



# IMPACT

**2017 MATE Regional Coordinator Meeting**

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# Impact

A dramatic landscape featuring a large, leafy tree in the center, illuminated by a bright, glowing light that resembles a lightning strike. The tree's trunk and branches are highlighted with a golden-yellow glow. The background consists of a dark, stormy sky with a prominent purple lightning bolt striking down from the upper right. The foreground is a field of tall, golden-brown grass, with a faint, glowing path leading towards the tree. The overall scene conveys a sense of power, energy, and impact.

STEM Career Awareness

21<sup>st</sup> Century Skills

STEM Career Interest

Ability to Apply STEM to  
Real-Life Problems

Interest in Learning STEM

Ability to Communicate  
Engineering Design & Process

STEM Knowledge & Skills

Education & Career Decisions

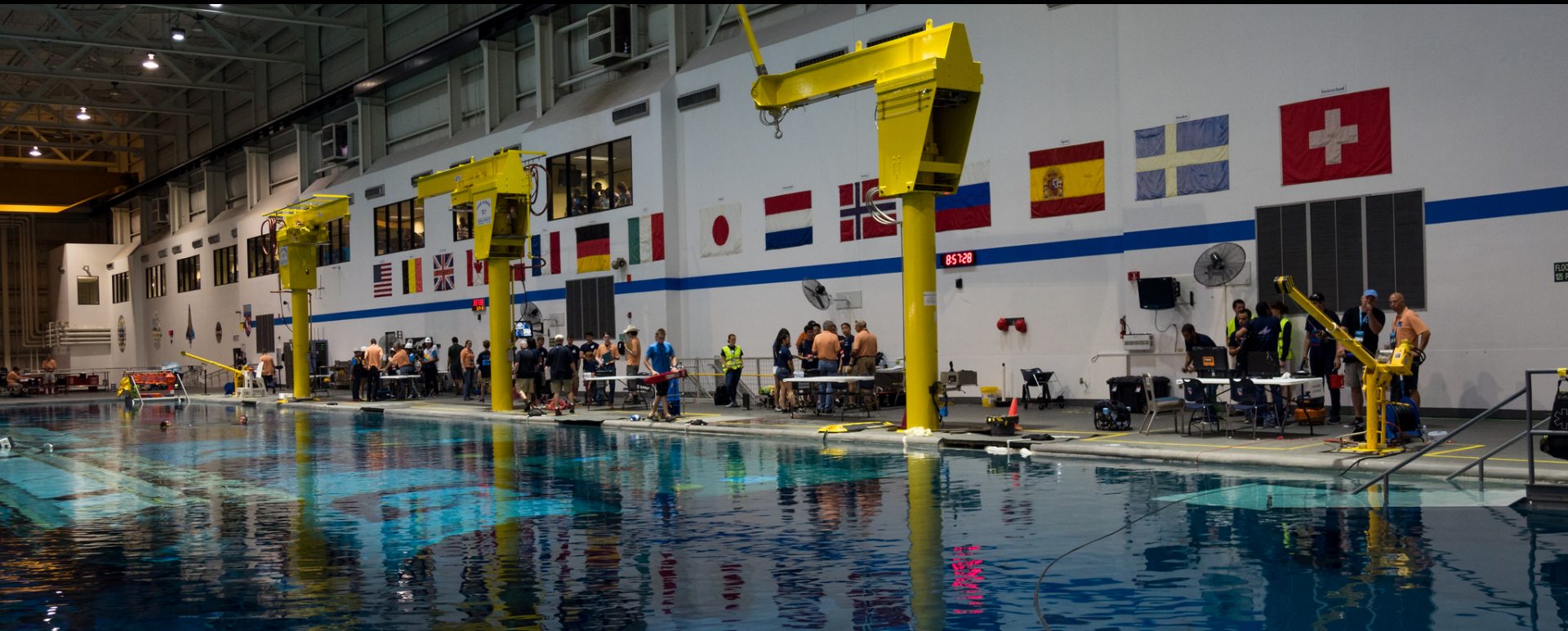
# Data Sources

2016 Post-Competition Surveys

Students:  $N = 2,149$

Teachers/Mentors:  $N = 342$

Parents:  $N = 424$





STEM  
Career  
Awareness  
& Interest

# STEM Careers:

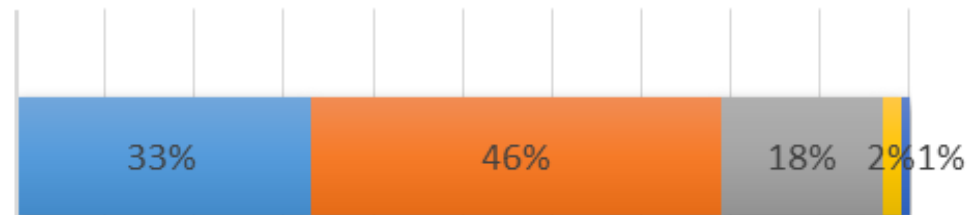
79% = more aware

77% = more interested

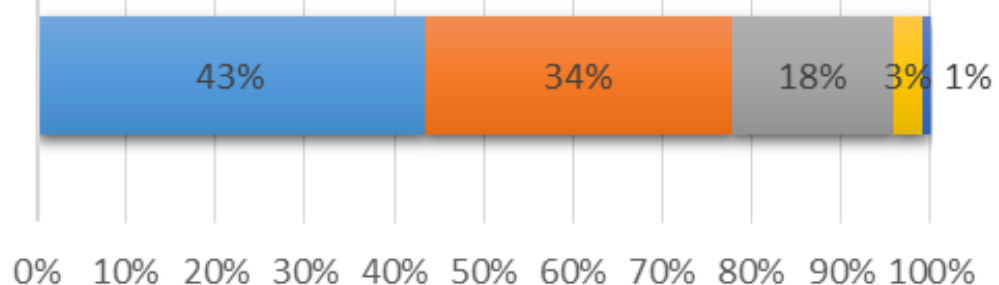
## Student Awareness and Interest in STEM Careers

Strongly Agree Agree Neutral Disagree Strongly Disagree

Because of my ROV project, I know more about careers in science, technology, engineering, and math.  
(N=2,148)



Because of my ROV project, I am more interested in a career in science, technology, engineering, and math.  
(N=2,149)



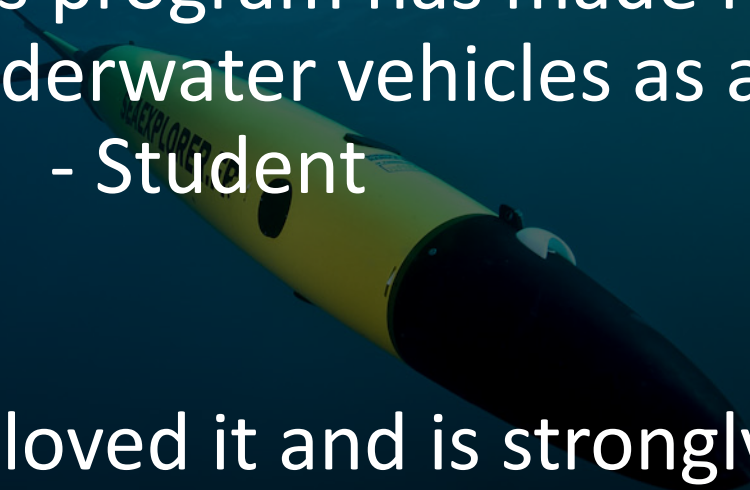
# Quotes: Influence on Career

“Participating in this program has made me interested on working with underwater vehicles as a career.”

- Student

“He just absolutely loved it and is strongly considering a career in Marine Engineering.”

- Parent



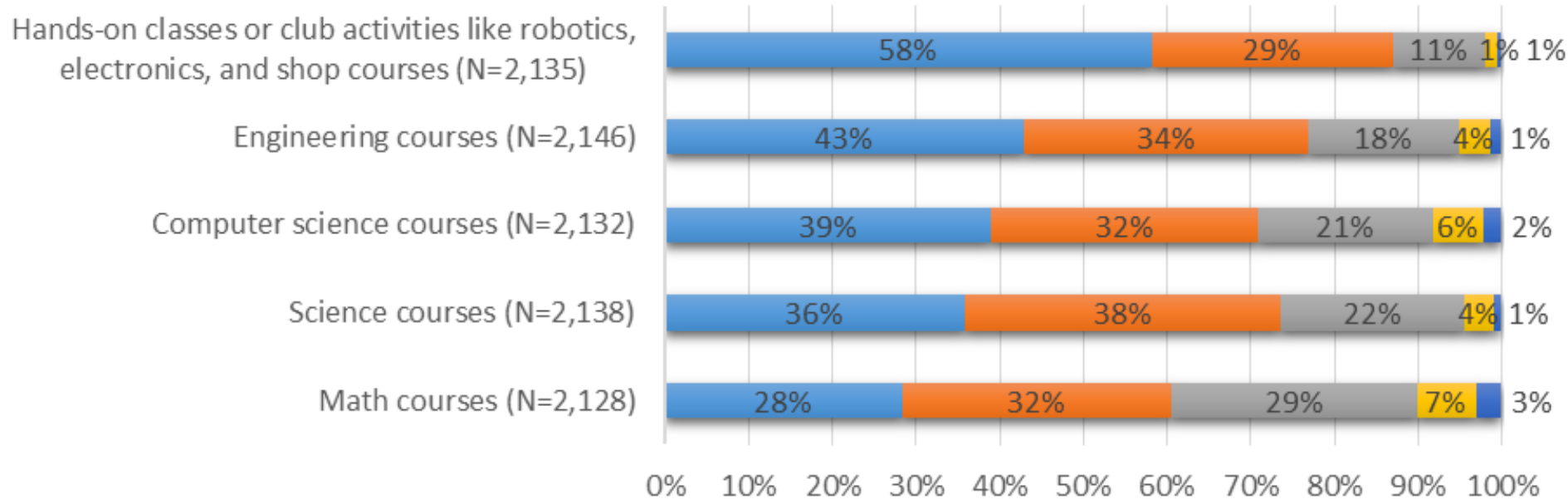
# Interest in Learning STEM



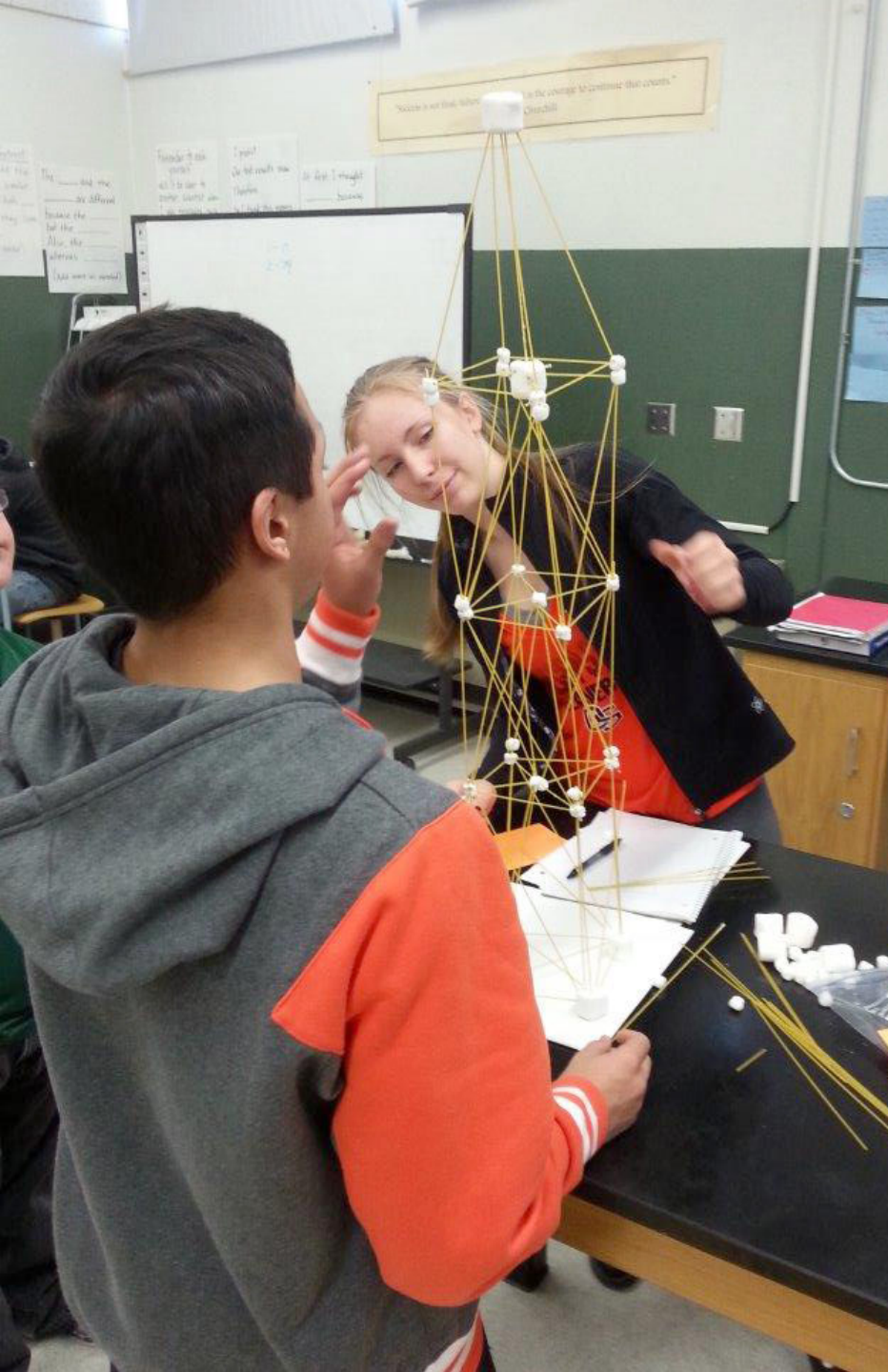
# 85% = ROV project made them want to learn more STEM

## Student Interest in STEM Courses: "Because of my ROV project, I am more interested in taking..."

■ Strongly Agree ■ Agree ■ Neutral ■ Disagree ■ Strongly Disagree





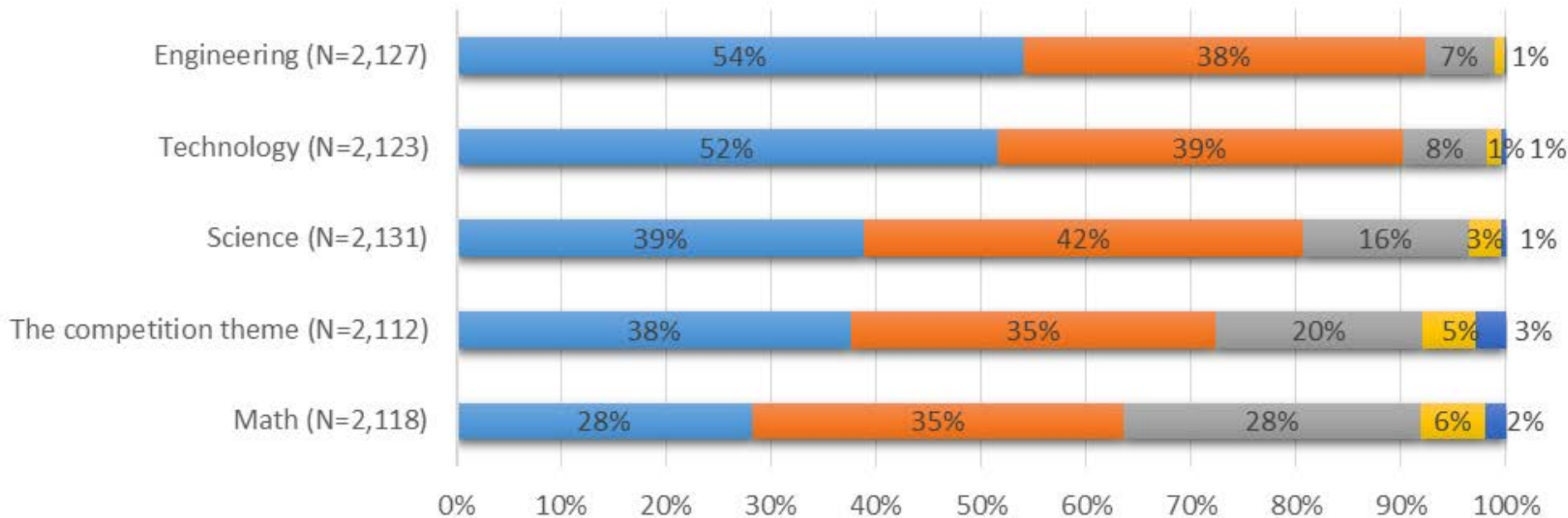


# STEM Knowledge and Skills

“The MATE competition was an amazing experience.  
It helped me in a lot of school subjects and skills.”  
- Student

**Student STEM Skills and Knowledge:  
"Because of my ROV project, I increased my skills and  
knowledge in..."**

■ Strongly Agree ■ Agree ■ Neutral ■ Disagree ■ Strongly Disagree

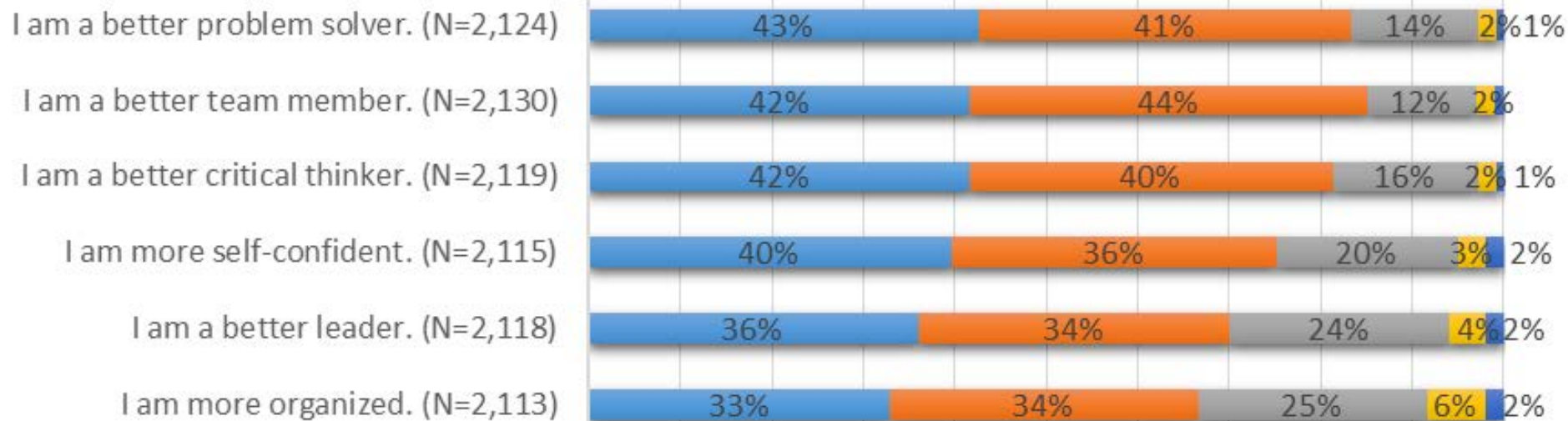


# 21ST CENTURY SKILLS

LEARNING FOR LIFE IN OUR TIMES

## Student 21st Century Skills: "Because of my ROV project..."

■ Strongly Agree ■ Agree ■ Neutral ■ Disagree ■ Strongly Disagree

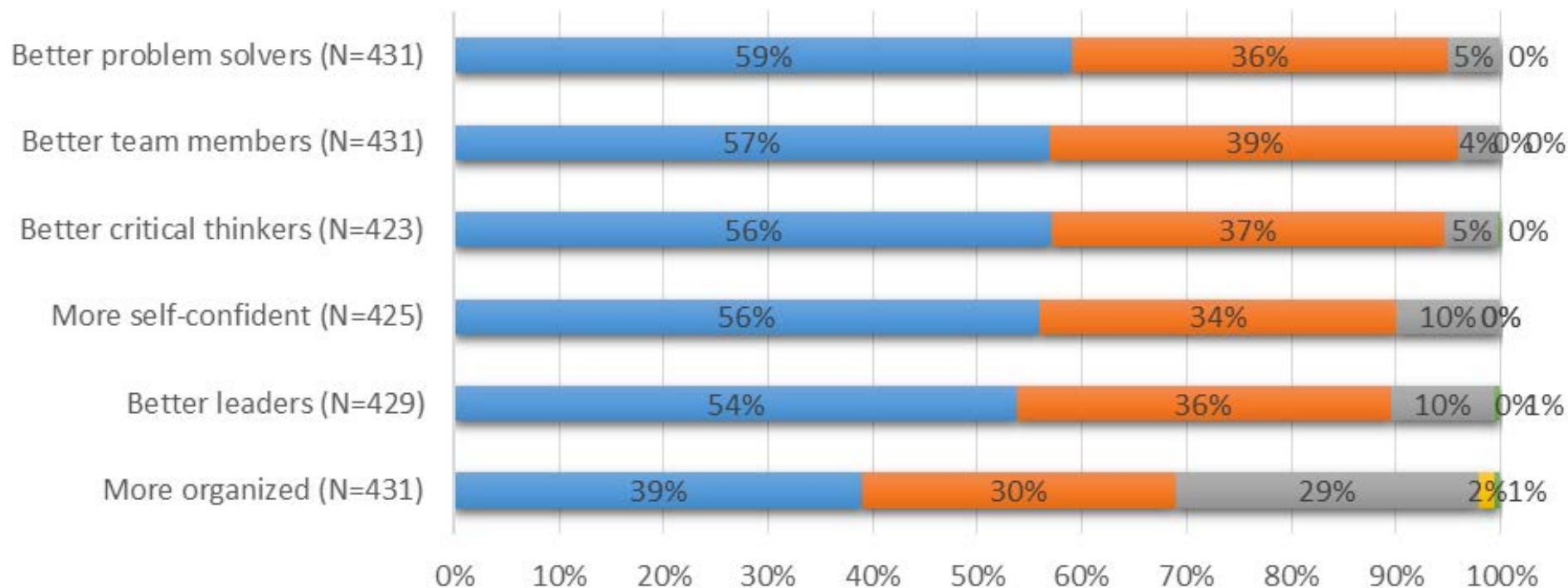


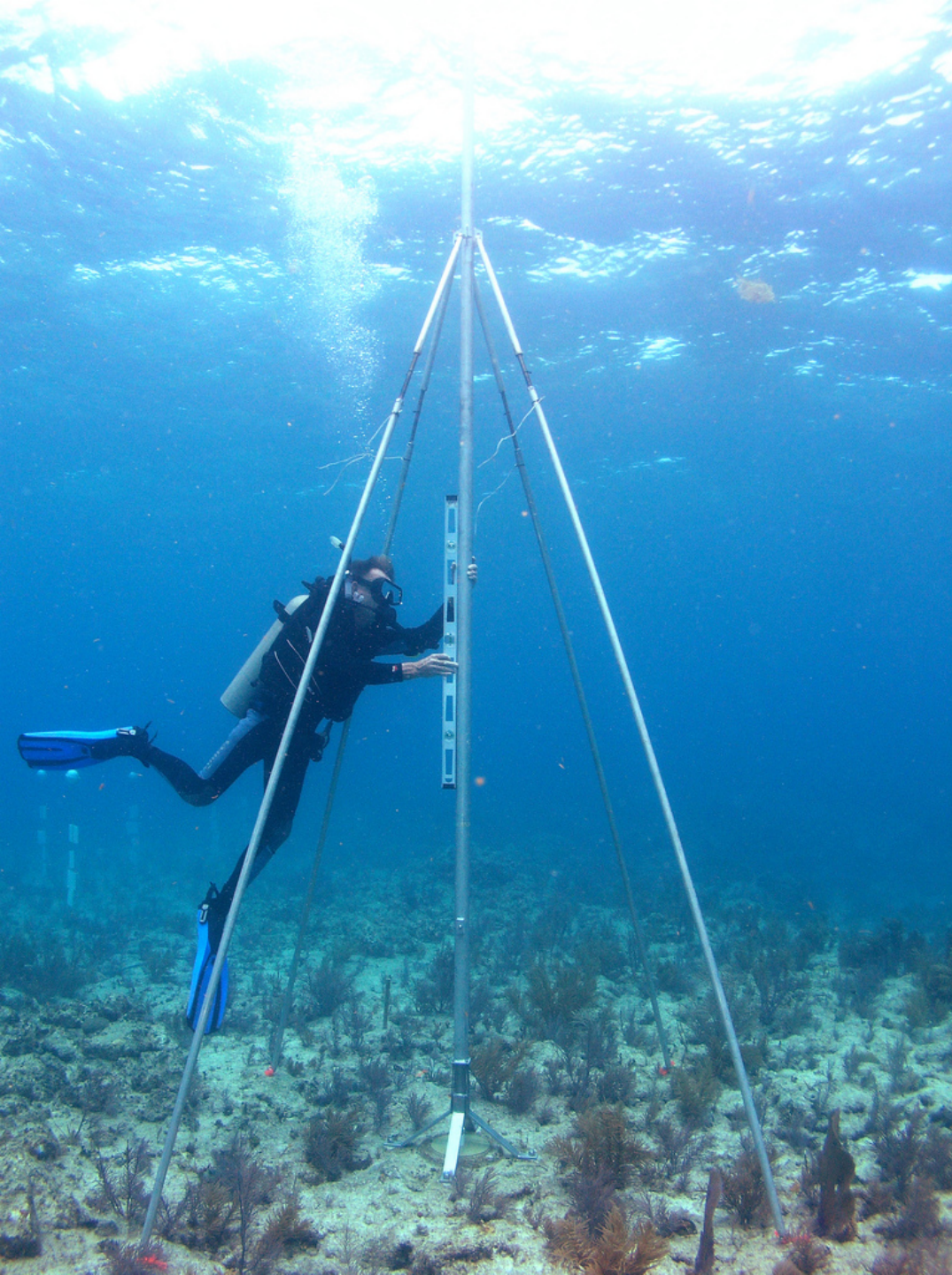
“He has grown immensely - self-confidence, maturity, even compassion. He now considers himself a leader.”

- Parent

### Parent Observations of Student 21st Century Skills: "Because of the ROV project, my child(ren) are..."

■ Strongly Agree ■ Agree ■ Neutral ■ Disagree ■ Strongly Disagree ■ Don't Know



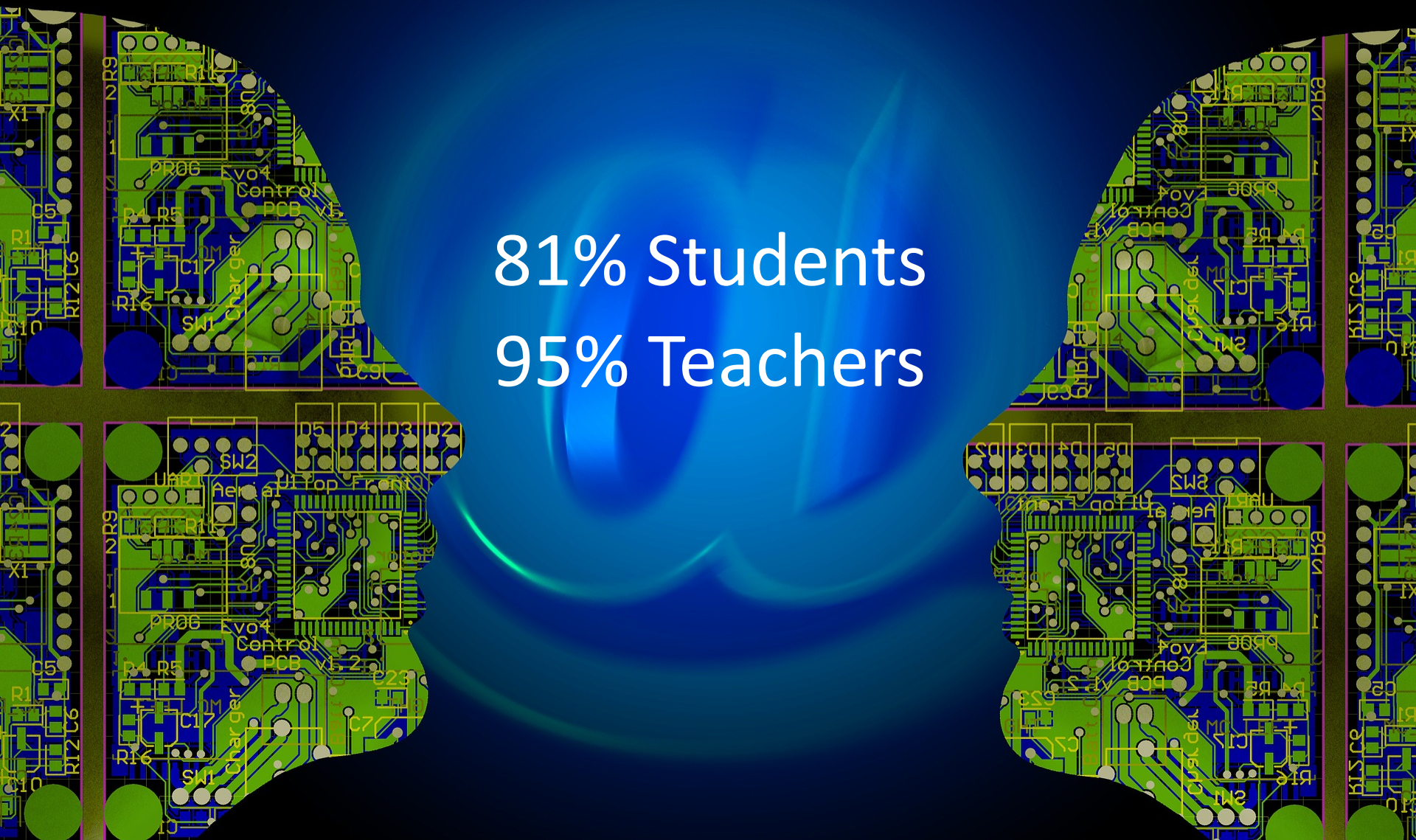


Ability to apply  
STEM to real-  
world problems:

84% students  
98% teachers  
95% parents

# Ability to Communicate Engineering Design & Process

81% Students  
95% Teachers





## First-year vs. Multi-year Participants

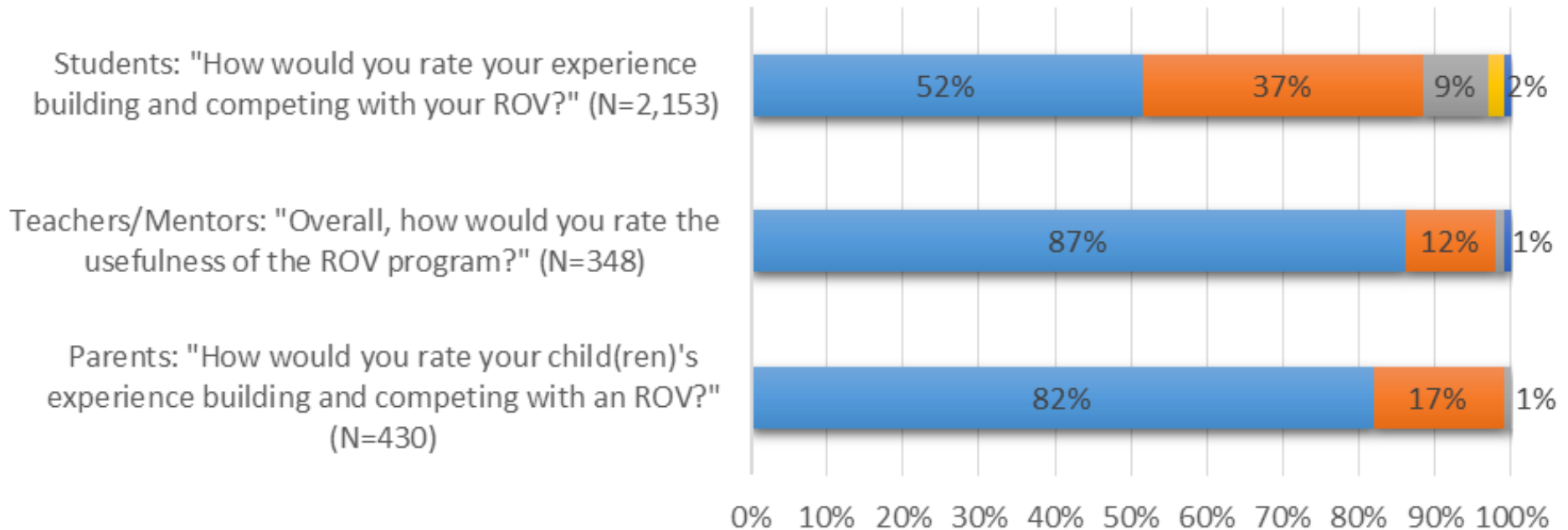
Statistically significant differences: Multi-year participants...

- Higher levels of awareness of and interest in STEM careers
- Greater gains in interest in taking STEM courses
- Stronger improvements in STEM knowledge and skills
- Larger increases in 21st Century skills
- Receipt of more awards, honors, and new educational/career opportunities

“This program opened my eyes to the world of technology and the use of courses such as math and science in the real world, which are not always taught in school.”  
- Student

## Overall Opinions of ROV Program: Students, Teachers/Mentors, and Parents

■ Excellent ■ Good ■ Fair ■ Poor ■ Very Poor





# Where are they now?

1. Alumni Survey
  2. WA State Follow-up
  3. National Student Clearinghouse Match
- 

# ALUMNI SURVEY

Preliminary response rate: 10.2%  
(432 respondents)



# Competition Participation

Length of student competition career:

- Range: 1-9 years, Avg. 2.2 years

Competition years: 2006-2015

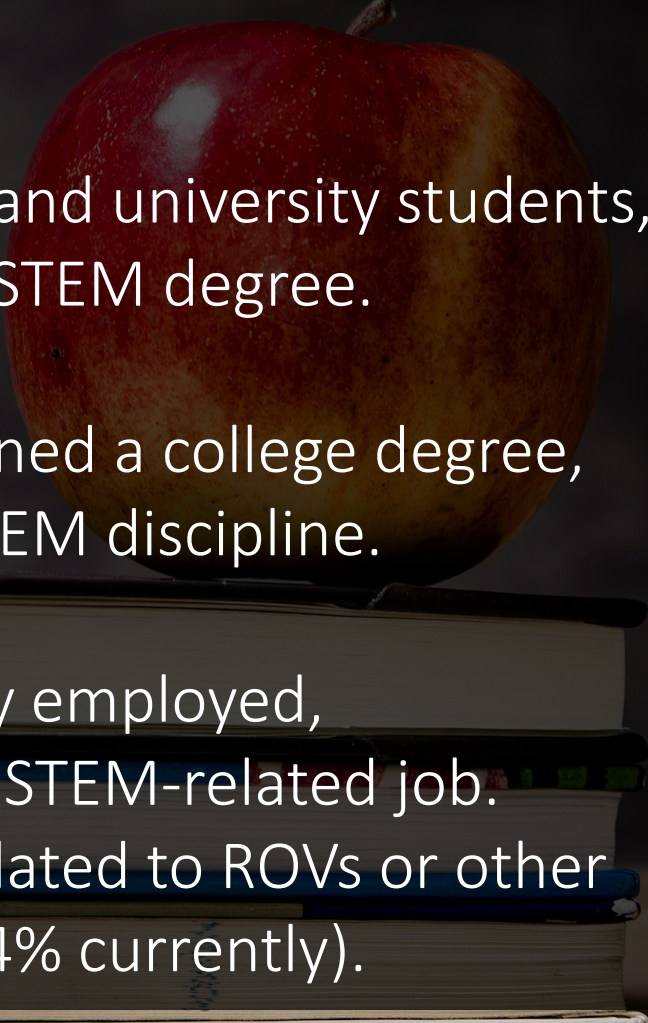
Competition classes:

- 11% SCOUT
- 3% NAVIGATOR
- 36% RANGER
- 36% EXPLORER
- 29% Don't know

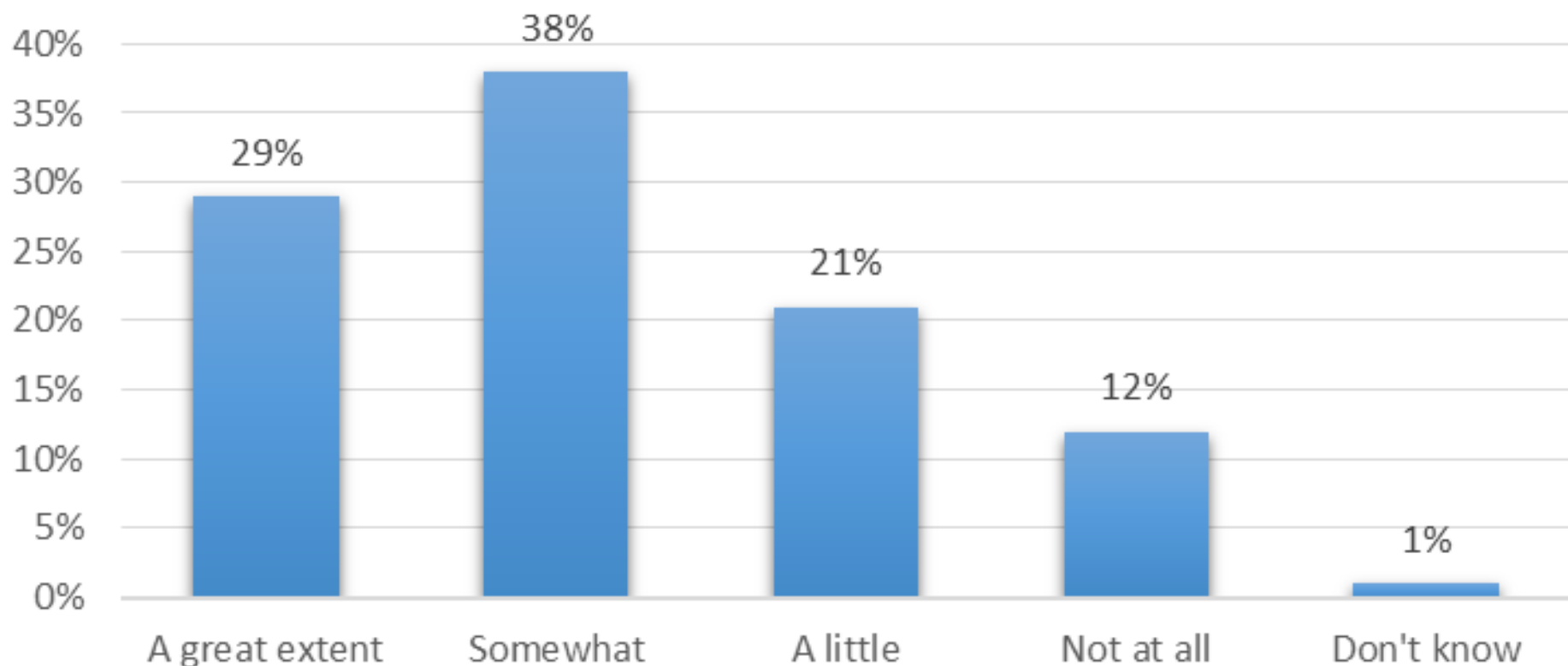
Full circle:

- 9% alumni became classroom/club mentors, 6% judges, 4% teachers leading teams

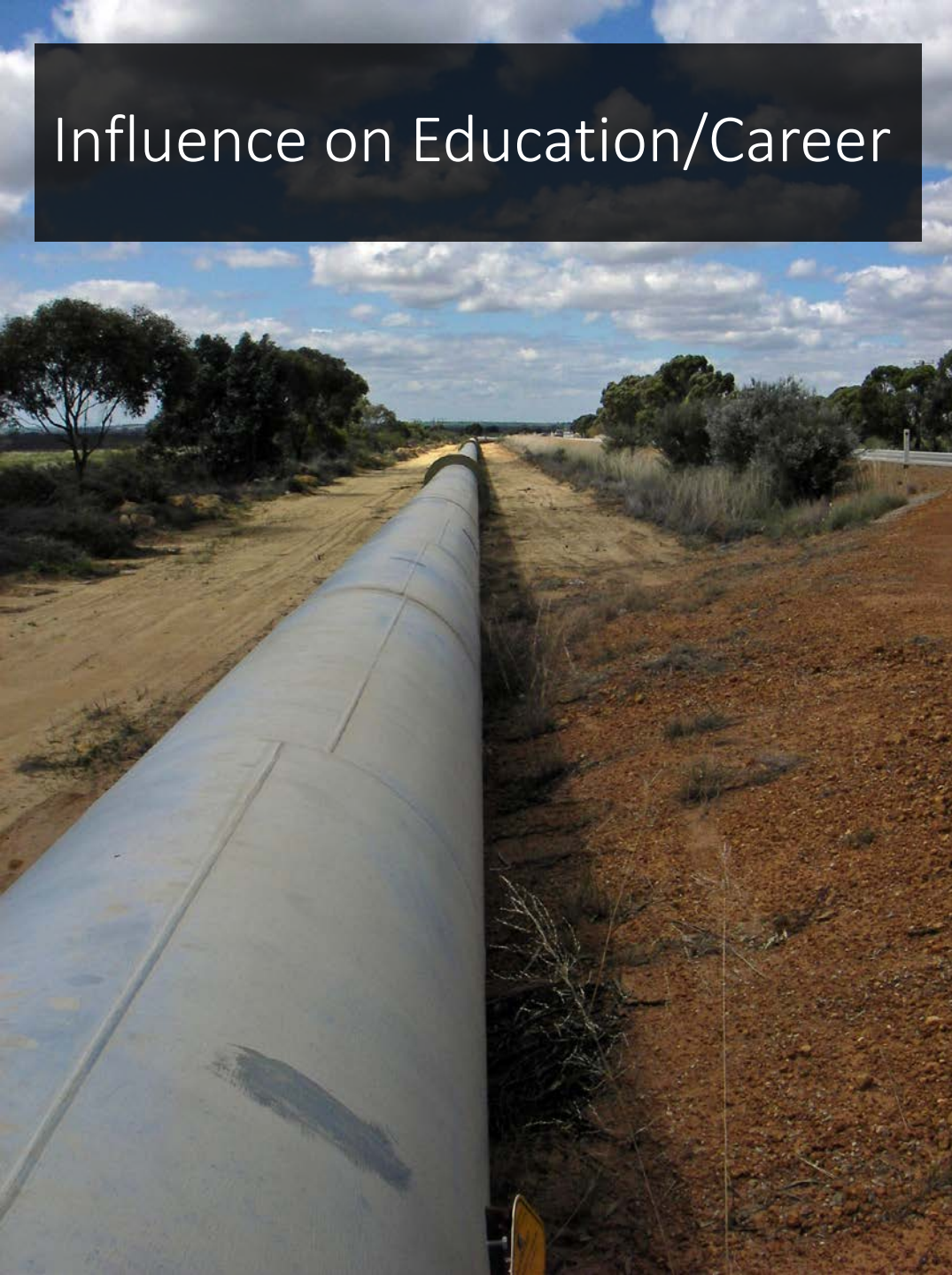
# Education and Employment

- Highest level of education ranges from high school to doctorate
  - Among the 236 current college and university students,
    - 85% are studying towards a STEM degree.
  - Among the 220 alumni who earned a college degree,
    - 85% earned a degree in a STEM discipline.
  - Among the 320 alumni currently employed,
    - 73% are currently working a STEM-related job.
    - 22% have worked in a job related to ROVs or other underwater technologies (14% currently).
- 
- A red apple with a small stem is positioned on top of a stack of several books. The books are of various colors, including blue, white, and dark green. The background is dark and slightly blurred, suggesting an indoor setting with a desk or table.

**"To what extent has participating in the MATE ROV Competition program influenced your educational or career path?" (N=432)**

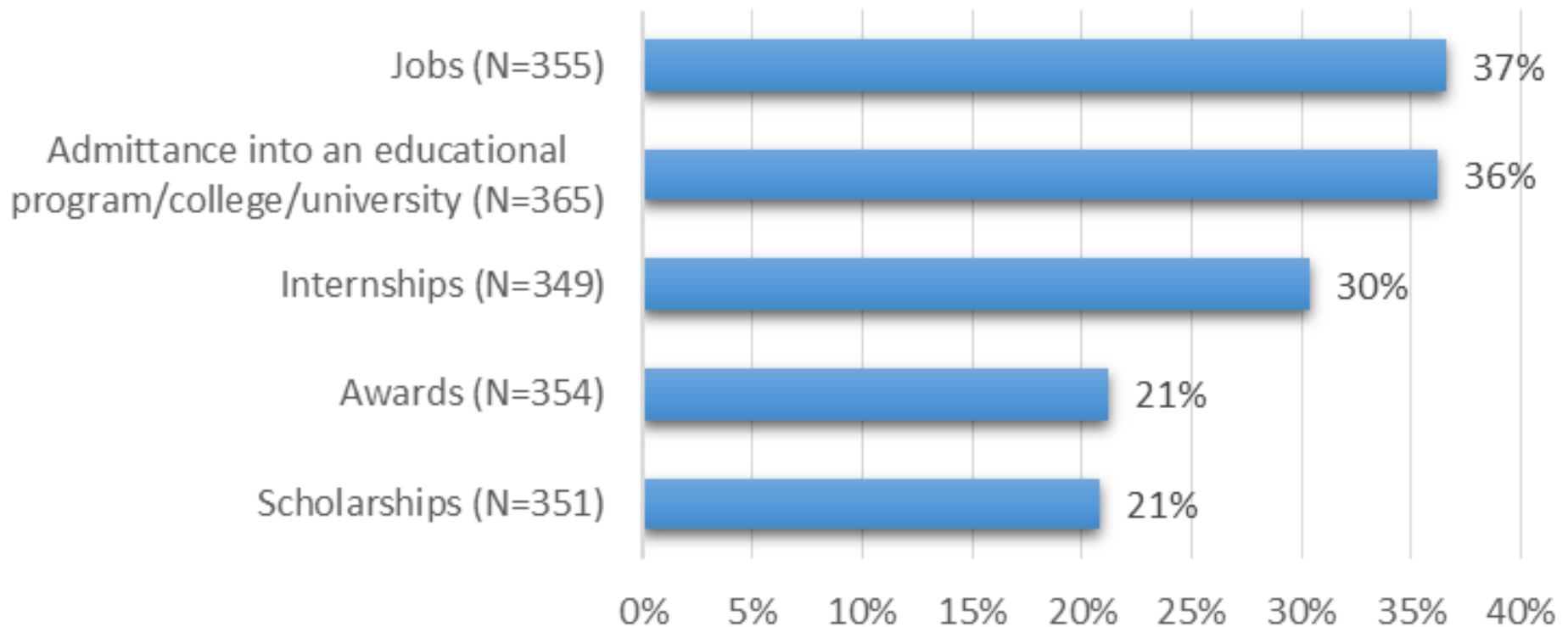


# Influence on Education/Career



# Competition's Role in Attainment of Educational/Career Milestones

**"Has participating in the MATE ROV Competition played a role in you attaining any of the following?"**



# Employment



“I did a ton of electrical design as part of my involvement in the ROV team. It was as a result of that experience that I got hired for my co-op jobs, which led me to being hired full-time.”

“I am currently an ROV technician and pilot for Oceaneering. The competition gave me exposure to the use of ROVs and allowed me to network with the right people, landing me a job.”



# Admittance into College/University

A photograph of a large, multi-story brick university building with a central clock tower and a flagpole. The building is set against a clear blue sky and is surrounded by green grass and trees. The image is slightly dimmed to allow text to be overlaid.

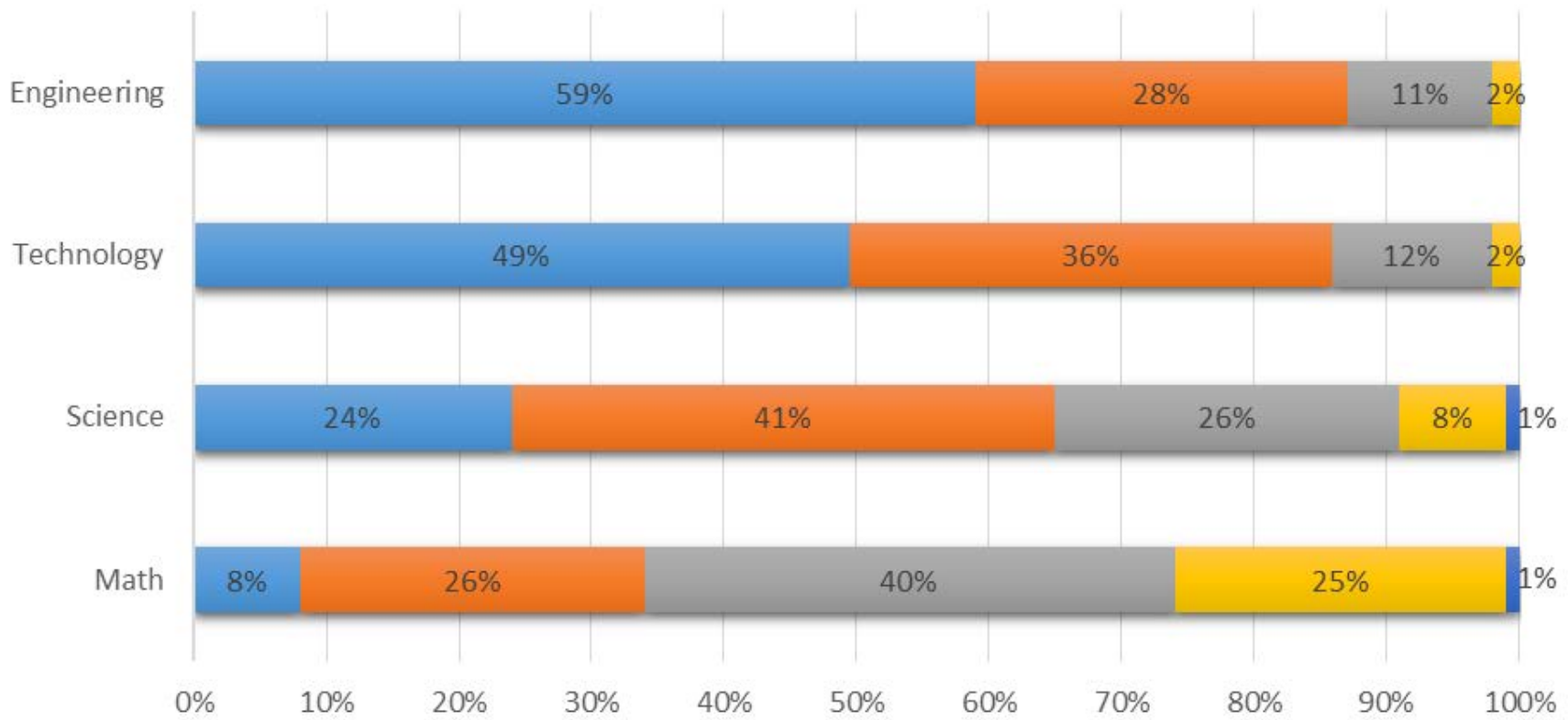
“In my acceptance letter into college, they referred to the MATE competition on my resume.”

“George Fox University was very impressed with my work through MATE. They had never heard of such a program and were very excited about it.”

# Impact on STEM Skills

**"To what extent did the ROV program help strengthen your knowledge or skills in science, technology, engineering, and math?" (N=426)**

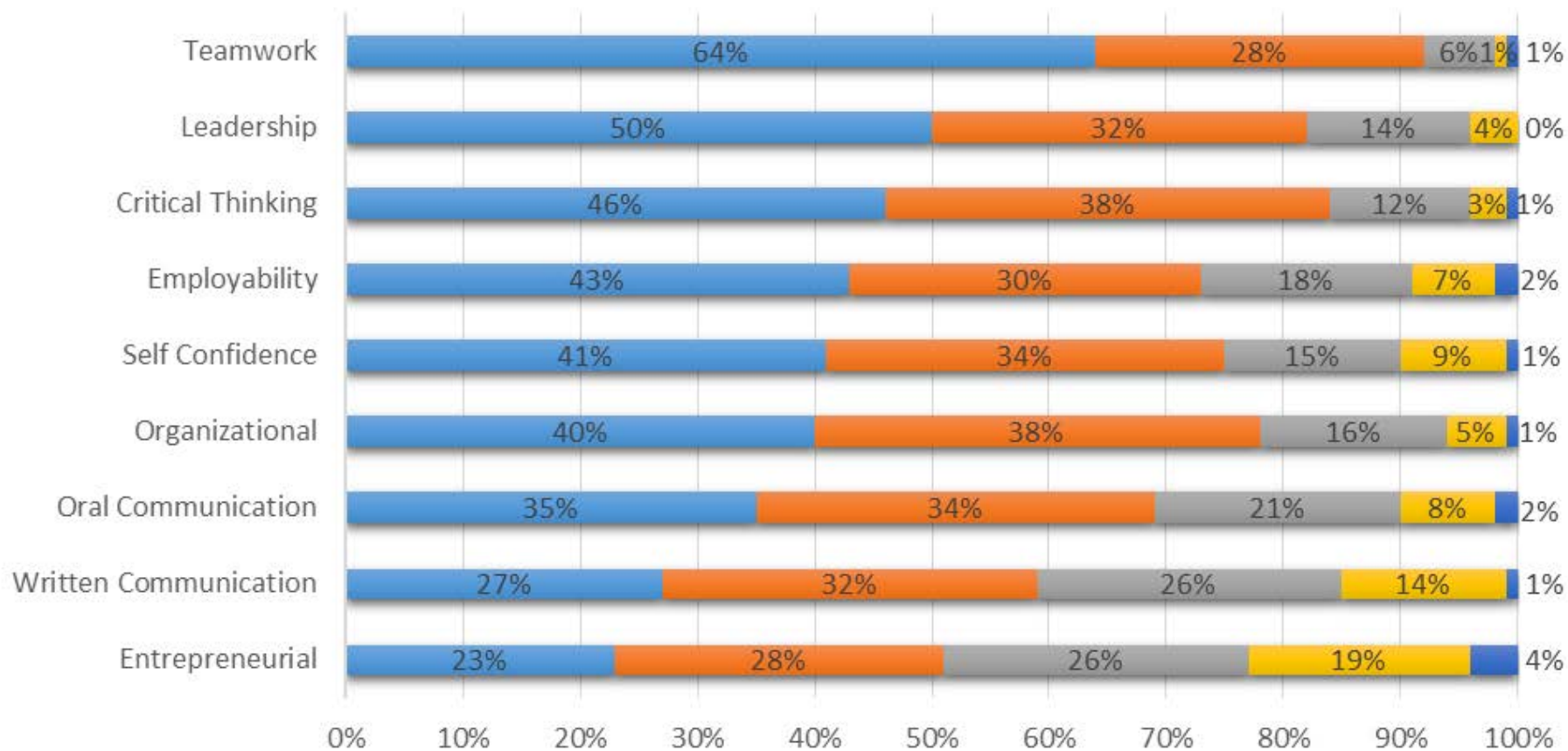
■ A Great Extent ■ Somewhat ■ A Little ■ Not at All ■ Don't know



# Impact on 21<sup>st</sup> Century Skills

"To what extent did the ROV program help strengthen your skills in the following areas?" (N=440)

■ A Great Extent   ■ Somewhat   ■ A Little   ■ Not at All   ■ Don't know



# National Student Clearinghouse Data Match

3,850 alumni sent for matching  
Competition years: 2006-2014

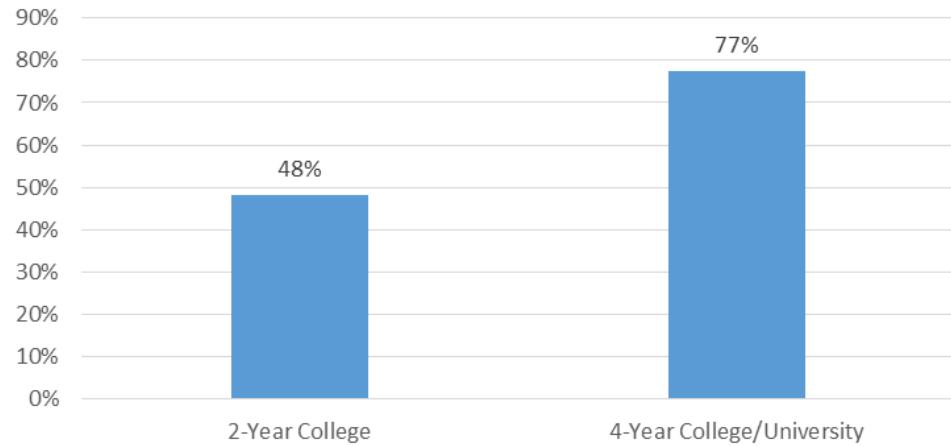
Age: 18+

Live in United States

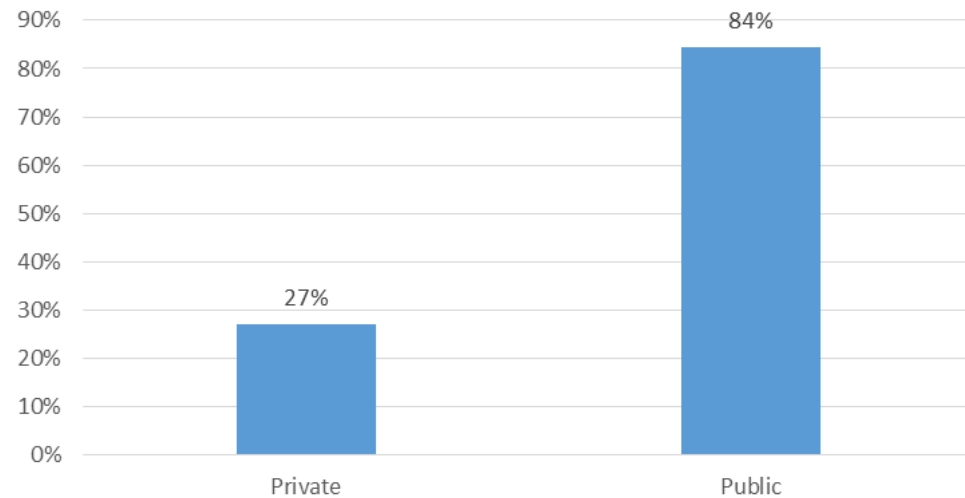
2,421 found in database

# College/University Type

Two-Year or Four-Year College/University  
(N=2,421)



Public or Private College/University (N=2,421)



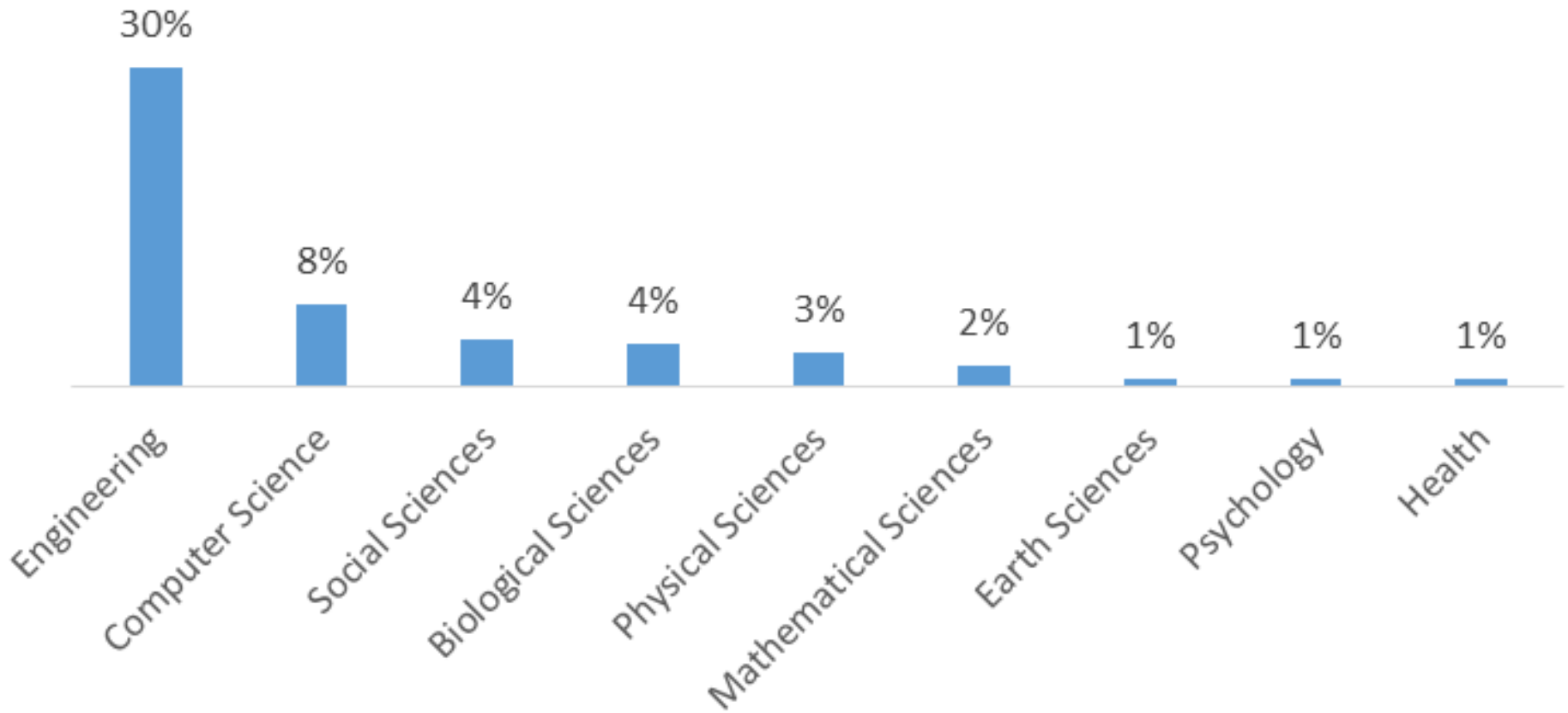
Percentage STEM

NSF-codes: 55%

Hand-codes: 67%

# Majors

College Majors: NSF STEM Categories  
(N=1,445)



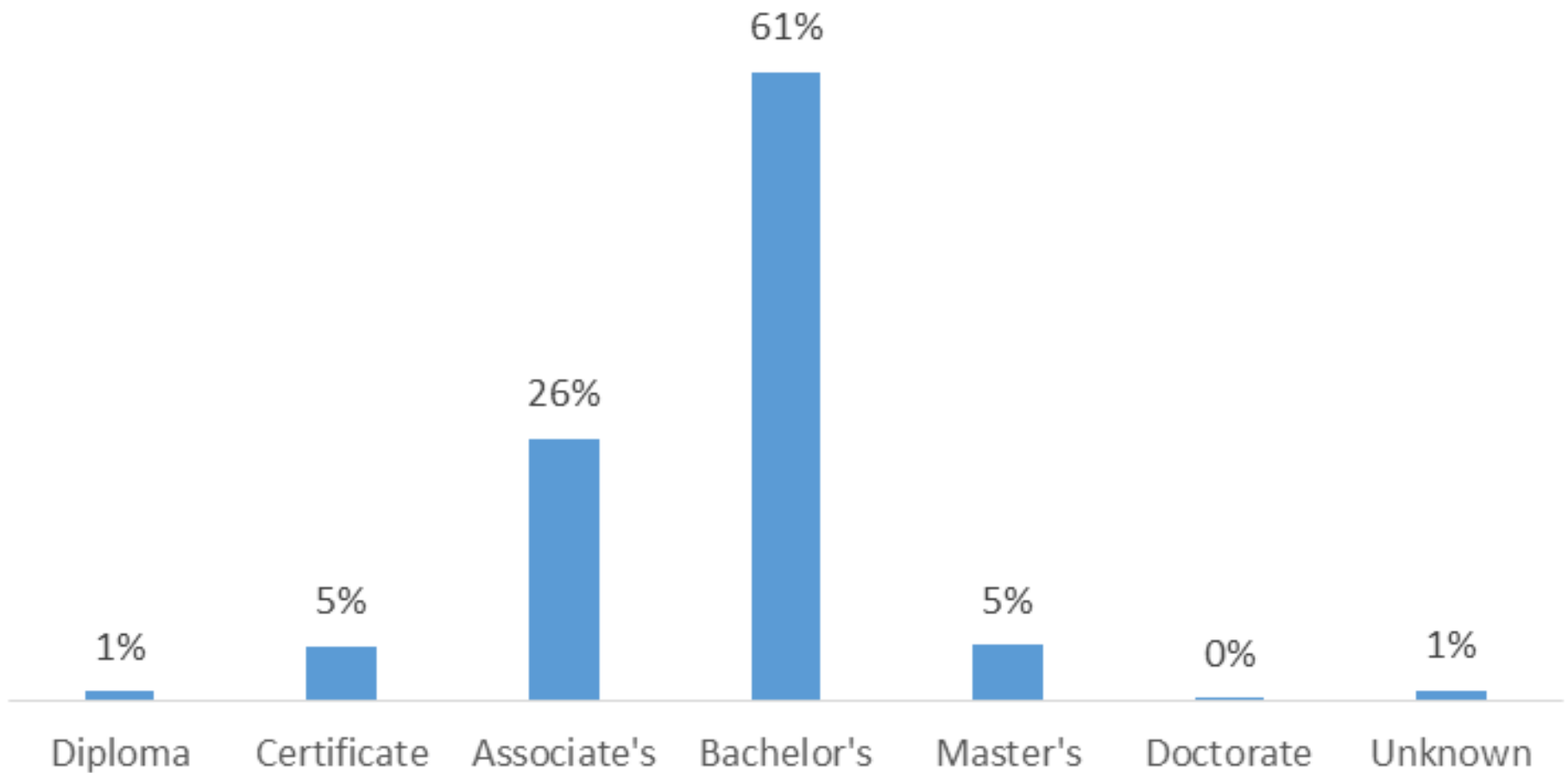
# Degrees

A large group of graduates in black caps and blue stoles at a ceremony. The graduates are seen from behind, filling the frame. The text is overlaid on the center of the image.

555 Students Earned 765 Degrees

# Degrees

Type of Degrees Earned (N=695)

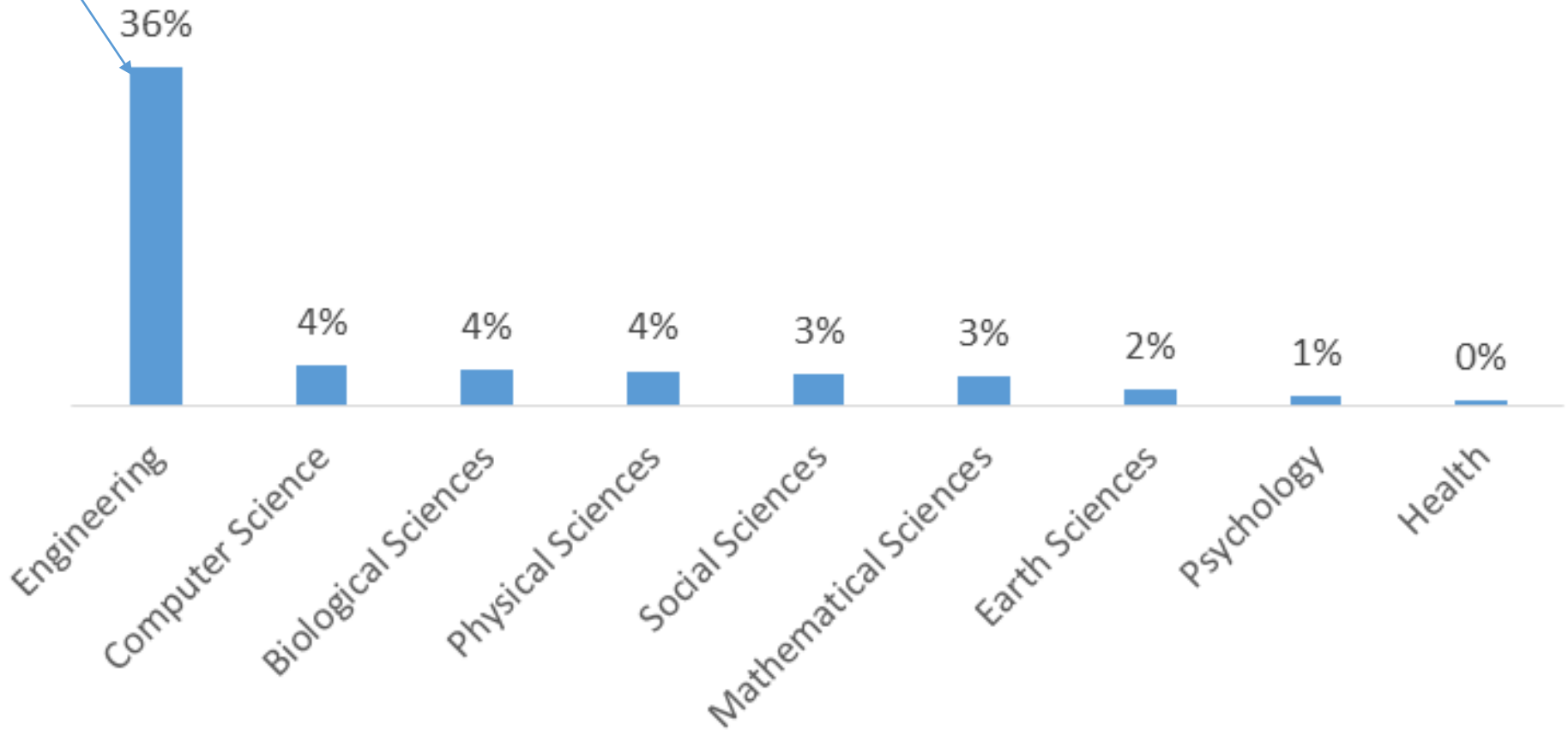




# Degrees

Degrees: NSF STEM Categories  
(N=555)

Comparison:  
1% Bachelor's  
Nationwide in  
Engineering



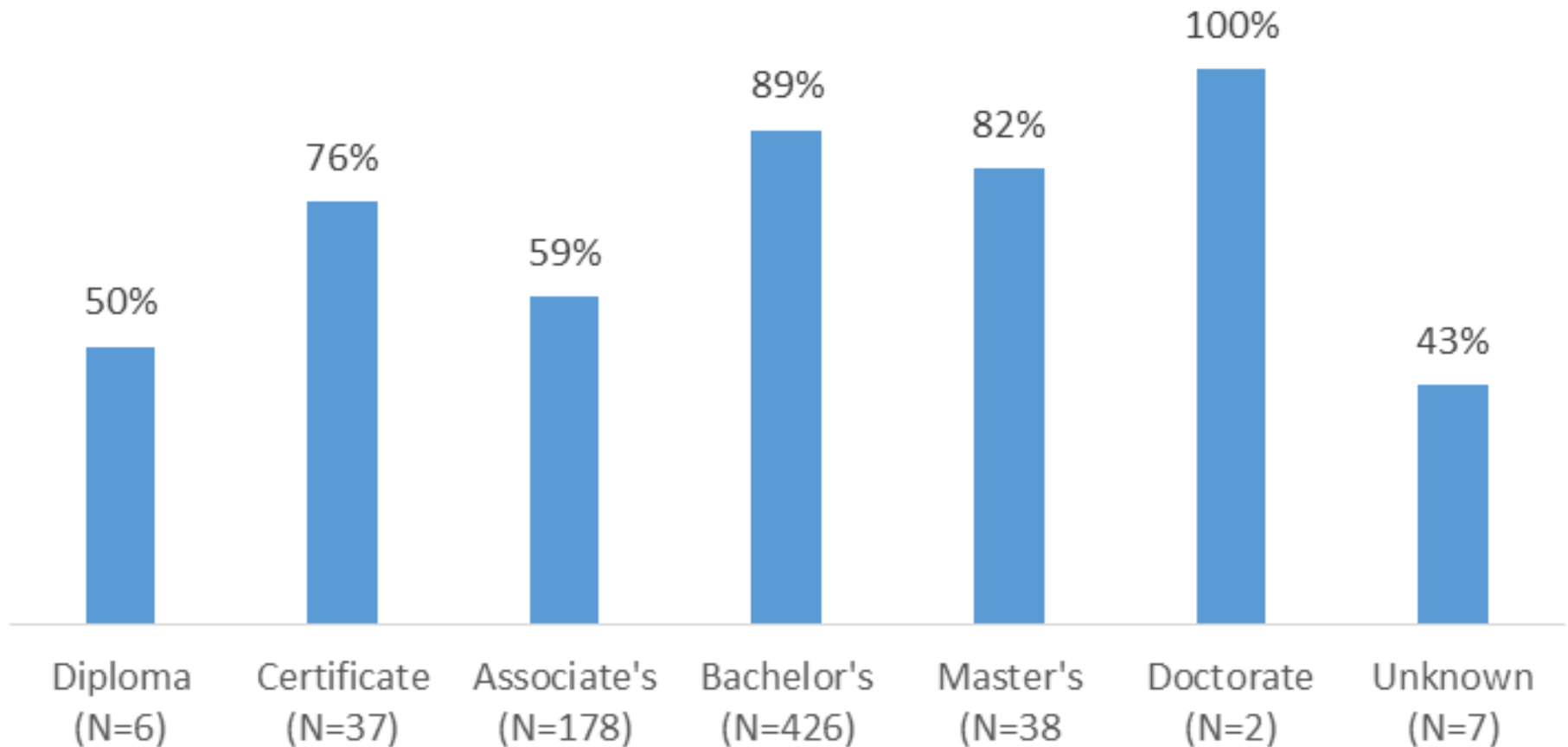
Percentage STEM

NSF-codes: 57%

Hand-codes: 80%

# Degrees

Percentage of STEM Degrees per Degree Type



# 2015 Summer Institutes

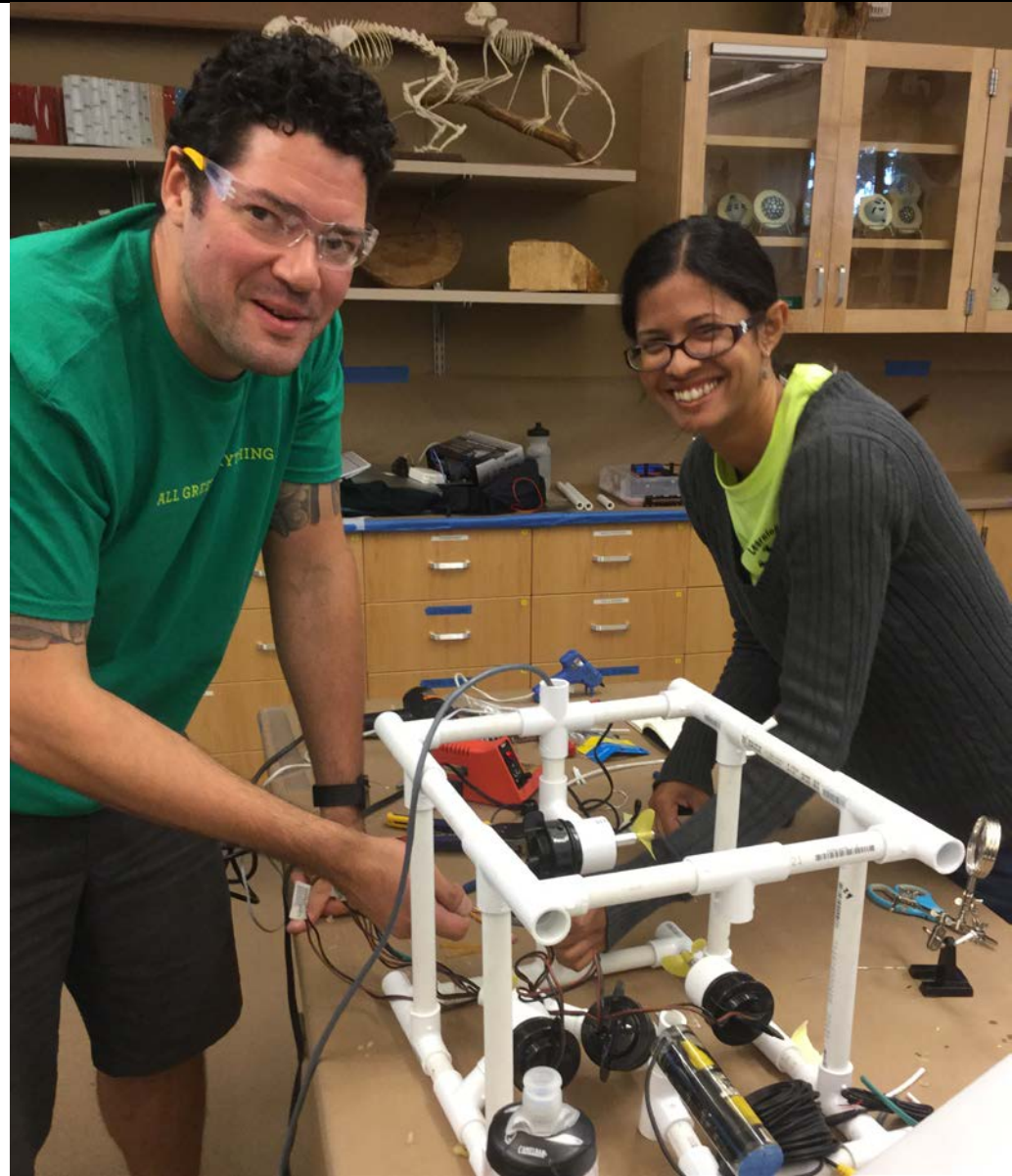
2 Institutes: Introductory & Intermediate

40 participants teach 4,522 students

Intermediate Institute...

One-year follow-up survey

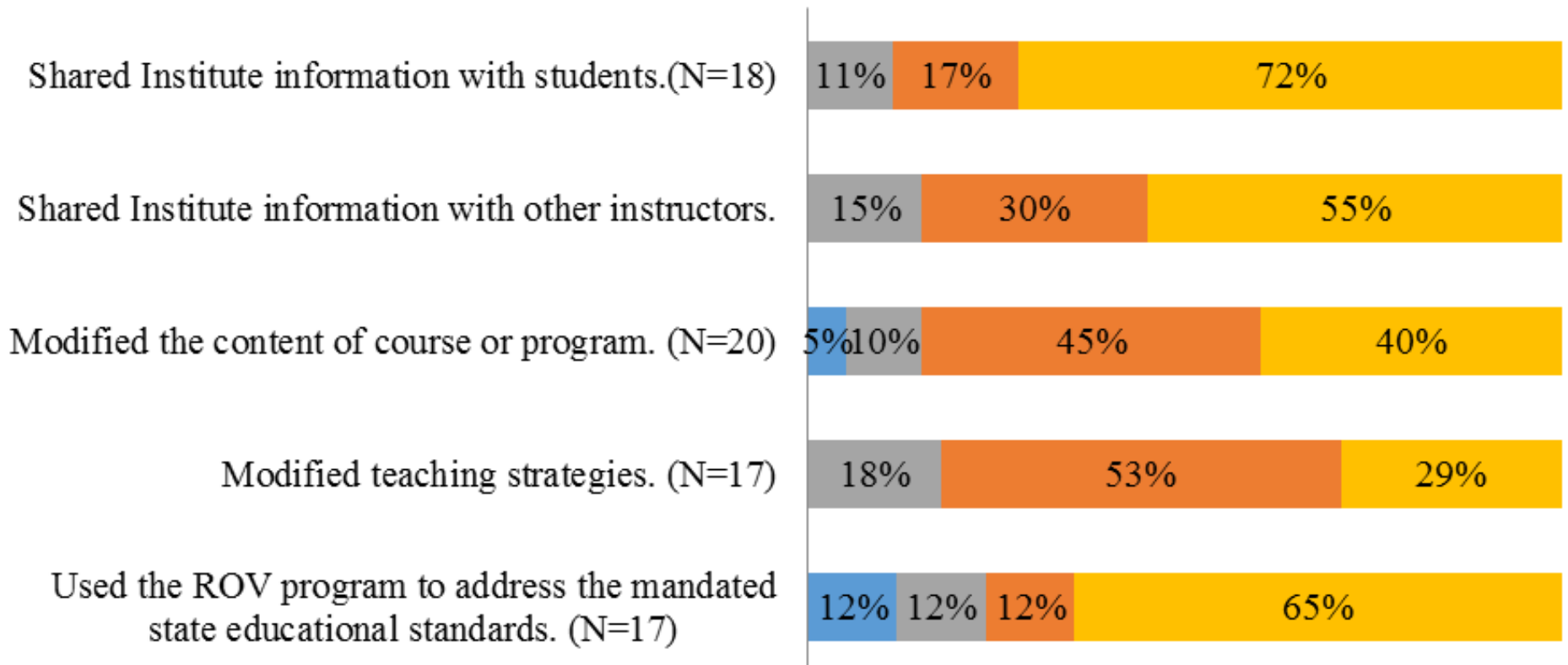
N=20, 100% response rate



# 2015 Summer Institute

## 2015 Summer Institute Follow-up Survey: Extent Teachers Implemented and Shared What They Learned at the Institute

■ Not at All   ■ A Little   ■ A Fair Amount   ■ A Great Deal



# 2015 Summer Institute

Since the Institute...

90% built an ROV with students

1,215 students

250 ROVs built

84% developed/improved a course

New courses/clubs served 1,090 students



# Closing Thoughts



“Thank you! Involvement in MATE has literally been a life saver for our son. He was struck with a chronic disease 4 years ago. His [ROV] club meetings the past 3 years were, at times, the only activity he could manage to participate in. He would conserve his energy all week to make the meetings.”

- Parent