Transdisciplinary

“Includes fully merged disciplines without boundaries and lessons **rooted in authentic problems or inquiry.**”

(p. 34, Perignat & Katz-Buonincontro, 2019).

- Bybee, R.W. (2013). *The Case for STEM Education: Challenges and Opportunities*. NSTA Press.
- Martinez, J.E. (2017). The search for method in STEAM education. In *Play, Performance, Learning, and Development* (pp.13-33)
- Perignat, E., Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative review. *Thinking Skills and Creativity*, 31. 31-43.
- Weld, J. (2017). *Creating a STEM Culture for Teaching and Learning*. NSTA Press



Transdisciplinary

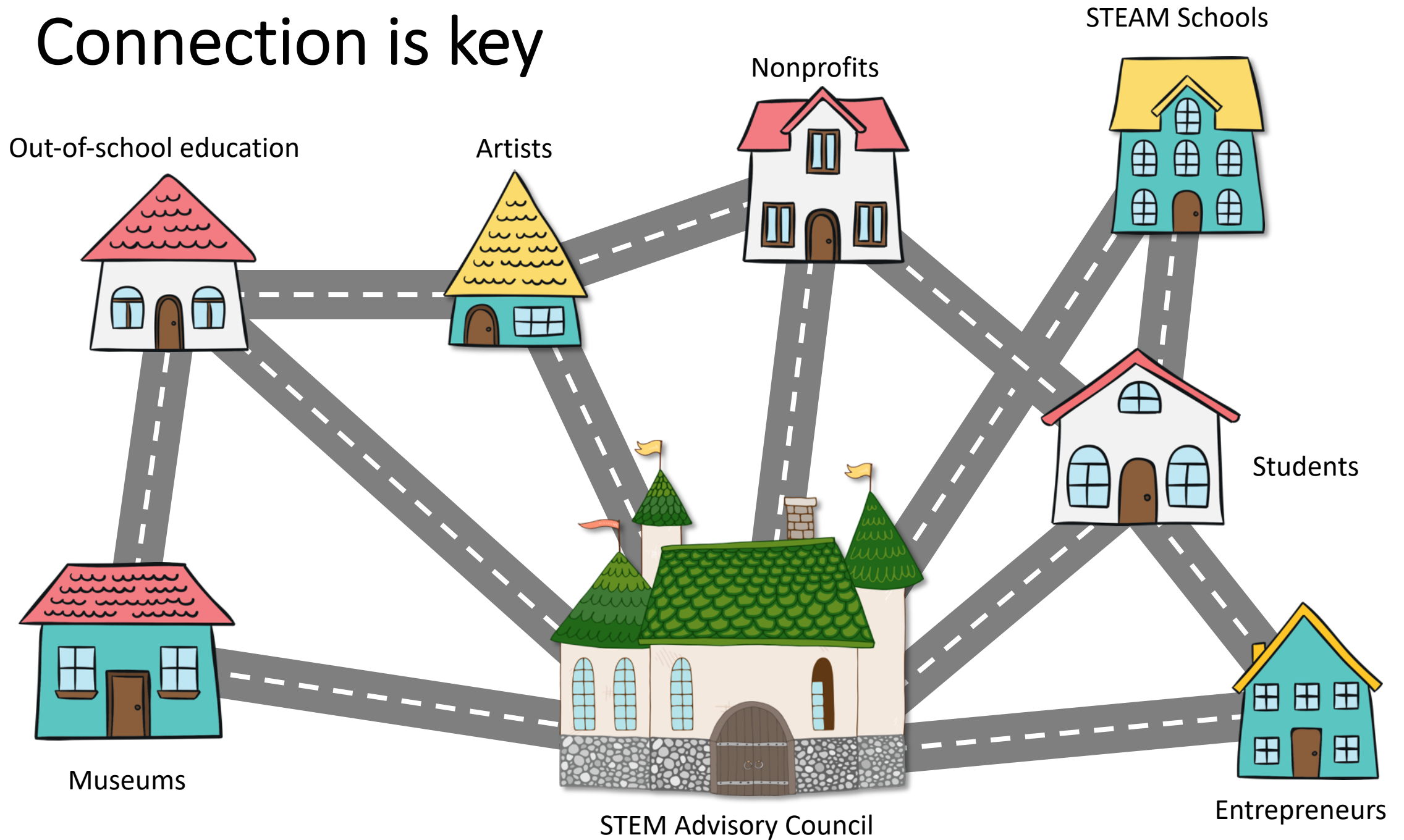


Gewertz, C. (2007, June 12). Soft skills in big demand: Interest in teaching students habits of mind for success in life is on the rise. *Education Week*, 26(40), 25-27.

Iowa Department of Education. (n.d.) Iowa Core K-12 21st Century Skills. Retrieved from: <https://iowacore.gov/standards/21st-century-skills/k-1-2-3-4-5-6-7-8-9-10-11-12/21st-century-skills>



Connection is key





**Business
&
Industry**

**Business &
Entrepreneurship**
Corporate, small business,
manufacturing

Out-of-School Educators
Museums
4H
Extensions
Libraries

**General
Public**

Students

Formal Education
K-12 teachers
Higher ed
AEA

State of Iowa
Governor's STEM Advisory Council
IA Department of Cultural Affairs
Department of Education
Future Ready Iowa

**Statewide
Initiatives**

Members of the Creativity and Innovation Task Force

Chris Kramer	Director	Iowa Department of Cultural Affairs
Brad Niebling, PhD	Chief, Bureau of Learner Strategies and Supports	Iowa Department of Education
David Schmitz	Administrator	IDCA/Iowa Arts Council
Yen Verhoeven	CEO, Founder	Qi Learning Research Group
Peter Hong	Director	ISU Startup Factory
Brian Waller	President	The Technology Association of Iowa
Cindy Dietz	Associate Director, State Government Relations	Raython Technologies
Rosalind Fox	Factory Manager	John Deere Des Moines Works
John Teeple	Chief Operating Officer	Sukup Manufacturing
Angela Williams Jackson	Senior Vice President, Diversity, Equity and Inclusion	Athene
Kacia Cain	Science Educator	Winterset HS/DMACC
Sarah Jones	Elementary Arts Educator	Johnson STEAM Academy
Carrie Taylor	K-12 ELP Gifted STEAM Educator	Highland Elementary, Waterloo School District
Jennifer Wallace	Social Studies and Humanities Educator, Jr/Sr High	Regina Catholic Education Center
Barb Schwamman	Superintendent	Osage Community School District
Leon Kuehner	Executive Director	Iowa Alliance for Arts Education
Chris Johnson	President	Vesterheim The National Norwegian-American Museum & Folk Art School
Rachael Mullins	President and CEO	Putnam Museum
Carrie Lebowich	Executive Director	LaunchPAD Children's Museum
Jeff Capps	Executive Director	Iowa Children's Museum
Dawn Morgan	Program Coordinator	Chariton Community Library/ISU Extension
Claudia Rivera	Executive Director	La Luz Centro Cultural

Goal 1: Serve as a connector of formal and informal learning initiatives statewide.

- Connect resources, institutions, partners, and others who may be outside of “traditional STEM” in ways that can enhance and strengthen transdisciplinary education.
- Connect existing STEAM and STEM schools, makerspaces/ learning labs and STEAM programs in Iowa.
- Incorporate and integrate STEM and STEAM in our informal learning spaces, with a focus on underserved and rural places.
- Ensure Creativity & Innovation Task Force representation in all six STEM regions to make sure that a transdisciplinary mindset is reflected in programming.

Task Force Goals

Goal 1: Serve as a connector of formal and out-of-classroom learning initiatives statewide.

Goal 2: Develop innovative, Iowa-based solutions to further the work and mission of the STEM Council

Goal 3: Support educators and encourage high-quality transdisciplinary instruction.

Goal 4: Increase funding pathways

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GOVERNOR'S STEM ADVISORY COUNCIL

Advancements on Strategic Planning

Career Guidance Implementation

Co-Chairs Wendy Batchelder and Rob Denson

Career Exploration and Guidance Working Group

Co-Chairs: Rob Densen, DMACC

Wendy Batchelder, Salesforce

Members: Julie Adair, Iowa Healthcare Association
 Kelly Bergman, Iowa State University
 Jane Bradley, Iowa Department of Education
 Mary Jane Cobb, Iowa State Education Association
 Robert Cramer, Cramer and Associates, Inc.
 Aimee Hospodarsky, Monticello Community School District
 Jason Huffman, Huffman Welding
 Kathryn Kunert, MidAmerican Energy Company
 Kathy Leggett, Iowa Workforce Development
 David Mitchell, Iowa Vocational Rehabilitation Services
 Allie Mouw, Northwest Iowa Community College
 Bob Reid, Iowa Jobs for America's Graduates (iJAG)
 Kelsey Tyrrell, World Food Prize Foundation
 Georgia Van Gundy, Hy-Vee
 Teri Vos, Central College
 Mark Wiederspan, Iowa College Aid
 Dave Williams, State of Iowa Representatives
 Emily Wilkerson, Iowa State University

Implementation Team

Mary Jackson	Iowa Voc. Rehab
Joe Murphy	IBC
Linda Fandel	Dept Educ
Carrie Rankin	STEM
Mike Ralston	ABI
Phil Jeneary	IASB
Roark Horn	School Admin of Iowa
Emily Shields	Community College Trustees
Jill Lippincott	IEDA
Jeremy Varner	DE
David Ford	AEA Mississippi Bend
Beth Townsend	IWD
Jordan Menning	STEM NW
Laura Williams	AEA Great Plains
Kelly Bergman	STEM
Corey Rogers	Grant Wood AEA
Rob Denson	DMACC
Wendy Batchelder	Salesforce

Charge of Working Group

Career Exploration and Guidance



Develop recommended actions for the Governor's STEM Advisory Council to support **career exploration** and **guidance**, especially early exposure perhaps involving tactics like internships/work-based learning for younger students as well as teachers/administrators.

Recommendation

Iowa School Counselor Career Guidance Initiative

Enhance existing efforts and support new initiatives through the recommended *Iowa School Counselor Career Guidance Initiative*.

WORK IN PROCESS

Excite

Generate excitement about careers in STEM

Explore

Provide opportunities for students

Connect students with STEM professionals

Gain experience for students

GREATNESS
STEMS
FROM IOWANS



IOWA
Department of Education

College & Career transition Counselors



GREATNESS
STEMS
FROM IOWANS

Statewide initiative: College and Career Transition
Counselor

Lead Organizations

**AEA PREP (Postsecondary
Readiness & Equity
Partnership)**

729 21st Street
Bettendorf, IA 52722
Phone: 563-359-1371
www.iowaaea.org/aea-prep

Iowa College Aid

475 SW Fifth St., Suite D
Des Moines, IA 50309
Phone: 515-725.3400
www.iowacollegeaid.gov

Iowa Department of Education

400 E. 14th Street
Des Moines, IA 50319-0146
Phone: 515-281-8260
www.educateiowa.gov



A \$2,000,000 earmark is working its way through Congress for additional CCTC's

A grant for 10 additional CCCTS is expected next week for

A grant for 10 additional CCCTS is expected next week for

A grant for 10 additional CCCTS is expected next week for

- ◆ NIACC* (2)
- ◆ WITCC* (1)

Recommendations

Iowa School Counselor Career Guidance Initiative

The Working Group developed 11 action items to address the charge of the working group, enhance existing efforts, and support new initiatives.

- A. **Increase occupational awareness at all grade levels (CCTC's working grades 11 & 12)**
- B. **Develop grade specific materials for educators**
- C. **Enable school faculty to connect to future STEM careers**
- D. **Formalize and increase connection of area businesses to schools (CCTC's working grades 11 & 12)**
- E. **Enable schools to engage in Professional Staff Sharing Agreements to work with many more students and businesses**
- F. **Leverage student Individual Career and Academic Plan to determine specific STEM skills needed to engage in their projected occupation (CCTC's working grades 11 & 12)**
- G. **Facilitate connections between K-12 students and higher education representatives (CCTC's working grades 11 & 12)**
- H. **Extend new and specific counselor credential and certification through IDE**
- I. **Infuse career-related assessments into K-12 schools to enable School Counselors**
- J. **Ensure every district has a plan coordinating pre-employment transition services for students with disabilities**
- K. **Continue to build upon existing classes at high school level to provide more opportunities for direct hands-on learning**

Work-Based Learning Recommendations

ECONOMIC RECOVERY ADVISORY BOARD

- **Recommendation #1:** Establish a designated work-based learning coordinator in each school district of Iowa
- **Recommendation #2:** Ensure all students have access to a career coach or college-career transition counselor
- **Recommendation #3:** Encourage/promote/(require?) a work-based learning experience of all Iowa K-12 graduates and community college students
- **Recommendation #4:** Require a work-based learning experience of all Iowa licensed K-12 educators
- **Recommendation #5:** Establish an online, free tutorial/certificate for awarding MOC credential for educators across disciplinary areas

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dedicated to building a strong STEM education foundation for all Iowans

Thank You!

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2020-2021 Annual Assessment Report: Key Findings and Trends

Dr. Erin Heiden, Assistant Director, University of Northern
Iowa Center for Social and Behavioral Research

Iowa STEM Monitoring

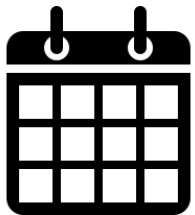
Statewide Survey of Adult Attitudes Toward STEM





Statewide Survey of Public Attitudes Toward STEM

**Dual-frame RDD
sampling design with
advance letter PTW /
No incentive**



Field dates:

June 16 – October 7, 2021



67 landline interviews



687 wireless interviews



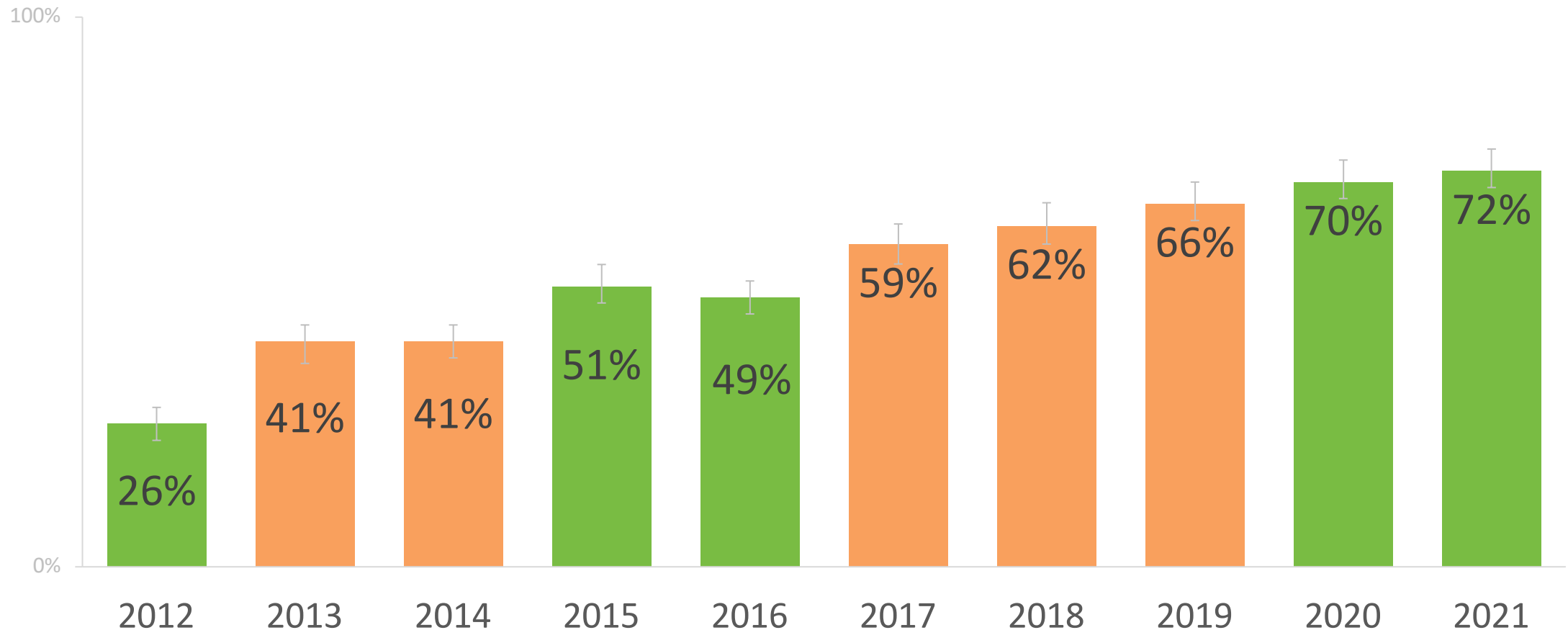
249 web completions

Telephone:
RR3: 30%
COOP3: 82%

Have you read, seen, or heard of STEM?

7 in 10 Iowans (70%) said 'Yes'

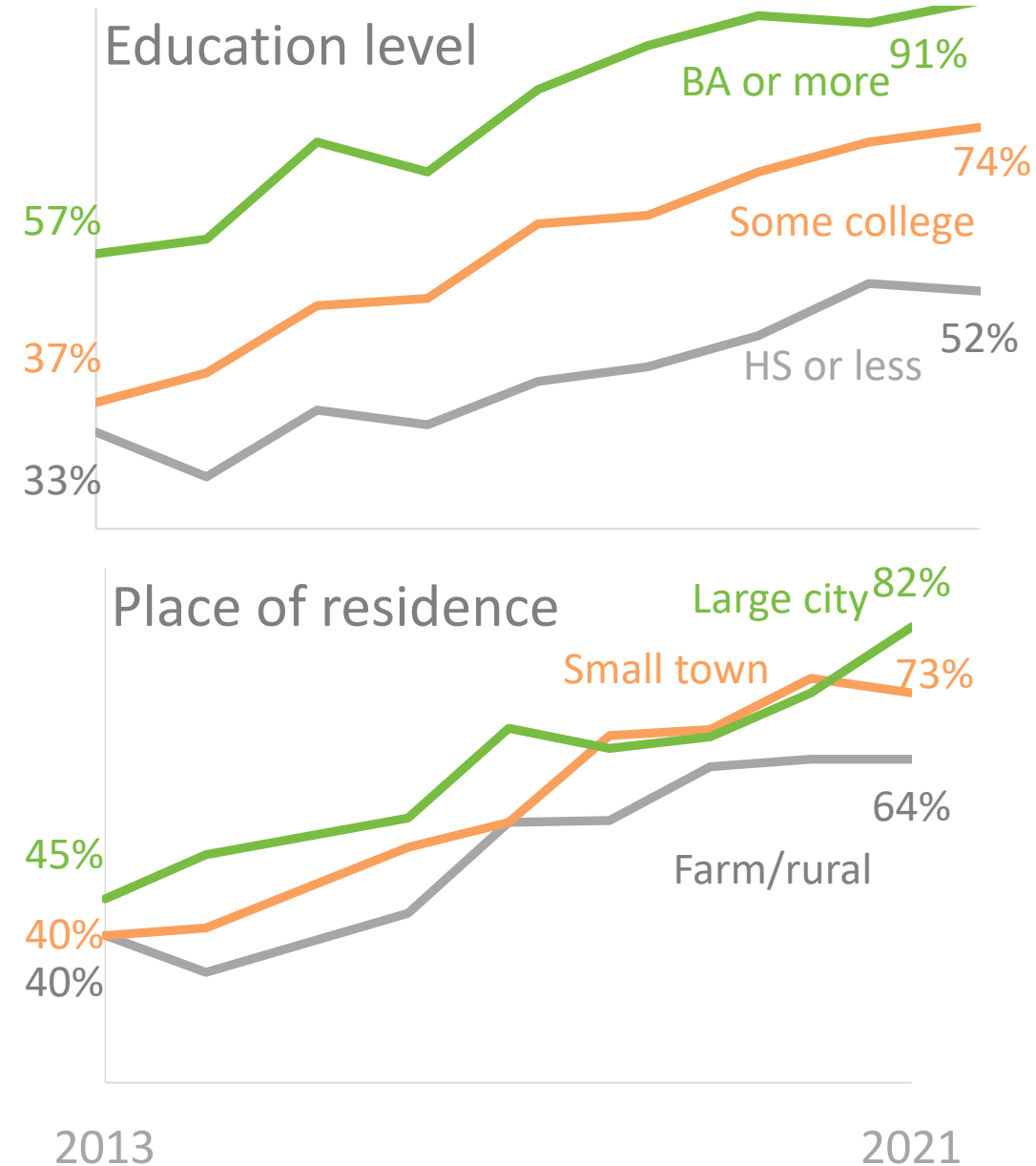
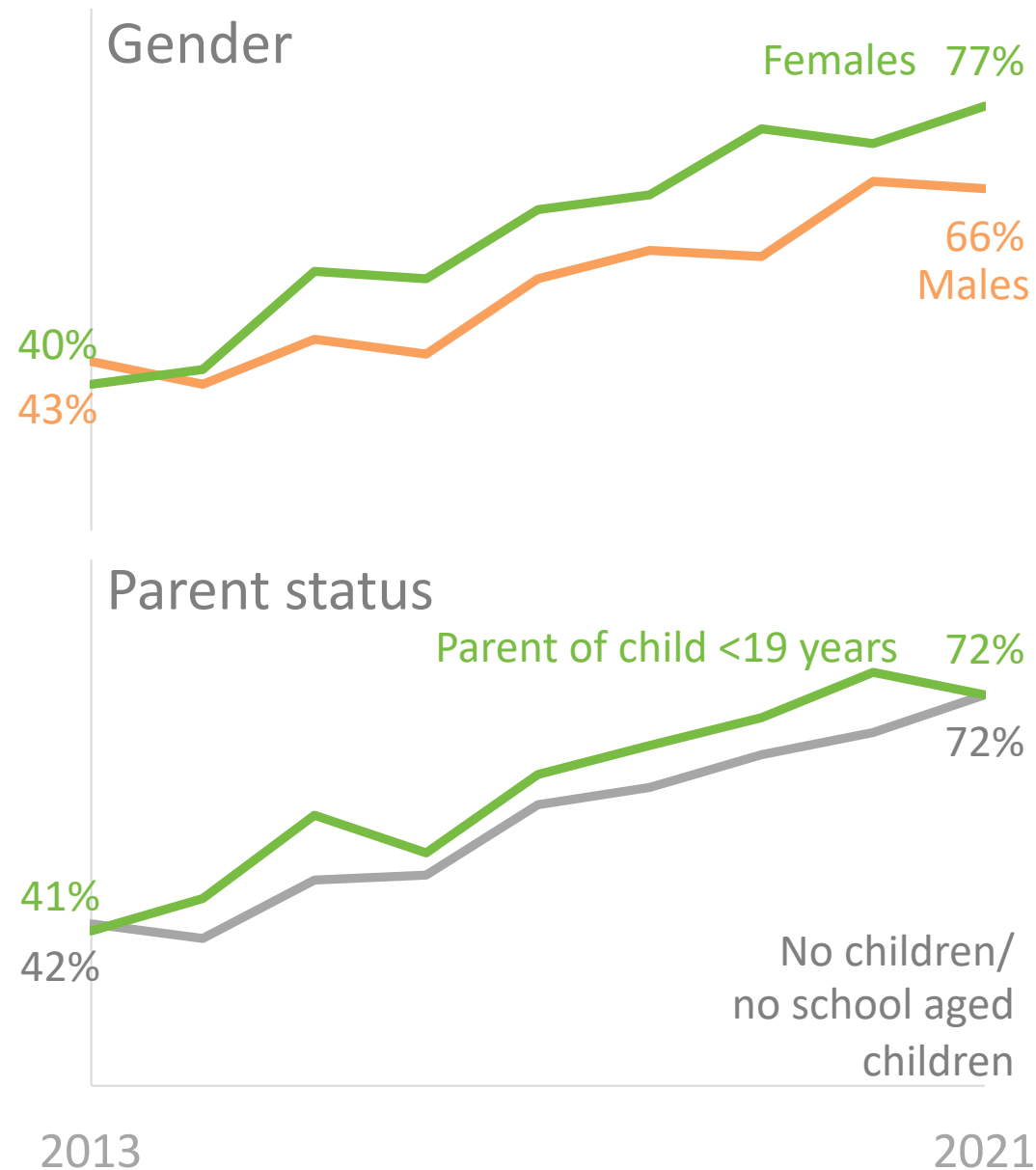
Awareness of STEM continues to increase year-over-year and is significantly higher than measured in 2018 and prior years.



Question: STEM stands for 'science, technology, engineering, and mathematics.' Have you read, seen, or heard of this before? (% Yes)

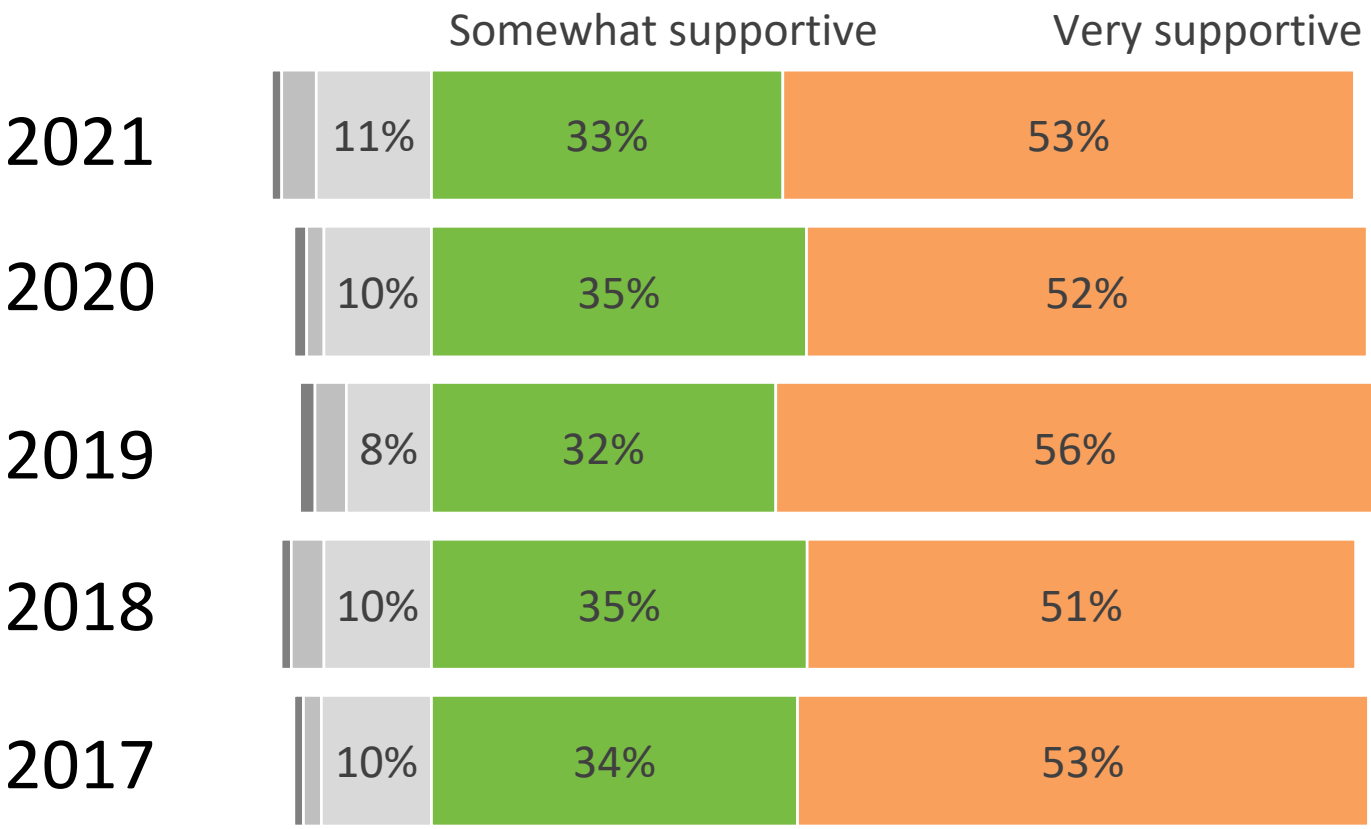
Source: 2012-2021 Statewide Survey of Adult Iowans Toward STEM, Iowa STEM Monitoring Project, January 2022

Awareness of STEM is has increased across all subgroups



Overall support for STEM efforts remains high

A large majority (86%) of lowans support efforts to devote resources and develop initiatives to promote STEM education in Iowa, and over half (53%) said they were *very supportive*.



9 in 10

agree that it is important for area businesses to be involved in STEM partnerships with K-12 schools.

Question: Overall, to what degree do you support or oppose state efforts to devote resources and develop initiatives to promote STEM education in Iowa? Would you say you are... (% Very opposed, Somewhat opposed, Neither, Somewhat supportive, Very supportive)
Question: Please tell me whether you strongly agree, agree, disagree, or strongly disagree with the statement: It is important for area businesses to be involved in STEM partnerships with K-12 schools in my region.
Source: 2021 Statewide Survey of Adult lowans Toward STEM, Iowa STEM Monitoring Project, January 2022

Iowans continue to support prioritizing STEM education

9 in 10 Iowans think STEM education should be a priority in their local school districts, but only 57% say it is a priority and another 15% don't know.

Do you think STEM education
is a priority
in your local school district?

57%

(28% said No, 15% Don't Know)

Do you think STEM education
should be a priority
in your local school district?

95%

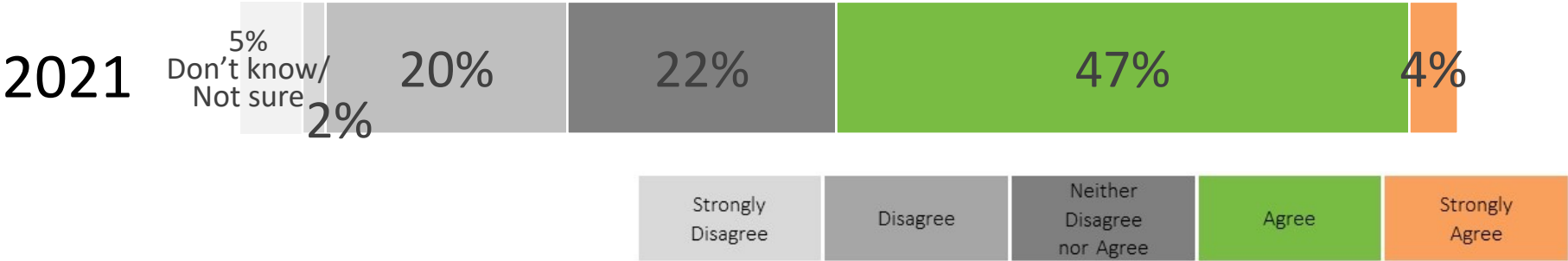
Question: Do you think STEM education is a priority in your local school district? (%Yes/No/Don't know)

Do you think STEM education should be a priority in your local school district? (%Yes/No)

Source: 2021 Statewide Survey of Adult Iowans Toward STEM, Iowa STEM Monitoring Project, January 2022

Iowans view of the quality of STEM education in Iowa

5 in 10 Iowans agree that overall,
the quality of STEM education in Iowa is high.



Question: Please tell me whether you strongly agree, agree, disagree, or strongly disagree with each of the following statements: Overall, the quality of STEM education in Iowa is high.... (% Strongly disagree, Disagree, Neither disagree nor agree, Agree, Strongly agree, Don't know/Not sure)
Source: 2021 Statewide Survey of Adult Iowans Toward STEM, Iowa STEM Monitoring Project, January 2022

Iowa STEM Monitoring Educator Survey

Andrew Guhin, Aaron Vincent, & Justin Szabo

RISE

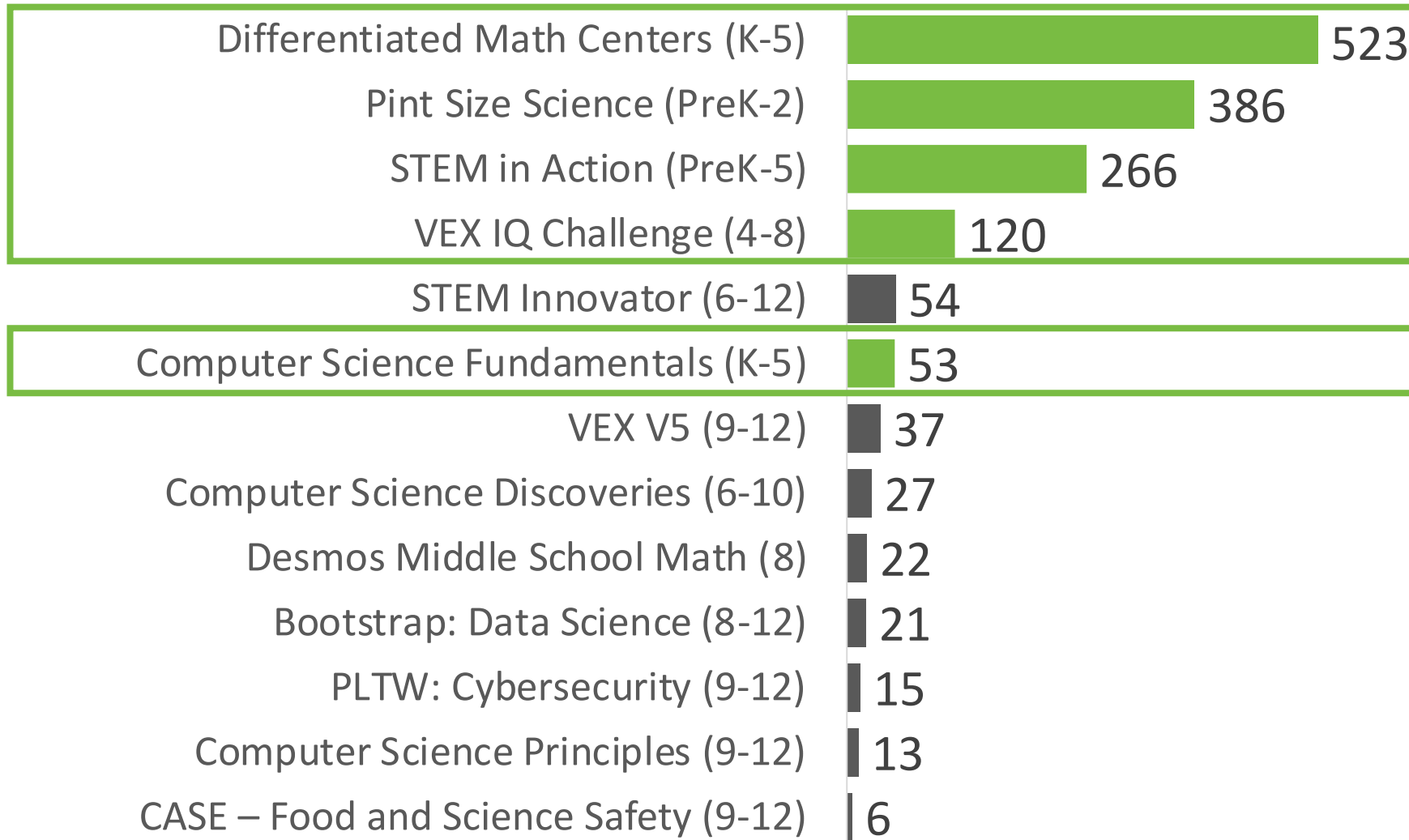
Research Institute for Studies in Education

IOWA STATE UNIVERSITY

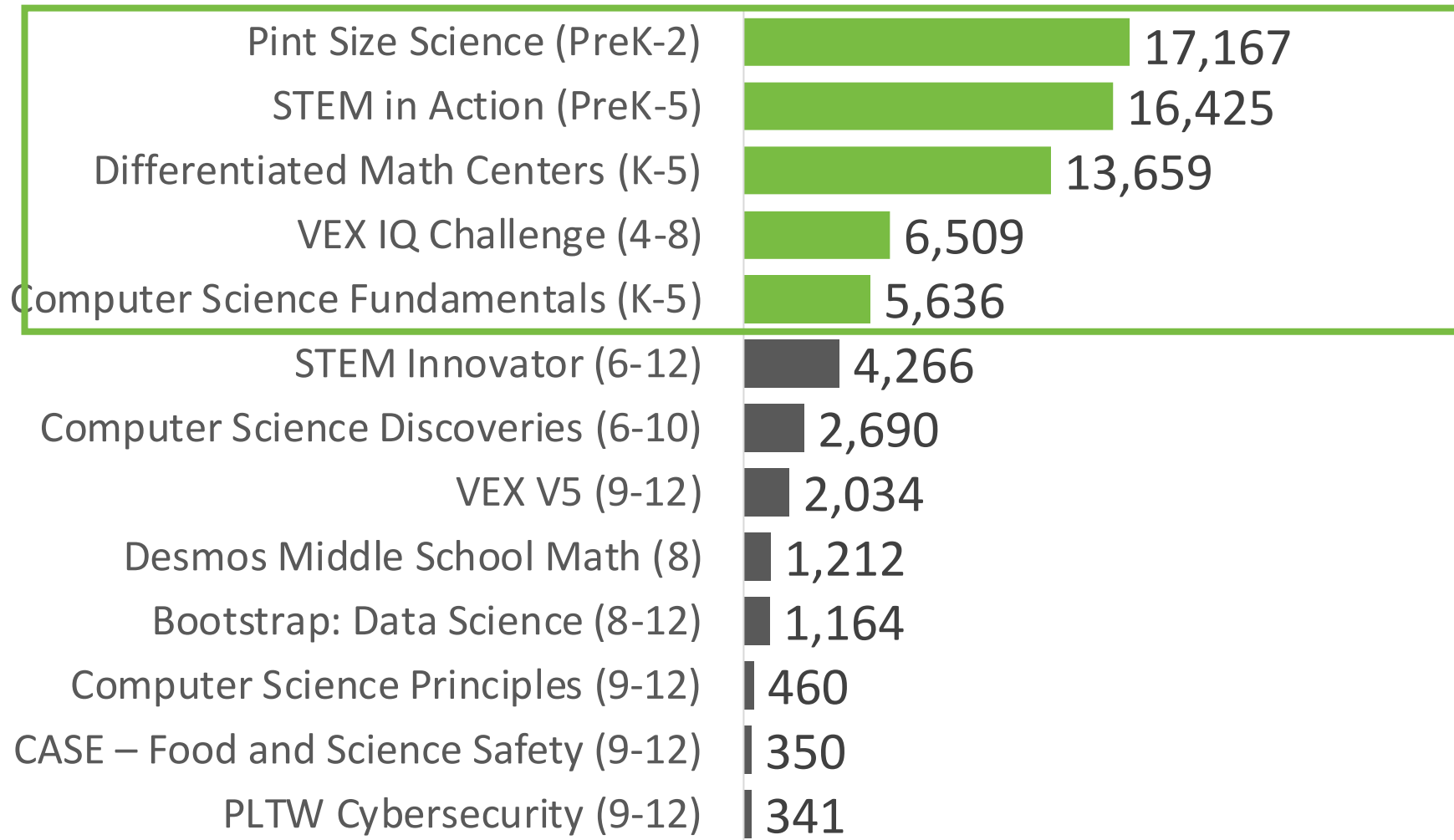


The 2020-2021 STEM Scale-Up Program: 1,543 awards

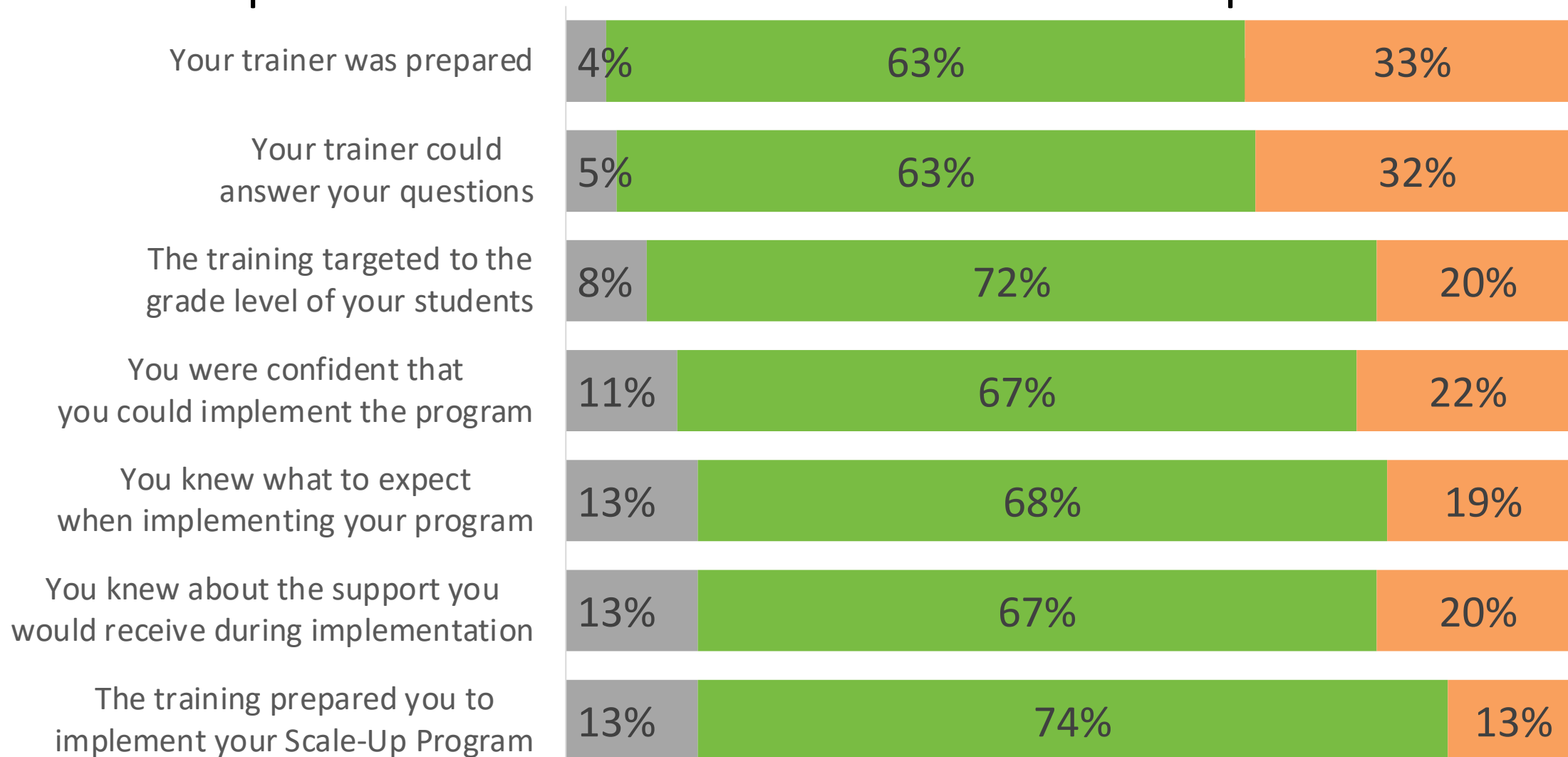
Most awards were programs for **elementary grades**



A projected 71,193 students participated in STEM Scale-Up Programs in 2020-2021

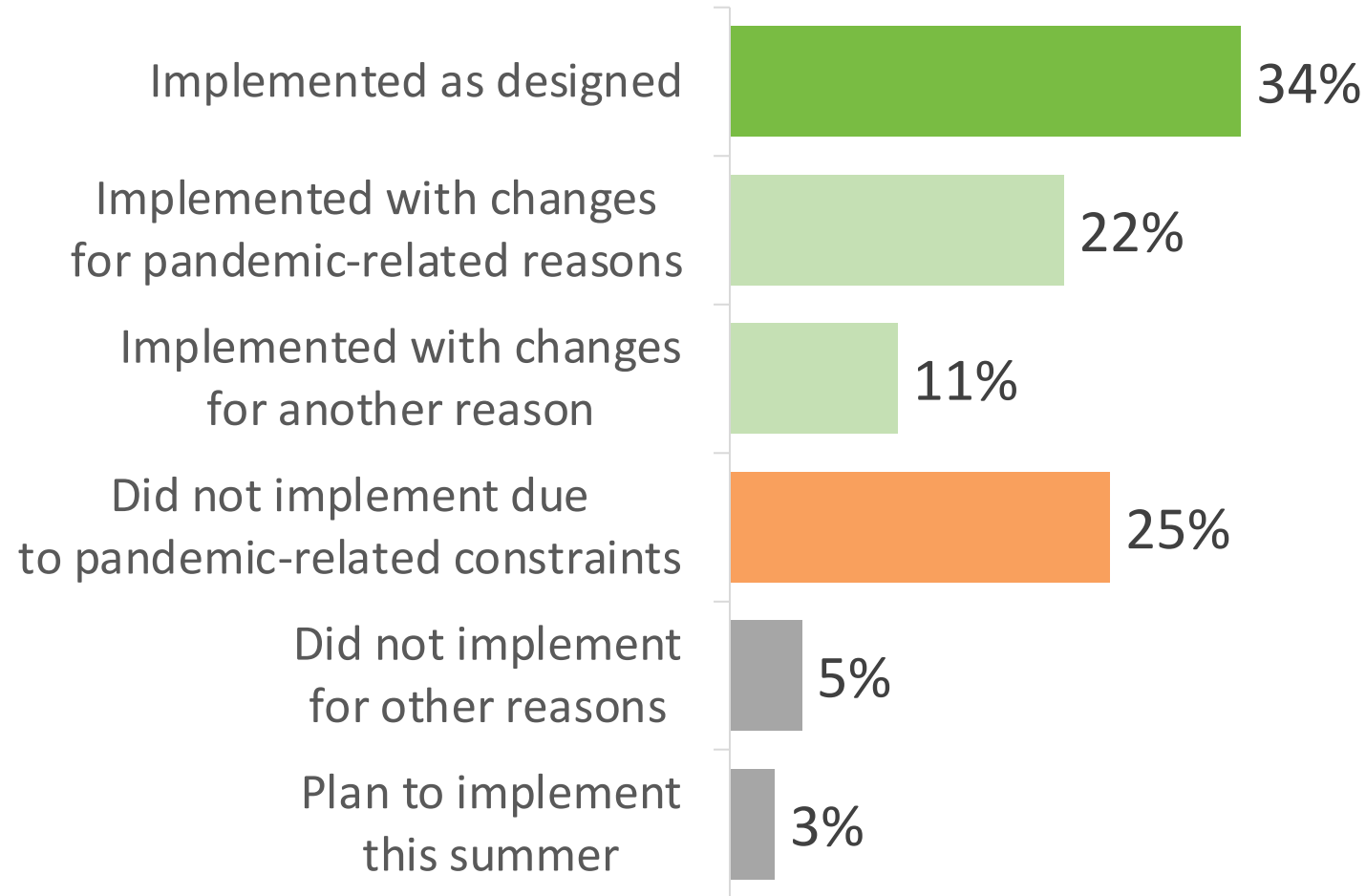


9 in 10 educators reported that the professional development **met** or **exceeded** their expectations

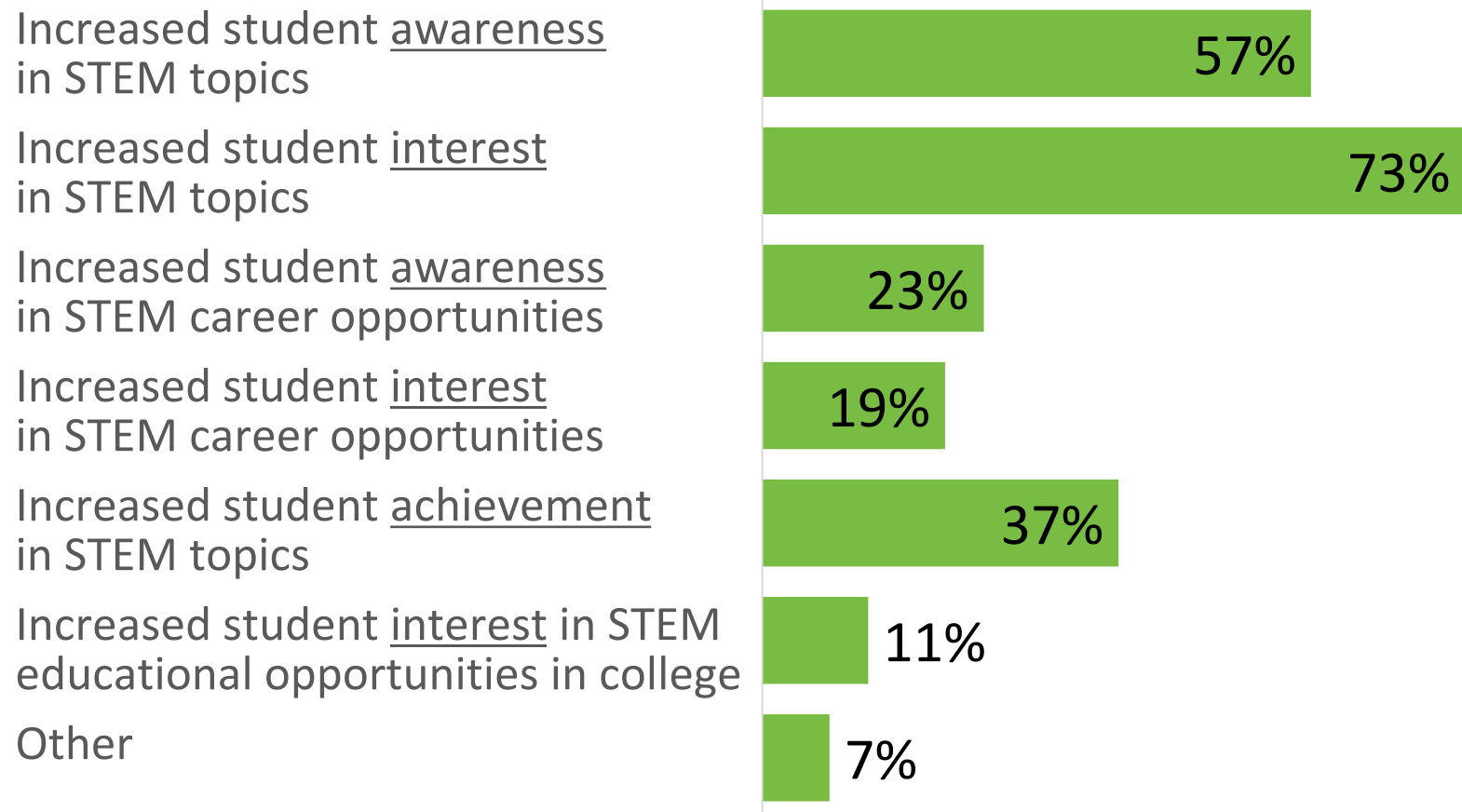


Nearly **two-thirds (67%)** of educators were able to implement to some degree in 2020-2021

Pandemic-related constraints prevented **25%** of educators from implementing their Scale-Up Program, but nearly all (94%) planned to use the program in 2021-2022.



Three-quarters (78%) of educators observed **increased student interest** in STEM following STEM Scale-Up program participation



Educator views: Impacts on STEM Education

- Increased awareness and excitement in STEM
- Raised interest in STEM careers and educational opportunities
- Provided practical, hands-on learning experience
- Built critical thinking skills, problem-solving skills, and opportunities for creativity
- Supplemented existing curriculum and provided pedagogical enrichment

Educator views: Impacts on STEM Education

*Provided some **alternative ways for students to interact with math** content rather than the traditional whole group lesson delivery with whole/small/independent practice. It's always **great when kids can use actual manipulatives, especially in this last year when everything has been so screen and technology oriented.***

Educator views: Enhancing Teachers' Skills and Classroom Curriculum

- Improved classroom curriculum/materials and aligning with current standards

*Before this, computer science was something we weren't really able to approach in programming as our staff does not have much background in it or a way to translate it to a fun program for kids to learn about it. **The CSF provided us building blocks to progress towards better computer science programming.***

- Cultivated teachers' skills

*I felt that the STEM Scale-Up program constantly is giving me **greater tools for my toolbox.** The students were able to see another side of STEM that they would not have been able to see otherwise.*

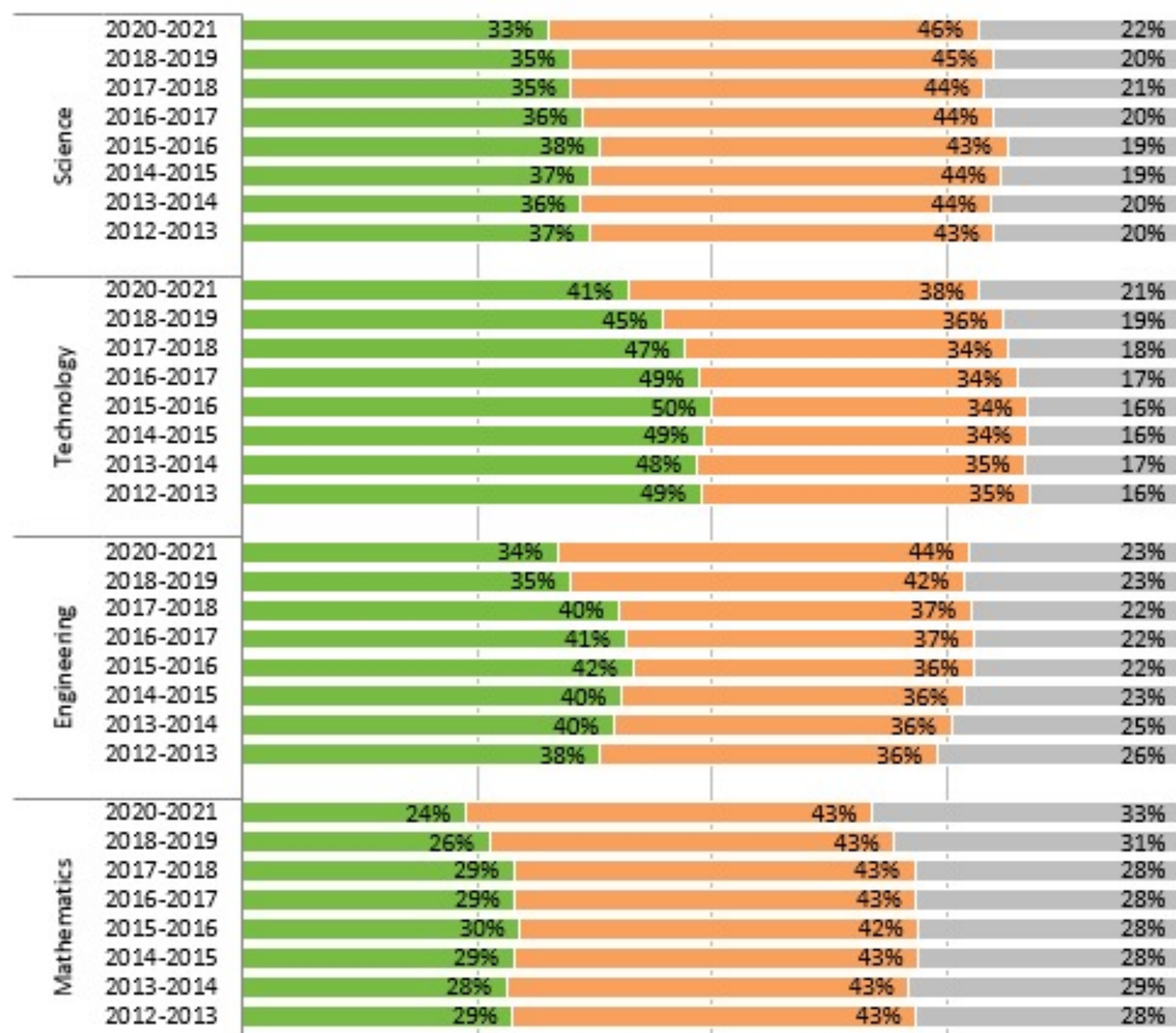
Iowa STEM Monitoring

Student Interest & Achievement

Matthew Whittaker & Catherine Welch

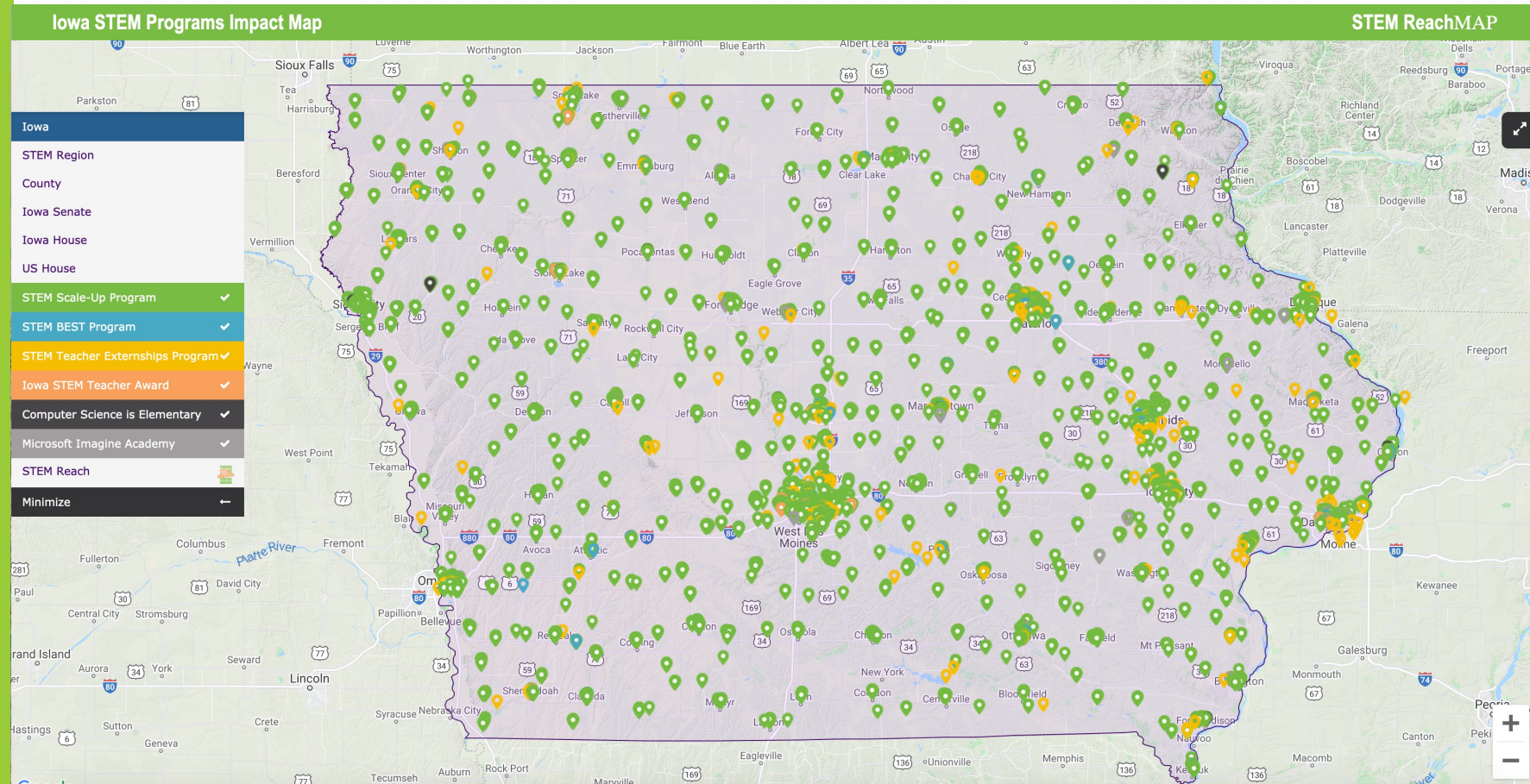


■ Very interested ■ Somewhat interested ■ Not very interested



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STEM Council Course Setting Aimed at Workforce Development

Jeff Weld, STEM Council Executive Director

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Upcoming Events and Announcements

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