YES WE MUST COALITION
COLLEGE SUCCESS FOR ALL

The Power of Community for STEM Student Success:

Four Yes We Must Coalition Member Schools Describe the Strategies and Impact of their NSF S-STEM Grant for Low-Income Students

The Yes We Must Coalition

- www.yeswemustcoalition.org
- 41 independent, nonprofit colleges and universities where 50% + undergrad enrollment Pell-eligible
- Committed to collaborating to make changes to increase persistence rates for low-income students
- Do that working together through grant projects and YWM projects on strategies for identifying privilege and reducing barriers

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Outline

- Who we are
- About the S-STEM program
- What we did
- What we learned
- Broader impacts
- Questions
  - cover topics for our follow-up webinar on November 4th

Historical Data From Our Schools Illustrate the Problem

Average Persistence of Biology Majors		
	1st to 2nd year	1st to 3rd year
2011	50%	28%
2012	57%	33%
2013	53%	30%
2014	49%	
Average Graduation Rate		
	college-wide	students who would have qualified for SSB program
2011	28%	18.5%

National Science Foundation

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The main goal of the S-STEM program is to enable low-income, talented domestic students to pursue successful careers in promising STEM fields.

Institutional Collaboration to Recruit, Retain and Graduate Low-Income Students in Biology

Nancy Brubaker, Ferrum College
Anthony Canger and Renée Haskew-Layton, Mercy College
Joe Flaherty, Coker University
Anthony Santamaria, Saint Elizabeth University

Gloria Nemerowicz and Ann Landis
The Yes We Must Coalition (https://yeswemustcoalition.org/)

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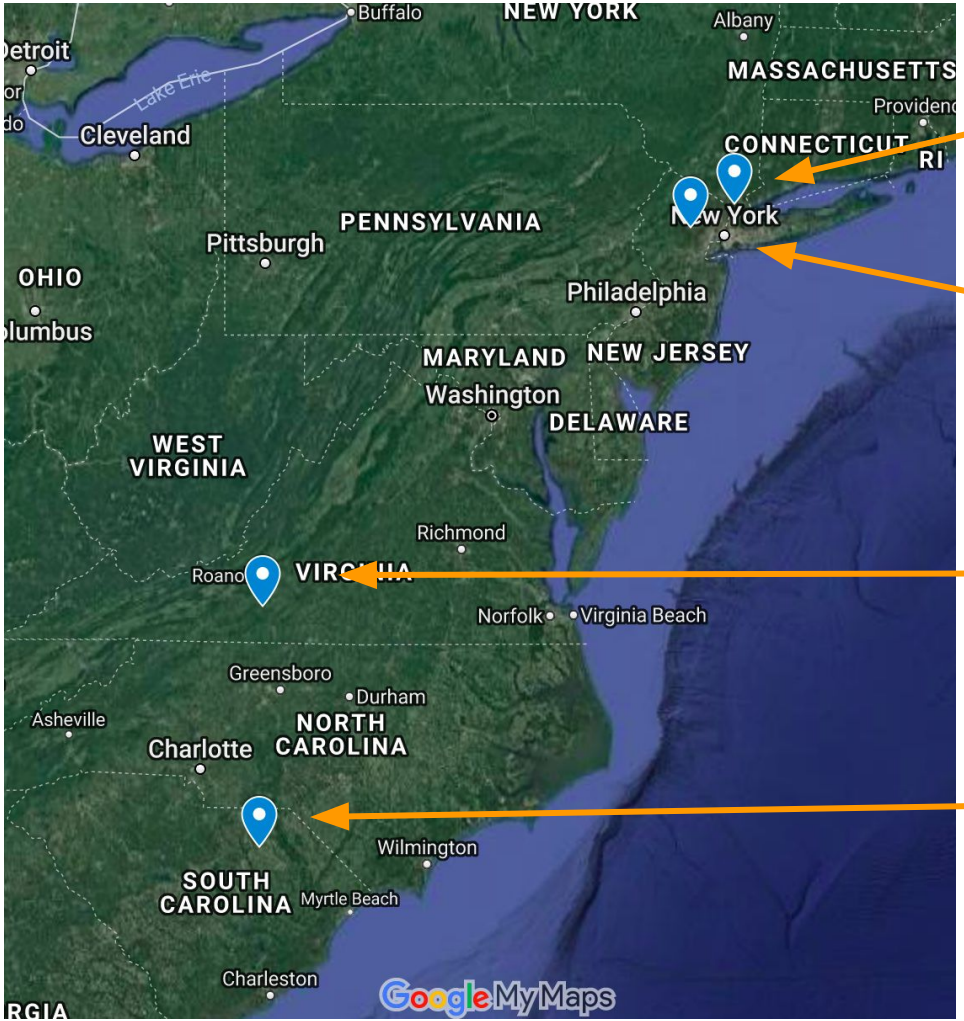


Mercy College (Dobbs Ferry, NY; Bronx, NY; Manhattan, NY)

St. Elizabeth Univ. (Morristown, NJ)

Ferrum College (Ferrum, VA)

Coker Univ. (Hartsville, SC)

1 of 30 Private Colleges & Universities-VA

1,124 Enrolled Students

95% Residential

25% First Gen (2021)

61% Pell

43% Racial-Ethnic Minorities

42% Women

Student Faculty Ratio 13:1

>48% Varsity Athletes

NCAA Division III Football

Old Dominion Athletic Conf.

11 men's teams

14 women's teams

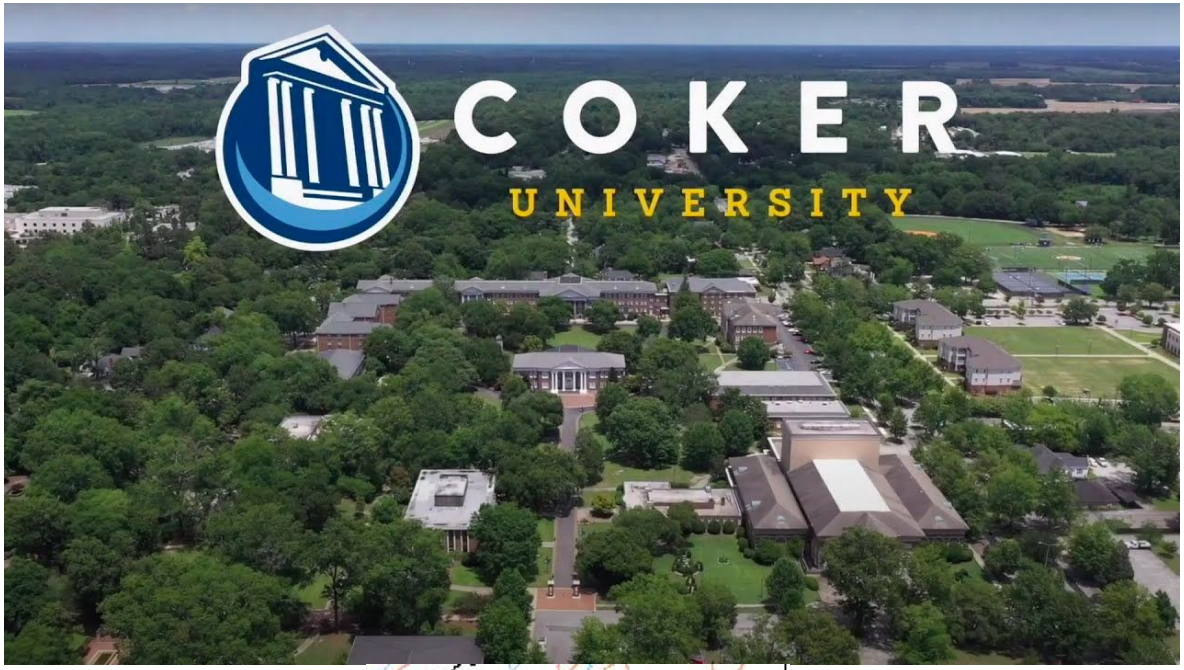
Ferrum College Notables

Began as Ferrum Institute for primary & secondary ED

Ferrum Junior College 1940 and 1976

Now offers over 54 undergraduate majors & 2 graduate programs

Listed in the National Register of Historic Places and the Virginia Landmarks Register.



Est. 1908

1 of 14 private univ. in SC (only unaffiliated)

~1,000 students (~700 residential)

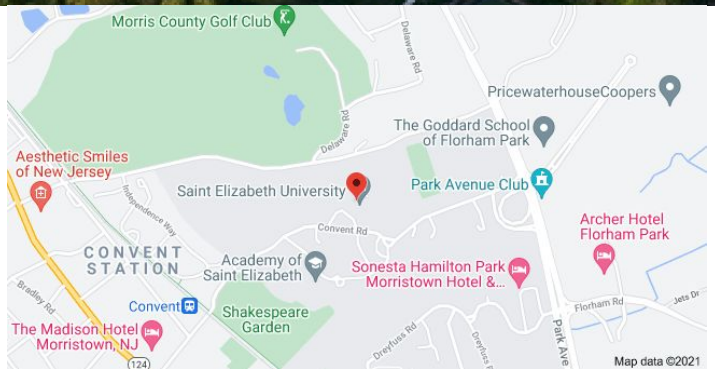
Avg. class size = 12

40% first gen
50% Pell
40% students of color

NCAA Div II (24 sports)
>60% of traditional students are athletes

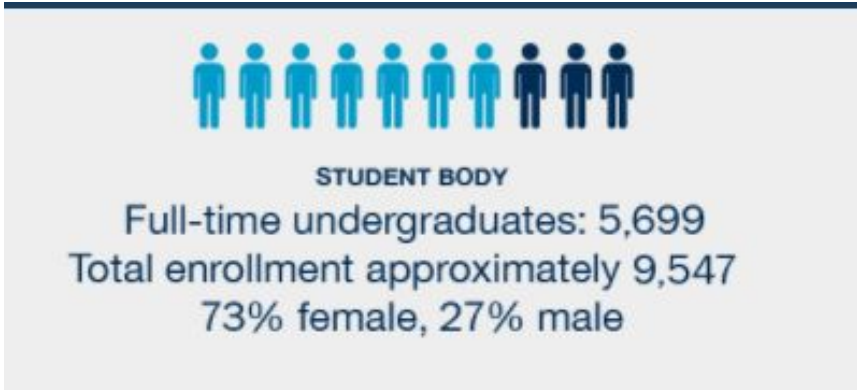
Saint Elizabeth University

MORRISTOWN, NJ



- Founded in 1899
- Approximately 1200 students, 60% residential, 69% Pell eligible, 45% first generation, and 67% students of color many of whom come from inner-city high schools
- Officially designated as a Minority Serving Institution and Hispanic Serving Institution
- Average class size: 11
- Athletic Affiliations: NCAA (Division III), Colonial States Athletic Conference (CSAC), North East Athletic Conference (NEAC)

MERCY COLLEGE



- Hispanic and Minority Serving Institute
- Primarily commuter students
- Campuses in suburban Westchester County and New York City (Bronx and Manhattan)

- 19% First Gen
- 49% Pell
- 67% Underrepresented Minority Students

A Multi-Institutional Collaboration

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COKER UNIVERSITY

MERCY COLLEGE

Saint Elizabeth University
MORRISTOWN, NJ

FERRUM COLLEGE

How we got started...

In late 2015, a working group of YWM Coalition Schools formed a submission to NSF S-STEM Track III with the goal to produce a
scalable model of institutional collaboration, particularly for under-resourced colleges.

Initial submission in 2017 resulted in positive and helpful reviews but was not recommended for funding. We submitted an improved proposal in the following year and this was selected for funding (project began in 2018).

Initial cohort (78 students) started as first-time undergraduate students in Fall 2018. A second cohort of 36 students began in Fall 2019.

STEM Scholars in Biology (SSB)

The program has successfully recruited 114 STEM Scholars in Biology (SSB) students at the respective institutions (18 each at Saint Elizabeth University and Ferrum College, 36 at Coker Univ., and 42 at Mercy College).

The annual scholarship award was based on closing the students' calculated financial gap and ranged from $2,0000 - $10,000 (average of $6,000).

Scholar Demographics (n = 114)

Female = 80%

Minority (all) = 60%

African American = 26%

Hispanic = 33%

Avg. Est. Financial Contribution (EFC) = $1,404

Identifying and fostering synergistic partnerships

- It’s easy to find the differences between programs and institutions but more difficult to identify common goals and desired outcomes.

- What are strategies or programmatic elements that appear to be working compared to those you would like to do well?

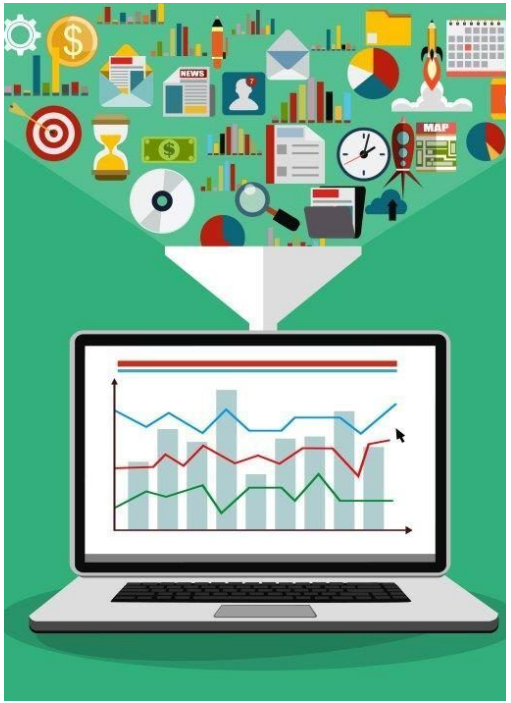
- Synergistic partnerships develop from the likelihood of sharing and adopting strategies to achieve common goals and desired outcomes.

Project Goals

- Support qualifying SSB students with S-STEM scholarship Awards to Form the Cohort of the Study.
- Increase Number of Low-Income Biology Students Enrolled in Our Programs
- Elevate the rates of persistence (in STEM majors), retention, and graduation for low-income students in biology.
- Close the Observed Gaps between SSB students & academically comparable biology students who do not have demonstrated financial need in the same cohort year.
    - In Undergraduate Success
    - GPA, self-identity, college skills, e.g
    - In job/graduate school placement

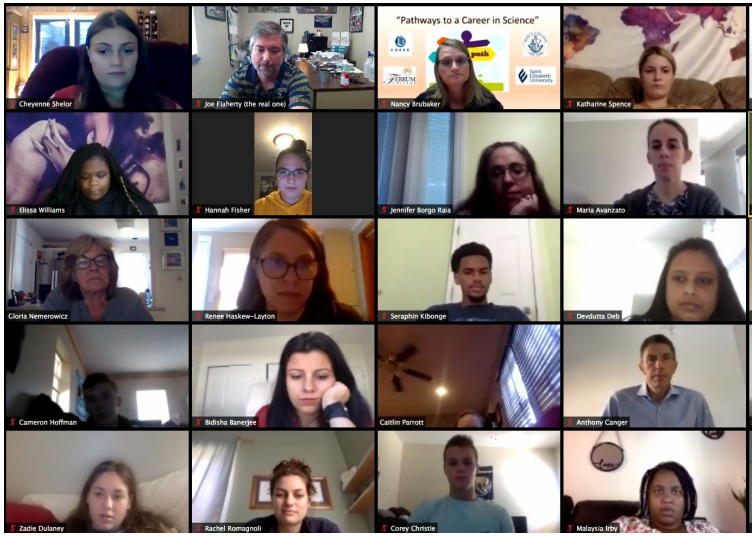
Data Collected

- Admissions/Recruitment: Total # of students who applied/accepted/enrolled & intend to major in Biology-related major (non-clinical)
- Student demographic information
- Estimated family contribution (EFC)
- Grades (entry level Math, gateway Science, FYE), credits earned, semester and cGPA
- Engagement in undergraduate research, internships
- Job/Graduate Placement



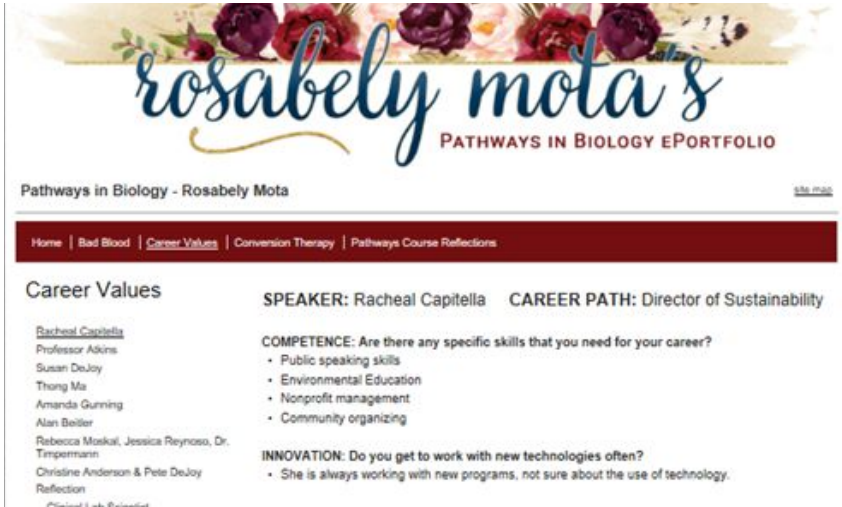
Collaboration across multiple institutions

- Biweekly zoom meetings (over the past 4 years)
  - PIs
  - Yes We Must Coalition
  - Institutional Assessment Team
  - External Evaluator
    - (Dr. John Miles, Reinhardt Univ.)
- Collaborate on survey tools and analysis



Assessment Tools

- End-of-year surveys (administered in spring of all years)
- COVID impact survey (administered in late spring 2020)
- Morehouse Instrument (science literacy and confidence)
- ePortfolios (specific prompts administered annually)
- Post-programming surveys administered (*e.g.*, institutes, workshops)



Example: Student ePortfolio

Program Activities

Build Sense of Belonging

Career Readiness

Guidance & Support

Scientific Literacy & Critical Thinking

- CATALYST, “Jumpstart” inspired program: team building at start of SSB program
- Integrated first-year experience including a STEM- based first-year seminar; cohort model for gateway biology courses
- Intrusive advising and faculty/peer mentors program
- Hands-on research/project based learning under faculty mentorship
- Graduate school/career preparation
- Faculty Development
- Annual institute to bring the cohort of students and faculty teams together

STEM Scholars: CATALYST Program Activities

Ferrum College: Analysis in the Organic Lab

Mercy College: Field work on the Hudson River

Research

- Expand opportunities for SSB scholars to participate in UG research
- Embedded as course-based UG research experience (CURE) or mentored research
- Scholars learn about each others research through SSB Research Symposium
- Gain confidence through presenting their own research and through lens of aspirational research projects from other students

Each STEM Scholar Received A High-Quality Laptop

College of Saint Elizabeth

Ferrum College

Mercy College

STEM Scholars in Biology ***Institute***

First (of three) annual 2-day meeting held in April, 2019 in Research Triangle Park, NC.

Activities included:

- Tour of BASF (two sites)
- Metacognition workshops (led by Dr. Amy Overman, Elon Univ.)
- Faculty/Scientists Roundtables with students
- Keynote address by Dr. Jessica Barron (the importance of diversity and inclusion in STEM)


BASF
We create chemistry
Plant Biotechnology at BASF
Microbiome Discovery Team
April 5th 2019

Virtual Institute

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2020–21 STEM Scholars in Biology (SSB) Calendar of Events
YWMC Member Graduate Programs and Admission Requirements Inventory

2020–21 STEM Scholars in Biology (SSB) Calendar of Events

The goal of the STEM Scholars in Biology Program is to increase the number of biology majors from diverse backgrounds who go on to contribute to the advancement of knowledge in a broad range of scientific endeavors, either by entering the workforce or a life science-related graduate program upon graduation. Four Yes We Must member schools are part of this five-year program partially supported by a grant from the National Science Foundation to provide the support, guidance and opportunities that students need to succeed. One hundred fourteen students and faculty are currently participating in the program from Coker University (SC), Ferrum College (VA), Mercy College (NY) and Saint Elizabeth University (NJ).

This will be a busy and informative year for the scholars.

April 16, 2021: STEM Scholars Research Symposium 3:30–5:00pm Eastern

3:30–3:35: Welcome Remarks
3:35–4:25: Student Breakout "Poster" Sessions

Virtual Institute

Welcome to 1st Annual SSB Research Symposium

STEM Scholars in Biology Research Symposium

COKER UNIVERSITY

FERRUM COLLEGE

Saint Elizabeth University
MORRISTOWN, NJ

MERCY COLLEGE

Friday April 16th, 2021 3:30 PM – 5 PM

- 3:30 PM – 3:35 PM – Welcome Remarks
- 3:35 PM – 4:25 PM – Student Breakout "Poster" Sessions
- 4:25 PM – 4:45 PM – Student Keynote Presentation:
  Do Native Plants Mitigate Pollinator Decline?
  Presented by: Bianca Jimenez, Mercy College
  Faculty Mentor: Dr. Margaret Eiden of Westchester Community College
- 4:45 PM – 5:00 PM – Awards and Closing Remarks

STEM Scholars in Biology (SSB) 2020 Virtual Institute
"Pathways to a Career in Science" Agenda

12 Noon (Eastern) – 12:30 pm: This is Us

12:35 – 1:35 pm: Dr. Kishana Taylor, "Journey to the Center of a Pandemic: From Dolphins to Viruses and More"

Dr. Kishana Taylor is a virologist and advocate for minoritized groups in STEM. Dr. Taylor received her bachelor's degree in Animal Science from the University of Delaware where she was named a Woman of Promise in addition to being an EPSCoR and Summer Institute Research Scholar. Dr. Taylor continued her education at The George Washington University, earning a master's degree in Public Health Microbiology and Emerging Infectious Diseases, where her work on the effects of concentrated poultry operations and cropland manure applications on antibiotic resistant E. Coli in Chesapeake Bay watersheds was supported by the Smithsonian Institute. Dr. Taylor went on to earn her Ph.D. from the University of Georgia in Interdisciplinary Biomedical Sciences in 2018. Her research focused on developing laboratory animal models of virus transmission for epizootic hemorrhagic disease virus. Dr. Taylor is currently a postdoctoral fellow at Carnegie Mellon University in the lab of Dr. Elizabeth Wayne. Her current NSF-funded research focuses on the role of monocytes and macrophages in SARS-CoV2 infection and subsequent development of COVID-19. Dr. Taylor's research interests include arboviruses, zoonotic viruses and their epidemiology, ecology and evolution. Dr. Taylor also serves as a counselor for virology trainees with the American Society for Virology and has served in several other leadership positions during her time in higher education.

The New York Times

Black Microbiologists Push for Visibility Amid a Pandemic

A week of talks, panels and discussions seeks to counter an impression "that this talent pool just does not exist."

93.6% of scholars responded either “somewhat agree” or “totally agree” to the query: *The presentation (by Dr. Kishana Taylor) helped me see the different pathways to becoming a scientist.*

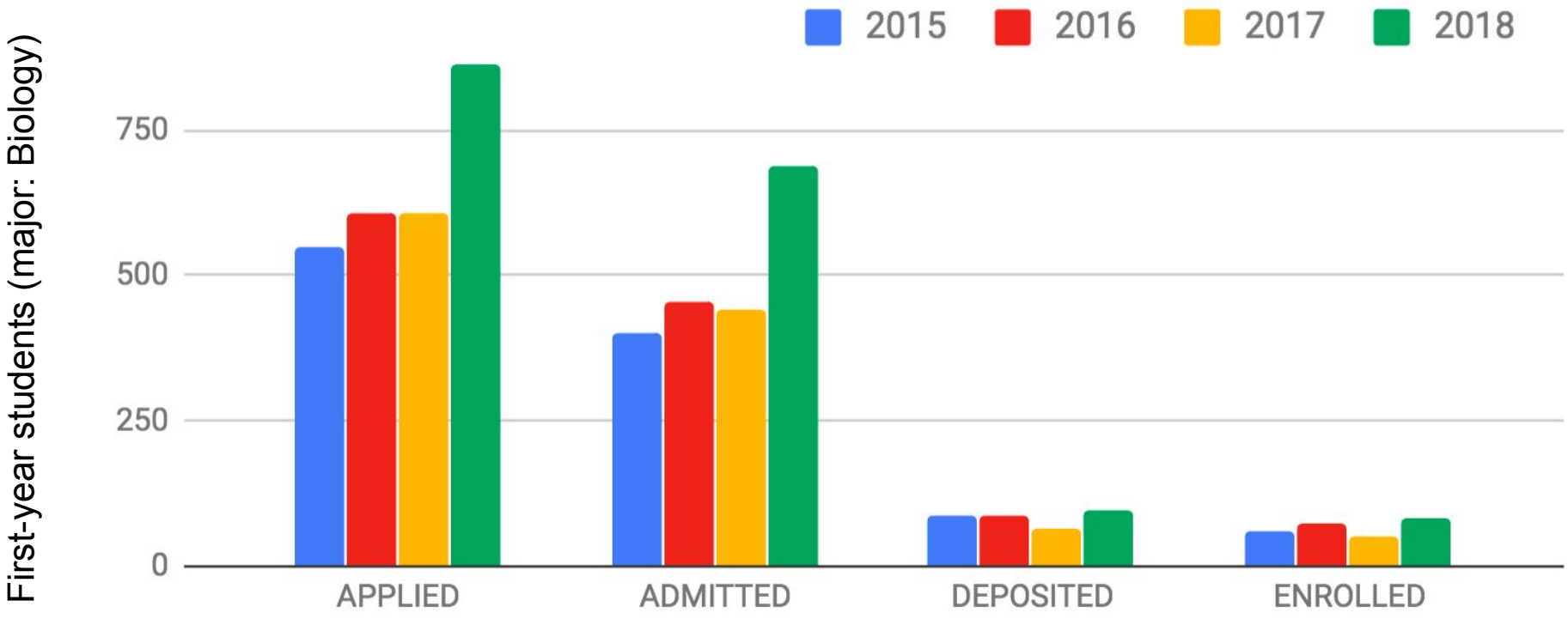
The students also responded positively in regards to the presentation increasing their:

- *confidence in becoming a scientist* (45.2% responded “totally agree”),
- *broadening their awareness of possible careers in science* (59.7% responded “totally agree”),
- *feeling they are a part of a community of aspiring scientists* (54.8% responded “totally agree”).

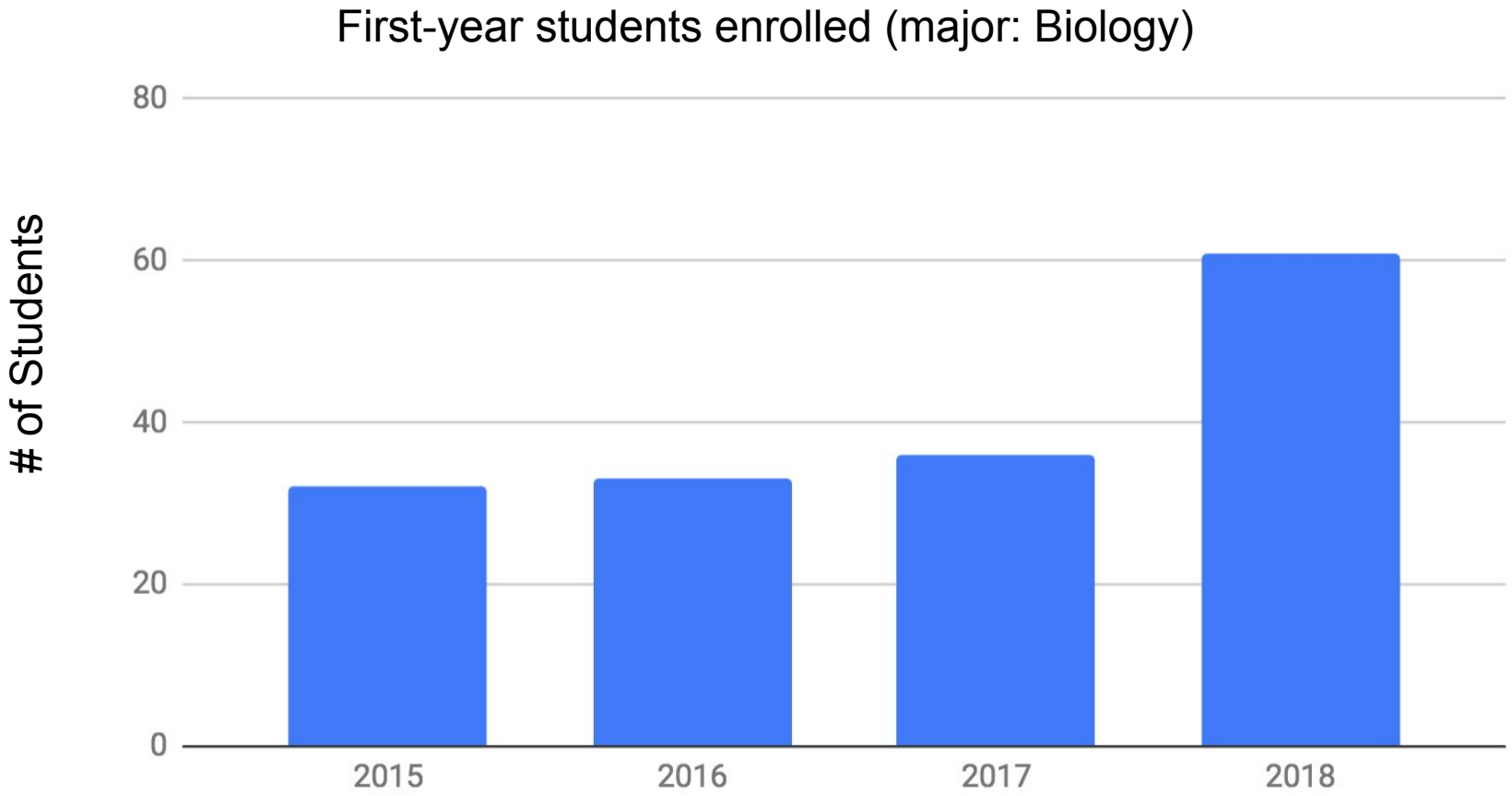
Impact on Enrollment

Will the implementation of the SSB program at each collaborating institution increase the overall numbers of academically talented, low-income entering freshman who enroll in STEM biology (or STEM overall)?

Impact on Admissions - Ferrum (as an example)



Impact on Admissions - Coker (as an example)



Impact on Student Success

Persistence
Year 1 to Year 3 (cohort 1, n=99)

	SSB	Control (Pell)	Control (Affluent)
Persistence rate (range)	75% (67-80%)	42% (18-55%)	31% (8-50%)

Persistence rate = number of students remaining in a STEM major at the beginning of 2021 divided by the number enrolled in the biology major at the start of Fall 2018 (cohort 1 shown)

Impact on Student Success (SEU example)

Retention (remain at SEU)

Year 1 to Year 4

Retention	SSB	Control (Pell)	Control (Affluent)
# in cohort (n=)	18	9	4
Registered for FA21 at SEU	14*	5	2
Retention rate	**78%**	**55%**	**50%**

*These same 14 students were retained through the main period of the pandemic, whereas the retention rates for the affluent control group decreased.

Results of **COVID impact survey** administered at end of Spring 2020:

- **65.7%** of students reported having employment during the semester beyond a federal work-study position.
  - Of those, **77.8%** reported working more than 10 hours per week on average.
- **66.7%** reported taking on increased responsibilities at home due to the COVID-19 pandemic such as sibling care or elder care.
- **6.7%** reported not having access to broadband internet while at home.
- **72.4%** indicated that it would be a hardship to complete the spring semester online without their SSB laptop device.

Broader Impacts

- The collaborative S-STEM, especially given its partnership with YWMC, will result in a validated set of comprehensive best practices that will facilitate STEM success for students, especially those underrepresented in STEM and from low-income backgrounds.

- The success of this S-STEM program, increasing enrollment in Biology, lays a strong groundwork for future collaborations between IHEs and the YWMC.

Acknowledgements

In memory of **Nia Lane Chester**, PhD; without her tireless efforts and intellectual contributions, our project would not have been possible.

Questions and Thank you!

If you have any questions or thoughts to share in advance of our follow-up webinar event held on Thursday, Nov. 4th at 4:00 pm, please contact Ann Landis (YWMC)