

NPRLG Common Assessment

2021 Workshop - History, Update, Next Steps





History

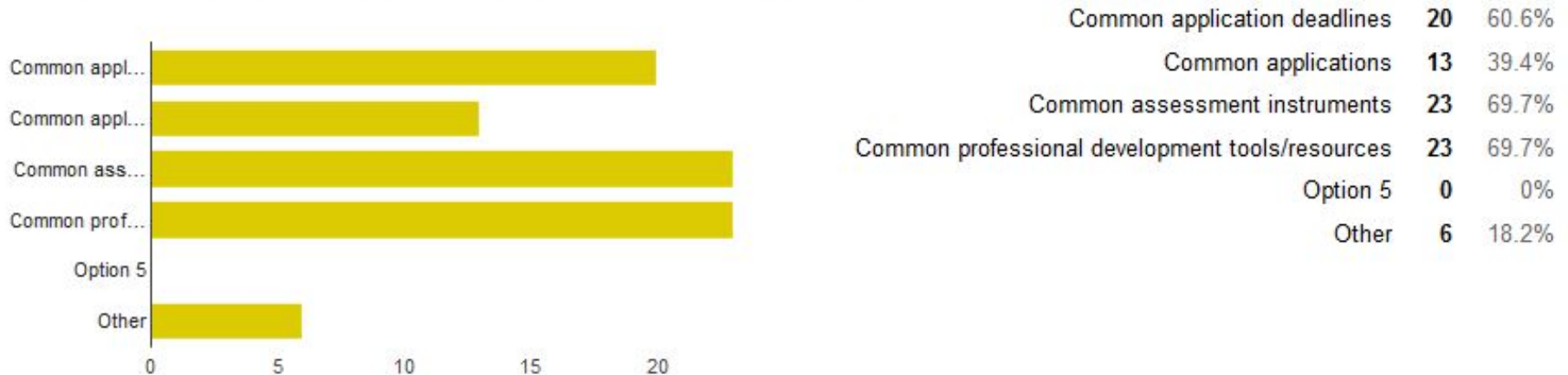




History - 2016 - In-person workshop

Pre-workshop survey

Check ideas of interest to you, and please add others ideas you may have to this list.





History - 2016 - In-person workshop

- Session on (common) assessment practices + Discussions
- Workshop outcomes:
 - Agreed motivation to do common assessment:
 - Reduce administrative load on site organizers
 - Provide NSF collective data about REU site impact on students
 - Committee to explore common assessment tools and platforms



History - 2017 - Subcommittee work

Explored



Tool (questions):

Researched available surveys and gathered NPRLG input



Platform (online portal):

Researched existing options and possibility of building one



Tool - URSSA

 University of Colorado **Boulder**



Ethnography & Evaluation Research

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Evaluation Tools: Undergraduate Research Student Self-Assessment (URSSA)

URSSA is an online survey instrument for use in evaluating student outcomes of undergraduate research experiences in the sciences. The URSSA survey items have been thoroughly tested and URSSA is now available for returning and new users!

» To learn more about URSSA, [read the FAQs](#).



Undergraduate Research

Evaluation Tools: Undergraduate Research Student Self-Assessment (URSSA)

URSSA FAQs

Outcomes of Undergraduate Research Programs

Undergraduate Research Programs to Enhance STEM Diversity



Platform - CIMER

Center for the Improvement of
Mentored Experiences in Research



My User Profile

My Surveys ▾

My Curricula

Training Curricula

Log Out

> Customize Survey Invitation Email Text

☰ Section 1 - Base



Research Participant Information and Consent Form

☰ Section 2 - Base



Thinking and Working Like a Scientist

Q1

How much did you GAIN in the following areas as a result of your most recent research experience?

	no gains	a little gain	moderate gain	good gain	great gain	not applicable
2.1 Analyzing data for patterns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.2 Figuring out the next step in a research project	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON



History - 2018 - Trial run

- 12 REU sites
- URSSA questions (post-program Mentees and Mentors)
- CIMER platform

Generally positive experience with CIMER and URSSA, but substantial technical issues

Feedback provided to CIMER



History - 2019/2020 - Implementation

2019:

- Gap year (no funding obtained)

2020:

- APS grant proposal to NSF obtained (in-person workshop + CIMER use)
- Funding for all NPRLG sites that opt in, all three years of the grant
- Switched first CIMER run to 2021 due to reduced programs (COVID)



2021 - First URSSA/CIMER run

31 sites signed up

Pre-program survey:

Demographics (+ Custom questions for each site)

Mentees (n=77) and Mentors (n=26)

Post-program survey:

Demographics + URSSA questions (+ Custom questions for each site)

Mentees (n=184) and Mentors (n=71)

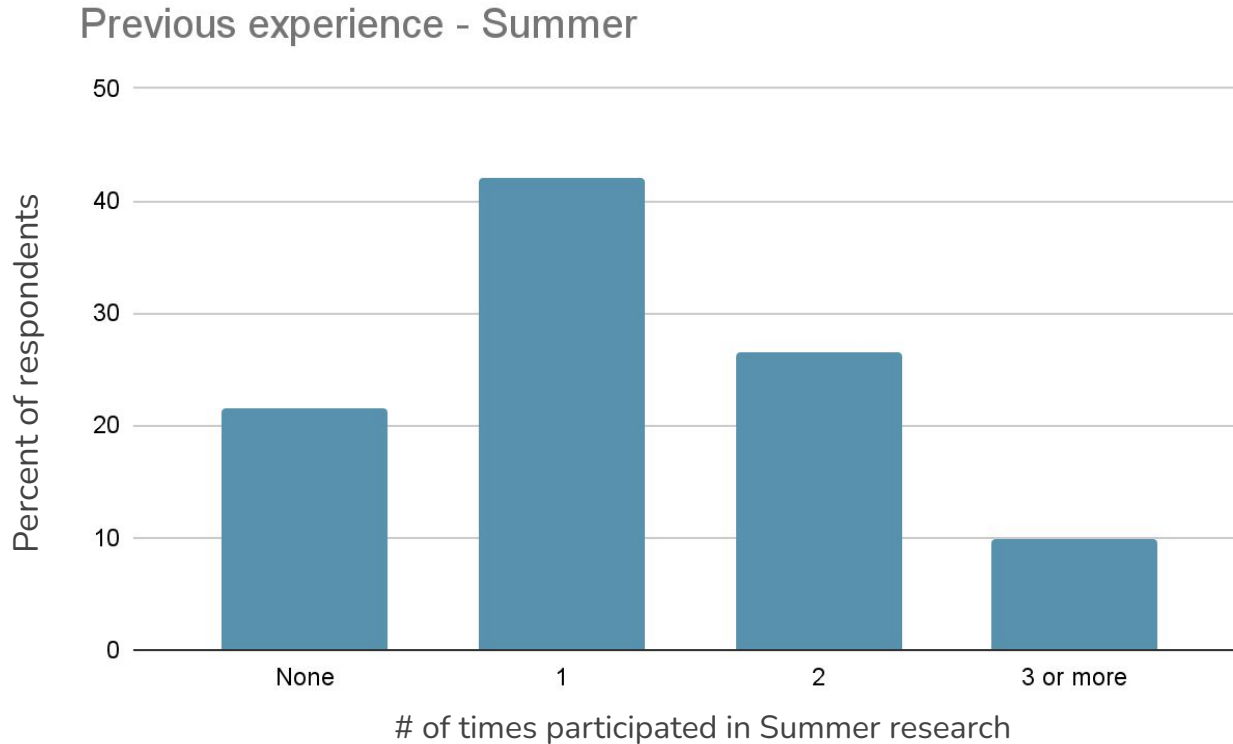


2021 Results





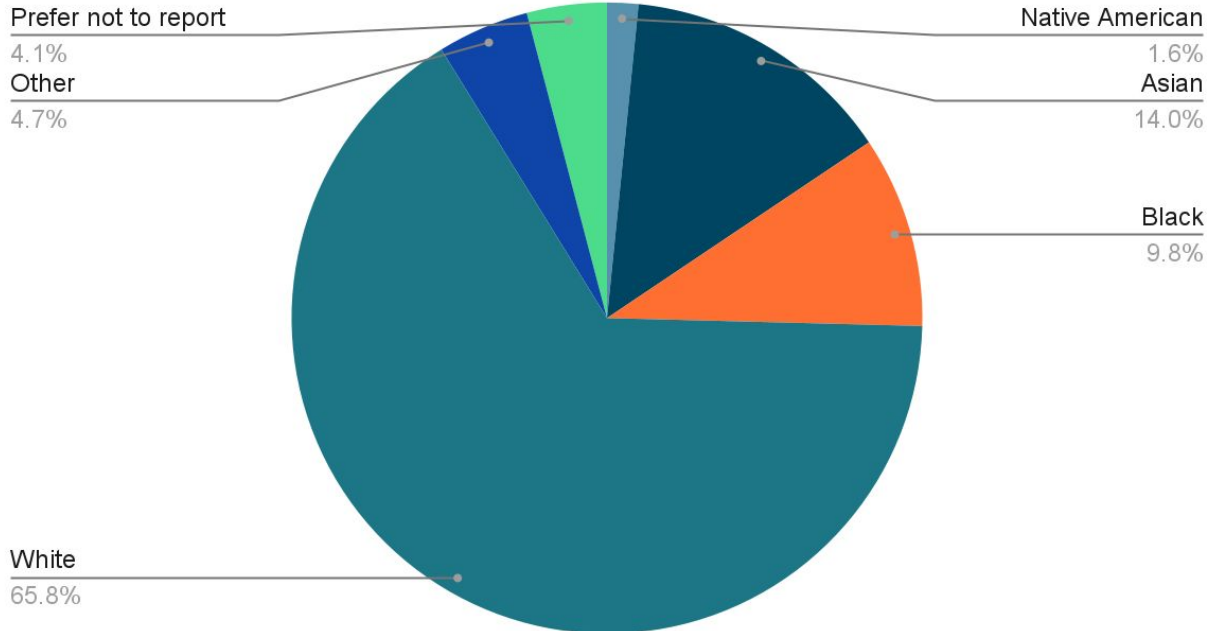
Post-program survey - Mentees





Post-program survey - Mentees

Race



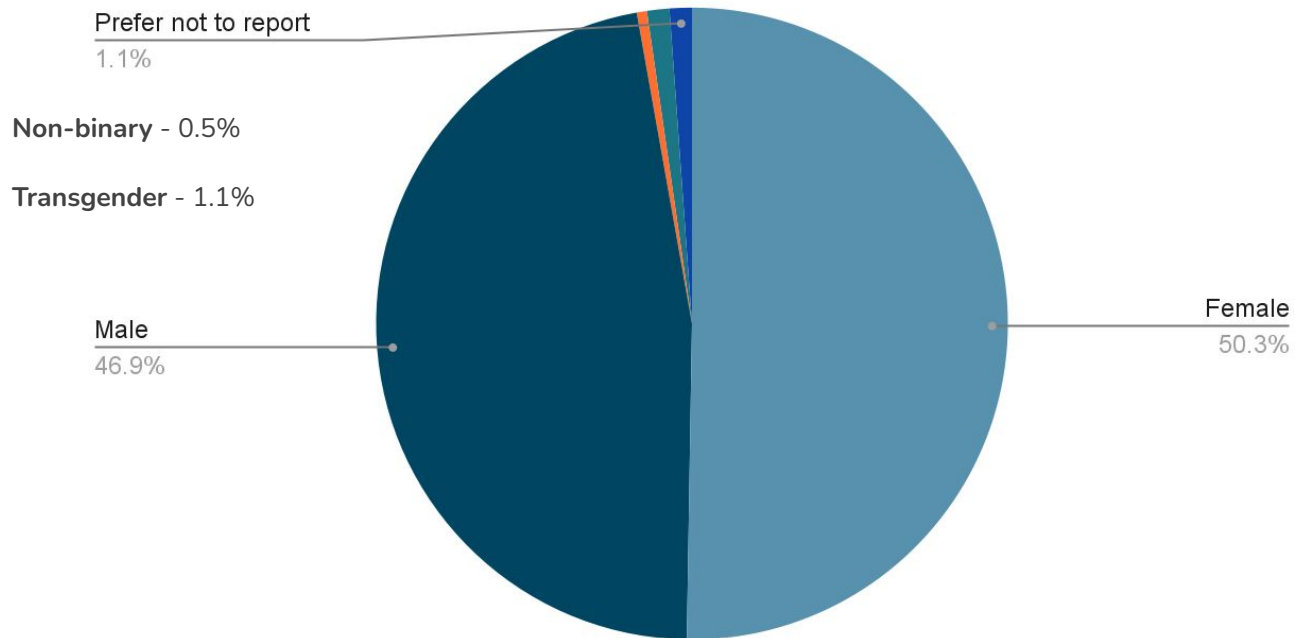
20.9%
Hispanic/Latino

77.4%
Not Hispanic/Latino

1.7%
Prefer not to report

Post-program survey - Mentees

Sex/Gender





Post-program survey - Mentees

Survey sections

1. Thinking and Working Like a Scientist
2. Personal Gains Related to Research Work
3. Skills
4. Attitudes and Behaviors Towards Research
5. Satisfaction

Overall positive outcomes in 5 categories, with some nuances



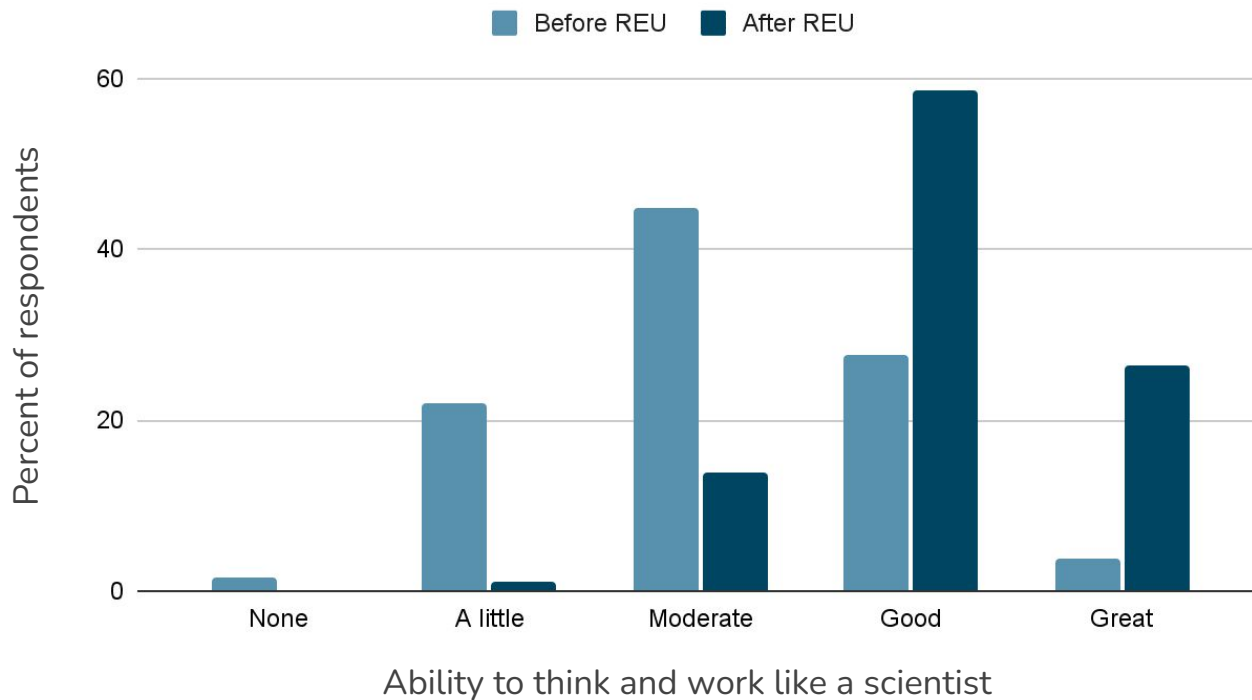
Post-program survey - Mentees

Thinking and Working Like a Scientist



Post-program survey - Mentees

Thinking and Working Like a Scientist





Post-program survey - Mentees

Thinking and Working Like a Scientist

2. How much did you GAIN in the following areas as a result of your most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
2.1. Analyzing data for patterns	2.8%	9.9%	16.0%	24.9%	43.1%	3.3%	4.1	181
2.2. Figuring out the next step in a research project	0.0%	7.2%	12.2%	35.4%	44.2%	1.1%	4.2	181
2.3. Problem solving in general	0.6%	6.6%	11.6%	31.5%	48.1%	1.7%	4.2	181
2.4. Formulating a research question that could be answered with data	3.9%	9.9%	22.7%	33.1%	25.4%	5.0%	3.8	181

Similar for the 4 other items not shown



Post-program survey - Mentees

Thinking and Working Like a Scientist

2. How much did you GAIN in the following areas as a result of your most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
2.1. Analyzing data for patterns	2.8%	9.9%	16.0%	24.9%	43.1%	3.3%	4.1	181
2.2. Figuring out the next step in a research project	0.0%	7.2%	12.2%	35.4%	44.2%	1.1%	4.2	181
2.3. Problem solving in general	0.6%	6.6%	11.6%	31.5%	48.1%	1.7%	4.2	181
2.4. Formulating a research question that could be answered with data	3.9%	9.9%	22.7%	33.1%	25.4%	5.0%	3.8	181

Similar for the 4 other items not shown



Post-program survey - Mentees

Personal Gains Related to Research Work

Rate your overall mindset towards research (Before REU and After REU)

Not favorable

A little favorable

Moderately favorable

Favorable

Greatly favorable

Skills

Rate your overall research skills (Before REU and After REU)

None

A little

Moderate

Good

Great

Attitudes and behaviors as a researcher

Rate our attitudes and behaviors towards research (Before REU and After REU)

Very negative

Negative

Neutral

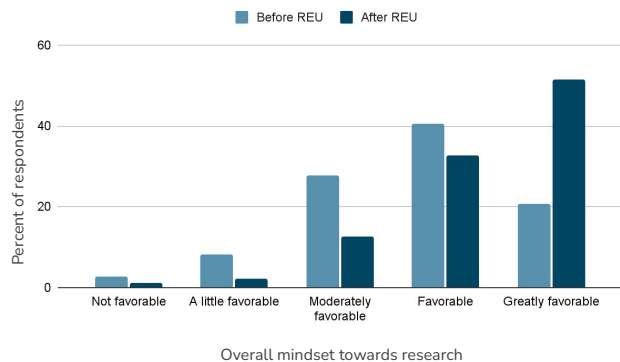
Positive

Very positive

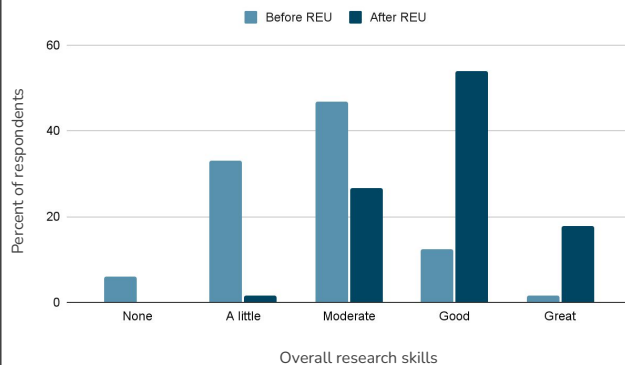


Post-program survey - Mentees

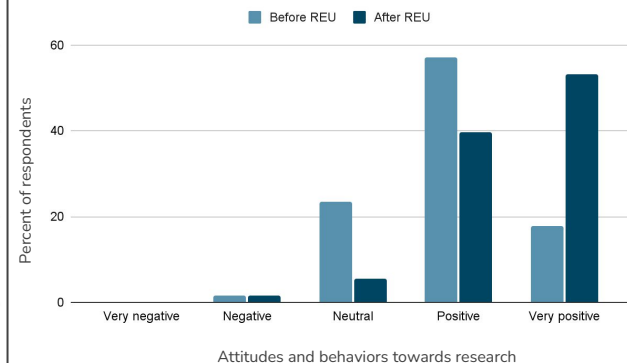
Personal Gains Related to Research Work



Skills



Attitudes and Behaviors as a Researcher



■ Before REU ■ After REU



Post-program survey - Mentees

Personal Gains Related to Research Work

5. How much did you GAIN in the following areas as a result of your most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
5.1. Confidence in my ability to do research	1.7%	7.8%	10.0%	27.2%	53.3%	0.0%	4.2	180
5.2. Confidence in my ability to contribute to science	0.6%	10.0%	13.3%	24.4%	51.7%	0.0%	4.2	180
5.3. Comfort in discussing scientific concepts with others	1.1%	6.1%	13.9%	36.1%	42.8%	0.0%	4.1	180
5.4. Comfort in working collaboratively with others	3.3%	6.7%	20.0%	28.3%	38.9%	2.8%	4.0	180

Similar for the 5 other items not shown



Post-program survey - Mentees

Skills

8. How much did you GAIN in the following areas as a result of your most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
8.1. Writing scientific reports or papers	5.6%	15.7%	15.2%	34.8%	20.2%	8.4%	3.7	178
8.2. Making oral presentations	1.1%	9.0%	18.0%	29.8%	41.6%	0.6%	4.0	178
8.3. Defending an argument when asked questions	3.9%	16.9%	27.5%	30.9%	18.0%	2.8%	3.5	178
8.4. Explaining my project to people outside my field	1.1%	6.8%	15.3%	31.6%	44.6%	0.6%	4.1	177
8.5. Preparing a scientific poster	12.9%	7.3%	9.0%	10.7%	34.3%	25.8%	4.2	178

Similar for the 8 other items not shown



Post-program survey - Mentees

Skills

8. How much did you GAIN in the following areas as a result of your most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
8.1. Writing scientific reports or papers	5.6%	15.7%	15.2%	34.8%	20.2%	8.4%	3.7	178
8.2. Making oral presentations	1.1%	9.0%	18.0%	29.8%	41.6%	0.6%	4.0	178
8.3. Defending an argument when asked questions	3.9%	16.9%	27.5%	30.9%	18.0%	2.8%	3.5	178
8.4. Explaining my project to people outside my field	1.1%	6.8%	15.3%	31.6%	44.6%	0.6%	4.1	177
8.5. Preparing a scientific poster	12.9%	7.3%	9.0%	10.7%	34.3%	25.8%	4.2	178

Similar for the 8 other items not shown



Post-program survey - Mentees

Attitudes and Behaviors as a Researcher

11. During your research experiences HOW MUCH did you:

	1: none	2: a little	3: some	4: a fair amount	5: a great deal	6: not applicable	Mean	N
11.1. Engage in real-world science research	0.6%	5.6%	8.9%	26.3%	58.1%	0.6%	4.4	179
11.2. Feel like a scientist	4.5%	7.8%	11.2%	33.5%	41.9%	1.1%	4.0	179
11.3. Think creatively about the project	2.8%	5.1%	24.7%	27.0%	40.4%	0.0%	4.0	178
11.4. Try out new ideas or procedures on your own	4.5%	14.0%	15.6%	27.4%	37.4%	1.1%	3.8	179
11.5. Feel responsible for the project	2.2%	5.0%	12.8%	27.9%	50.8%	1.1%	4.2	179

Similar for the 3 other items not shown



Post-program survey - Mentees

Satisfaction

14. Please rate the following:

	1: poor	2: fair	3: good	4: excellent	Mean	N
14.1. My working relationship with my research mentor	1.8%	2.4%	31.9%	63.9%	3.6	166
14.2. My working relationship with research group members	1.2%	7.2%	36.7%	54.8%	3.5	166
14.3. The amount of time I spent doing meaningful research	1.8%	12.1%	47.3%	38.8%	3.2	165
14.4. The amount of time I spent with my research mentor	6.6%	15.7%	41.0%	36.7%	3.1	166

Similar for the 3 other items not shown



Post-program survey - Mentees

Satisfaction

14. Please rate the following:

	1: poor	2: fair	3: good	4: excellent	Mean	N
14.1. My working relationship with my research mentor	1.8%	2.4%	31.9%	63.9%	3.6	166
14.2. My working relationship with research group members	1.2%	7.2%	36.7%	54.8%	3.5	166
14.3. The amount of time I spent doing meaningful research	1.8%	12.1%	47.3%	38.8%	3.2	165
14.4. The amount of time I spent with my research mentor	6.6%	15.7%	41.0%	36.7%	3.1	166

Similar for the 3 other items not shown



Post-program survey - Mentees

Research Communication (Products)

15. As part of my most recent research experience:

	1: Yes	2: No	Mean	N
15.1. I presented a talk or poster to other students or faculty	95.0%	5.0%	1.0	181
15.2. I presented a talk or poster at a professional conference	15.0%	85.0%	1.9	180
15.3. I attended a conference	26.5%	73.5%	1.7	181
15.4. I wrote or co-wrote a paper that was published in an academic journal	5.0%	95.0%	2.0	180
15.5. I wrote or co-wrote a paper that was published in an undergraduate research journal	6.6%	93.4%	1.9	181

5 other items not shown (which refer to the ones above, but after summer)



Post-program survey - Mentees

Career Outlook

16. Rate how much you agree with the following statements.

	1: strongly disagree	2: disagree	3: agree	4: strongly agree	Mean	N
16.1. Doing my research confirmed my interest in my field of study	1.1%	8.9%	48.9%	41.1%	3.3	180
16.2. Doing research clarified for me which field of study I want to pursue	1.1%	12.4%	53.4%	33.1%	3.2	178
16.3. My research experience has prepared me for graduate school	0.6%	5.6%	44.4%	49.4%	3.4	178
16.4. My research experience has prepared me for a job	0.6%	9.4%	62.8%	27.2%	3.2	180



Post-program survey - Mentors

Previous Experience

	1: none	2: 1	3: 2	4: 3	5: 4	6: 5	7: 6-8	8: 9- 10	9: 11- 15	10: 16 - 20	11: 21 or more	Mean	N
15. How many undergraduate mentees have you preciously mentored?	4.3%	2.9%	7.1%	0.0%	2.9%	2.9%	20.0%	5.7%	12.9%	5.7%	35.7%	8.1	70



Post-program survey - Mentors

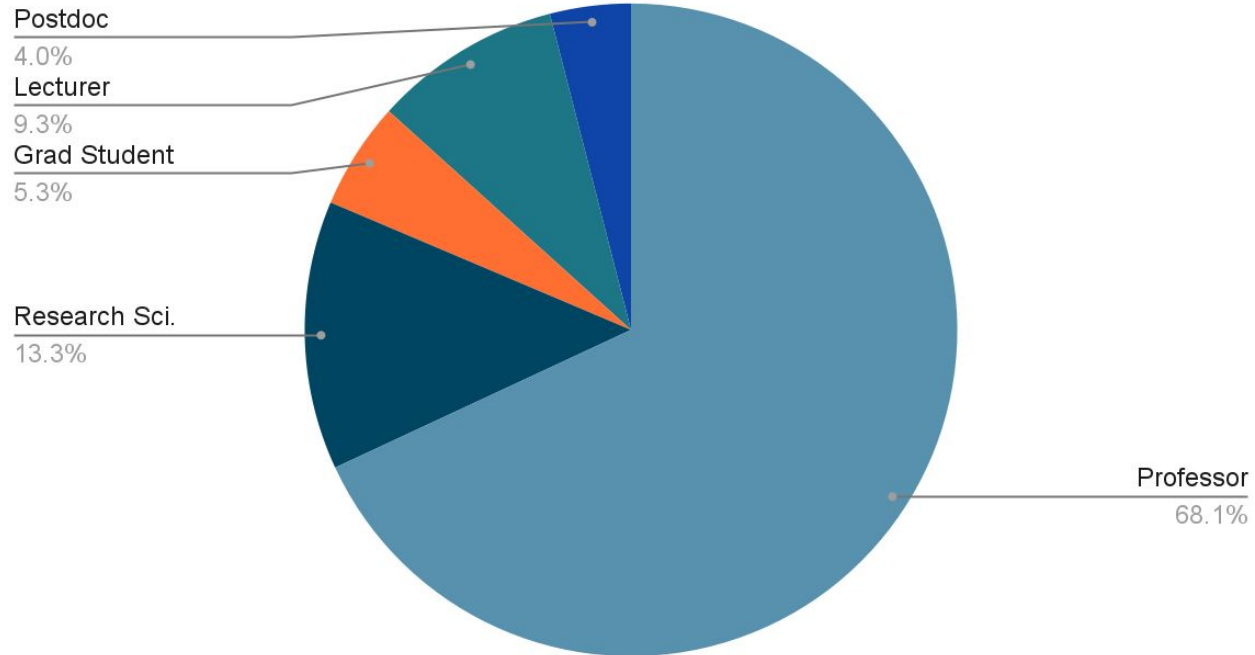
Previous Experience - Mentor Training

	1: Yes	2: No	Mean	N
18. Have you ever participated in any formal research mentor training?	31.0%	69.0%	1.7	71



Post-program survey - Mentors

Position





Post-program survey - Mentors

Race

Prefer not to report

9.2%

Other

6.6%

White

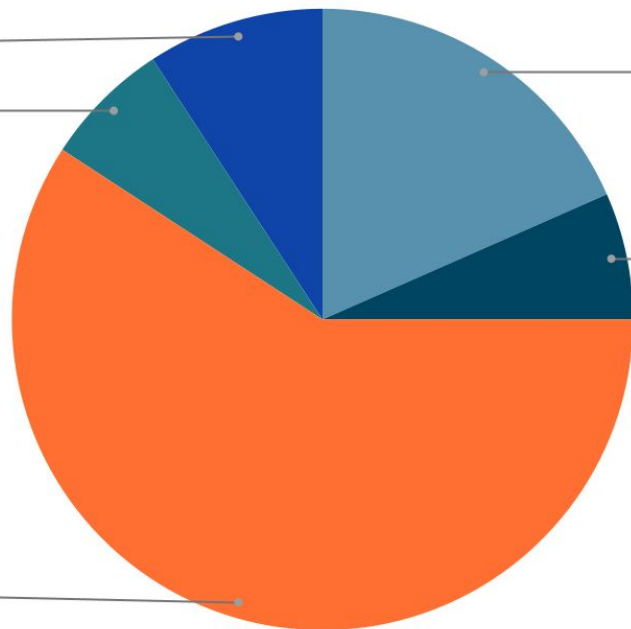
59.2%

Asian

18.4%

Black

6.6%



10.3%

Hispanic/Latino

82.4%

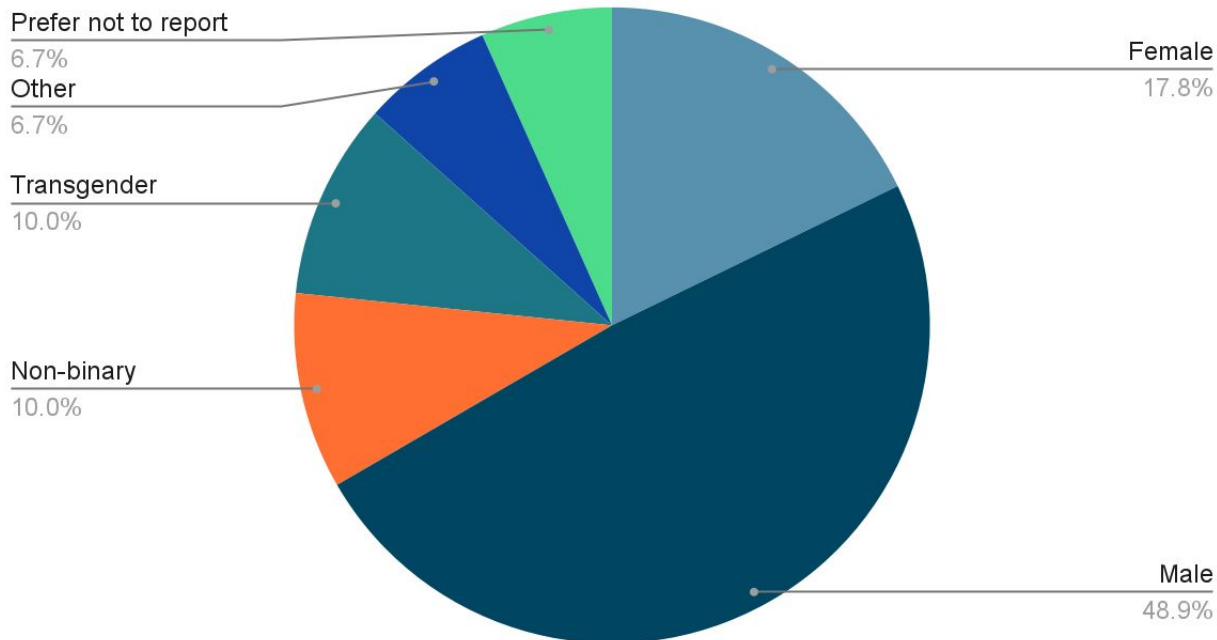
Not Hispanic/Latino

7.4%

Prefer not to report

Post-program survey - Mentors

Sex/Gender





Post-program survey - Mentees

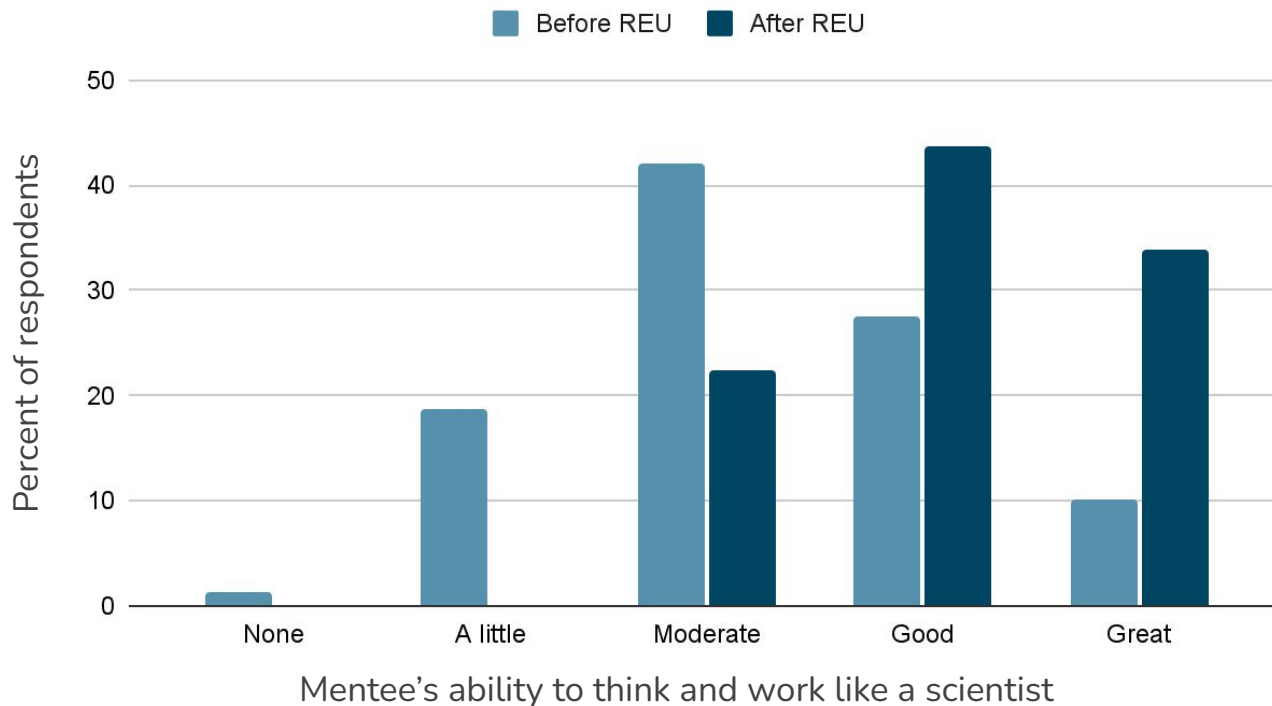
1. Thinking and Working Like a Scientist
2. Personal Gains Related to Research Work
3. Skills
4. Attitudes and Behaviors Towards Research
5. Satisfaction

Similar outcomes that align with Mentee results for all 5 categories



Post-program survey - Mentors

Thinking and Working Like a Scientist





Post-program survey - Mentors

Thinking and Working Like a Scientist

2. How much did your mentee GAIN in the following areas as a result of his or her most recent research experience?

	1: no gains	2: a little gain	3: moderate gain	4: good gain	5: great gain	6: not applicable	Mean	N
2.1. Analyzing data for patterns	1.5%	9.0%	11.9%	32.8%	40.3%	4.5%	4.1	67
2.2. Figuring out the next step in a research project	0.0%	6.0%	14.9%	38.8%	40.3%	0.0%	4.1	67
2.3. Problem solving in general	0.0%	6.0%	13.4%	35.8%	43.3%	1.5%	4.2	67
2.4. Formulating a research question that could be answered with data	3.0%	7.5%	29.9%	28.4%	26.9%	4.5%	3.8	67

Similar for the 4 other items not shown

Next Steps





Next steps



CIMER

- + Platform for data collection across programs
- + Customizable surveys
- + Tech support; open to feedback
- \$ (sustainability)

URSSA

- + Validated questions
- + Funded by NSF to fit NSF's reporting interests
- Not Physics-specific
- Results hard to translate to action



Next steps

1. Send results to NSF Program Officer (initial goal of this initiative)
2. Collective analysis of 2021 results?
 - a. gain insight and develop program recommendations
 - b. assess value of URSSA questions, need to update/enhance them?
3. Develop common questions in addition to URSSA that are more Physics-relevant and/or give more pragmatic feedback for program improvement?
4. Use Common Assessment as a launching point for research study on Physics REU impact?
5. Transition efforts to longitudinal impact assessment?



Next steps

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Discussion

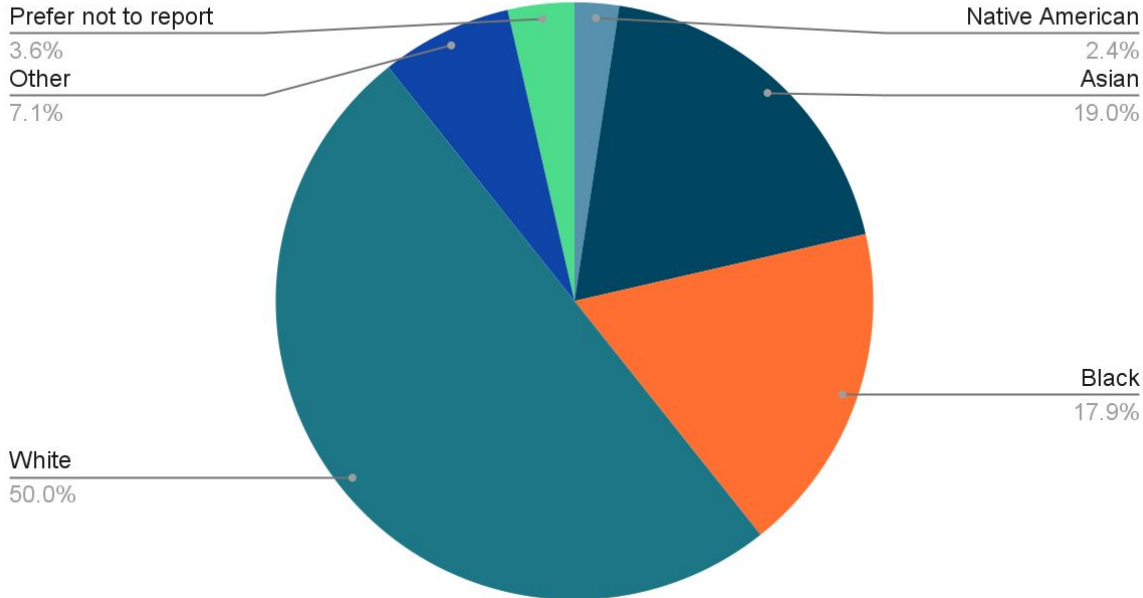


Extra slides below



Pre-program survey - Mentees

Race



23.7%

Hispanic/Latino

75%

Not Hispanic/Latino

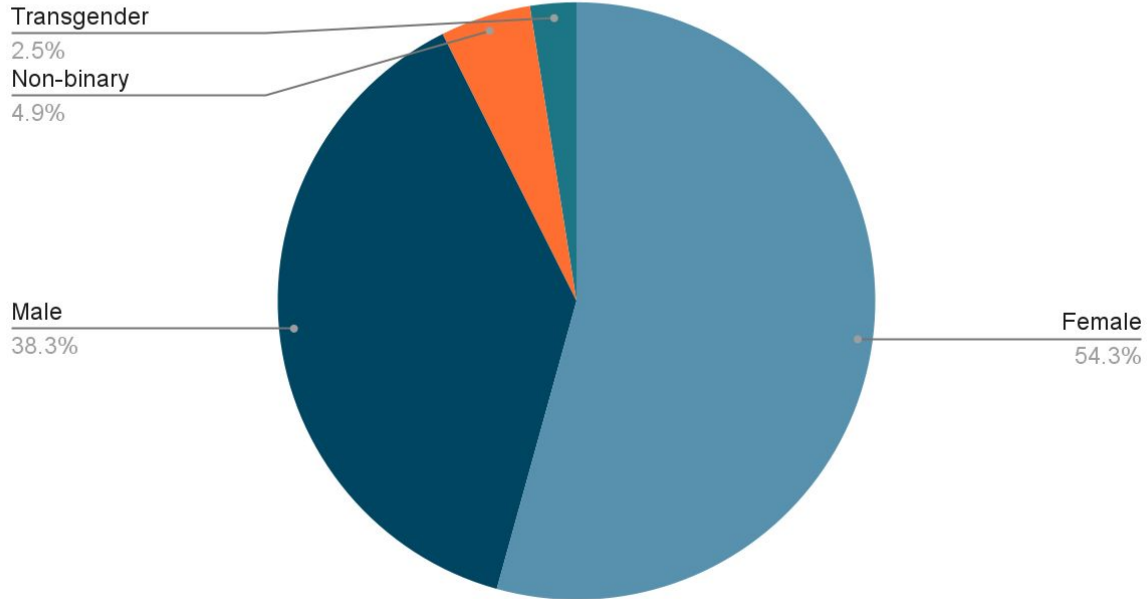
1.3%

Prefer not to report



Pre-program survey - Mentees

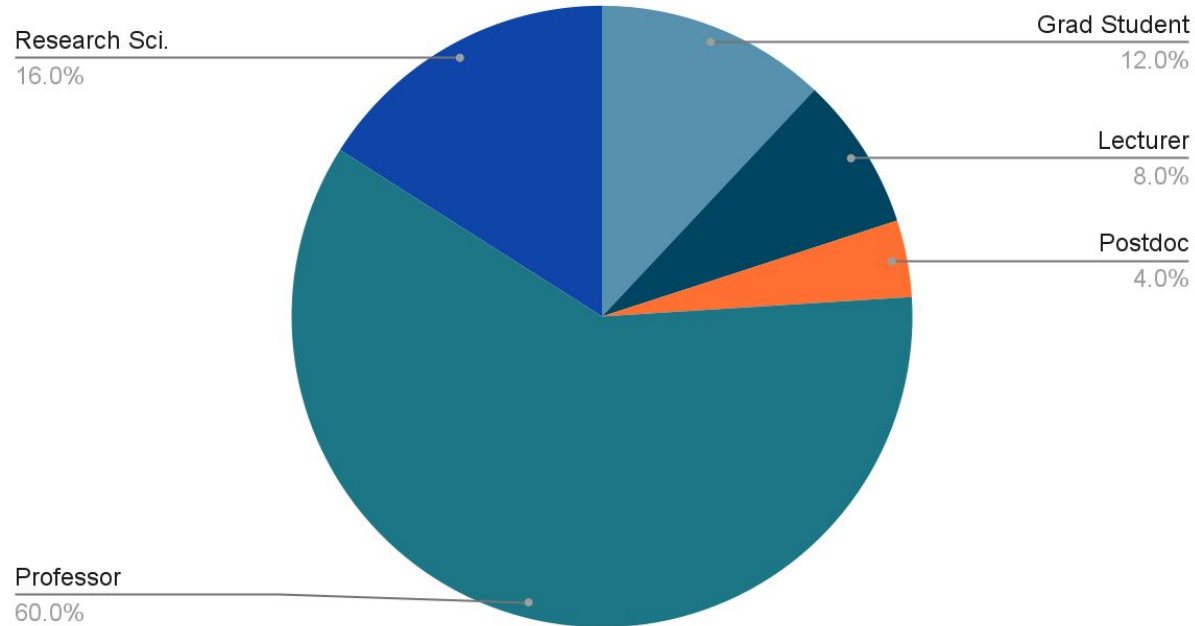
Sex/Gender





Pre-program survey - Mentors

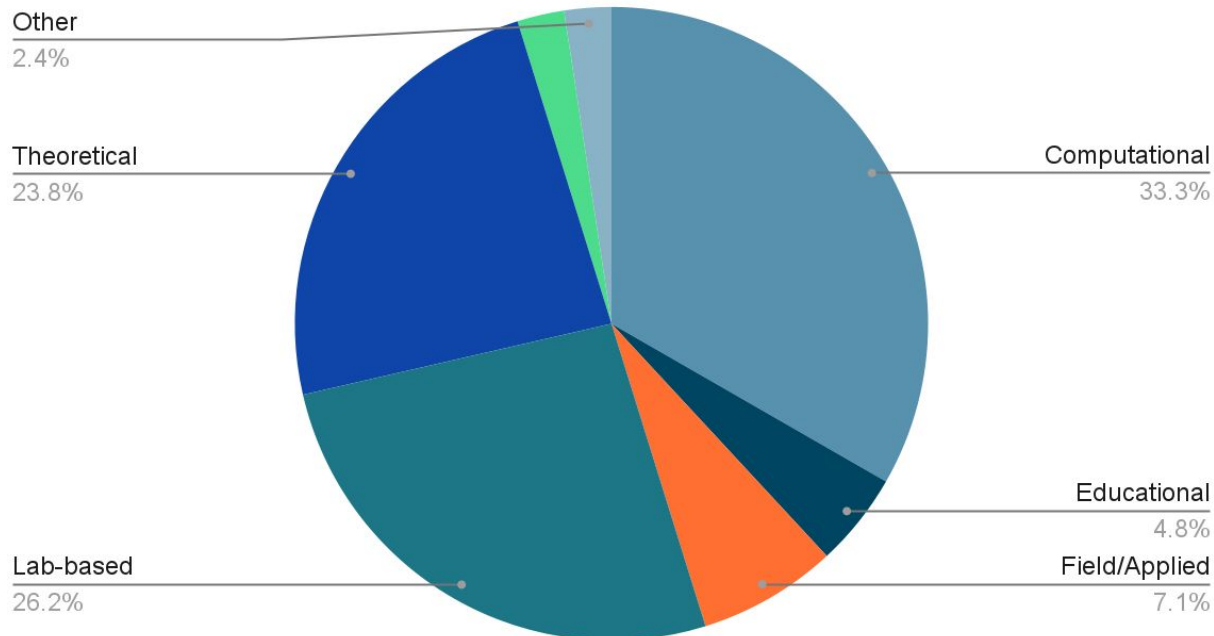
Position





Pre-program survey - Mentors

Research Focus





Pre-program survey - Mentors

Race

Prefer not to report

11.1%

Other

7.4%

White

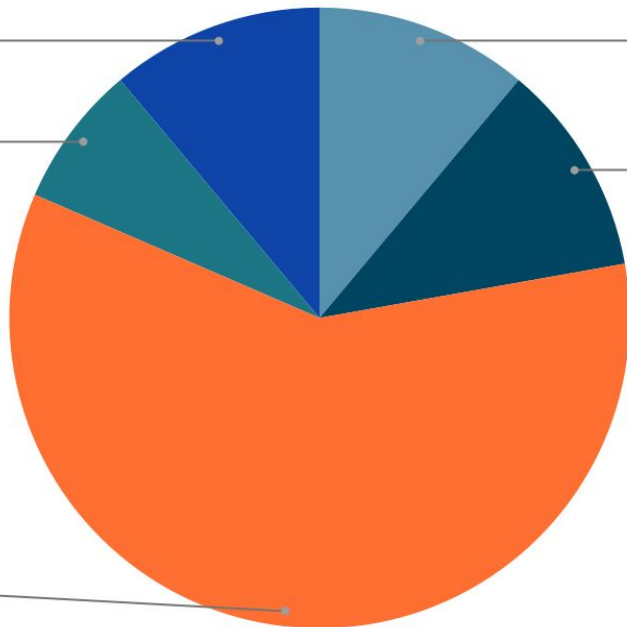
59.3%

Asian

11.1%

Black

11.1%



12%

Hispanic/Latino

76%

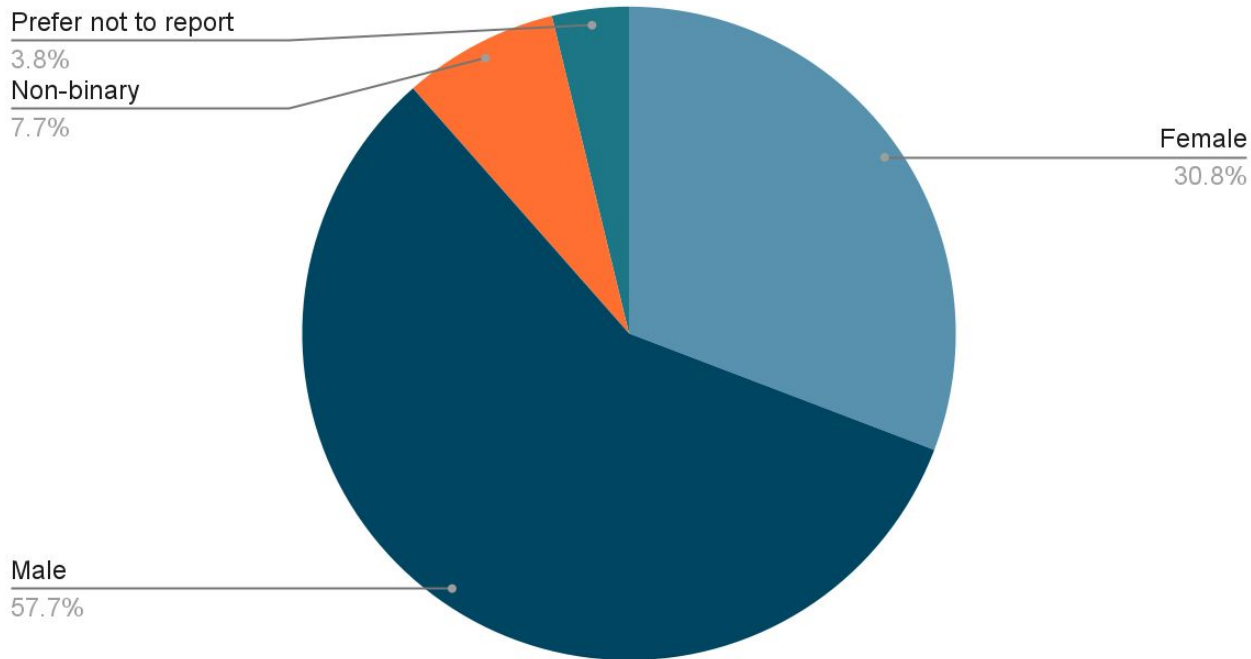
Not Hispanic/Latino

12%

Prefer not to report

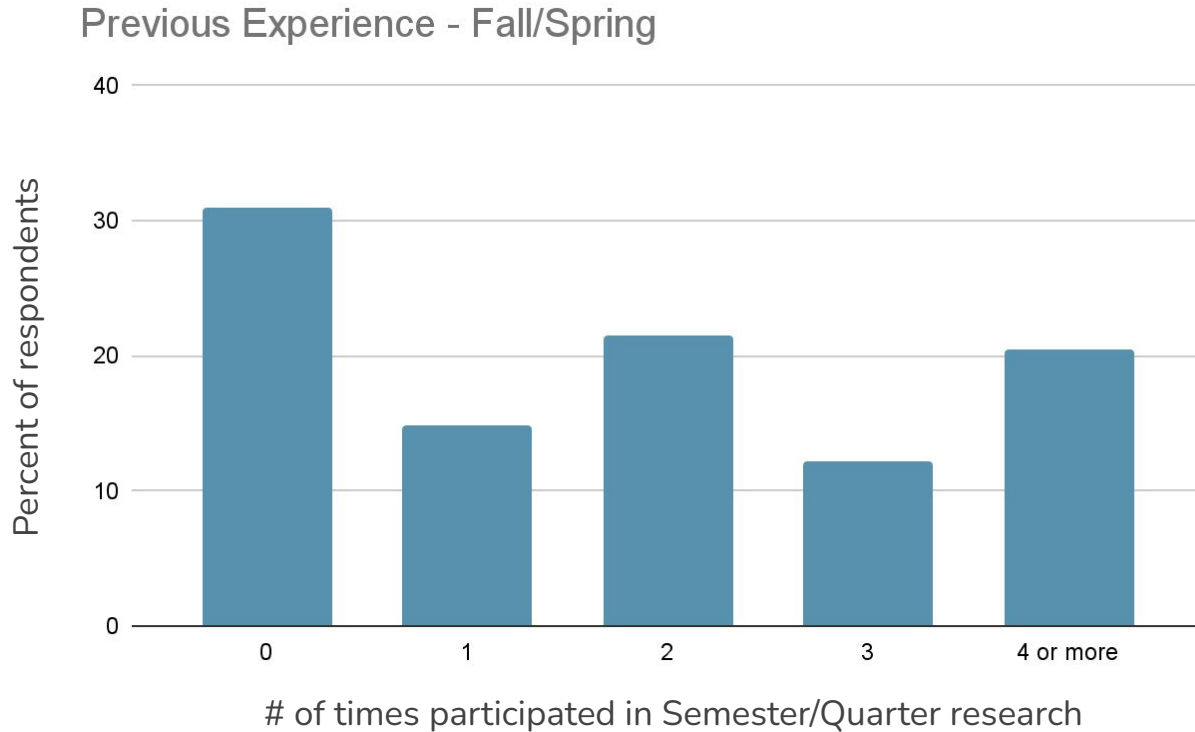
Pre-program survey - Mentors

Sex/Gender





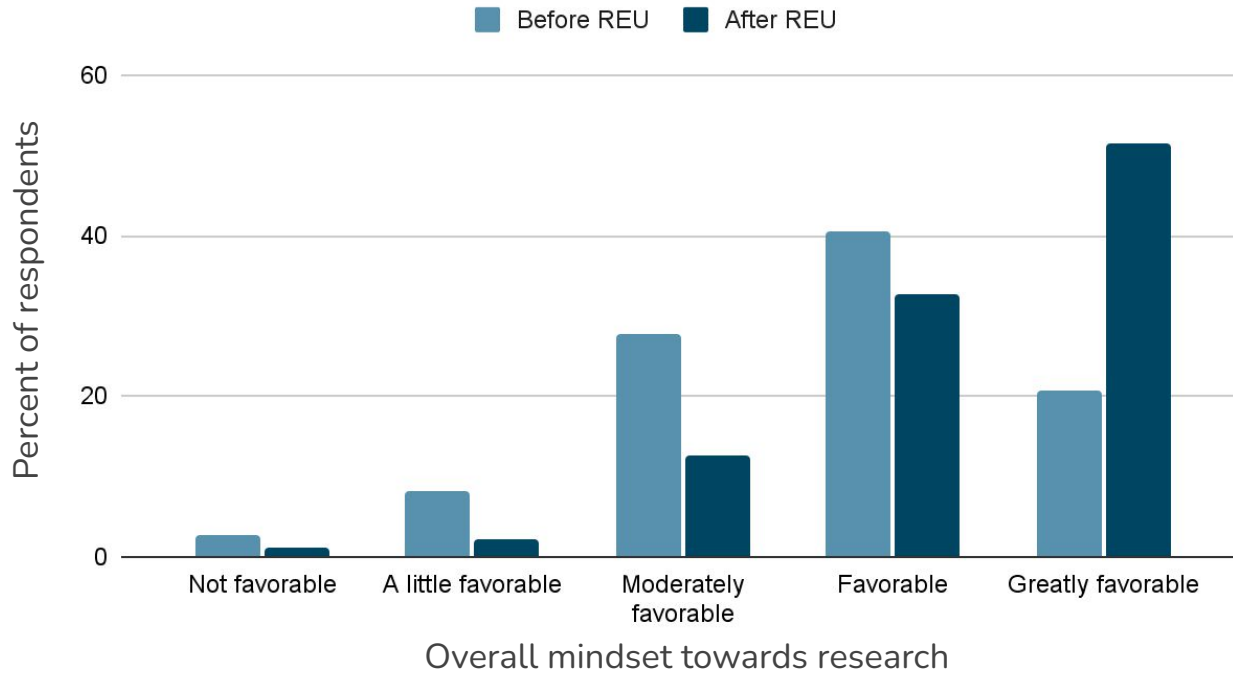
Post-program survey - Mentees





Post-program survey - Mentees

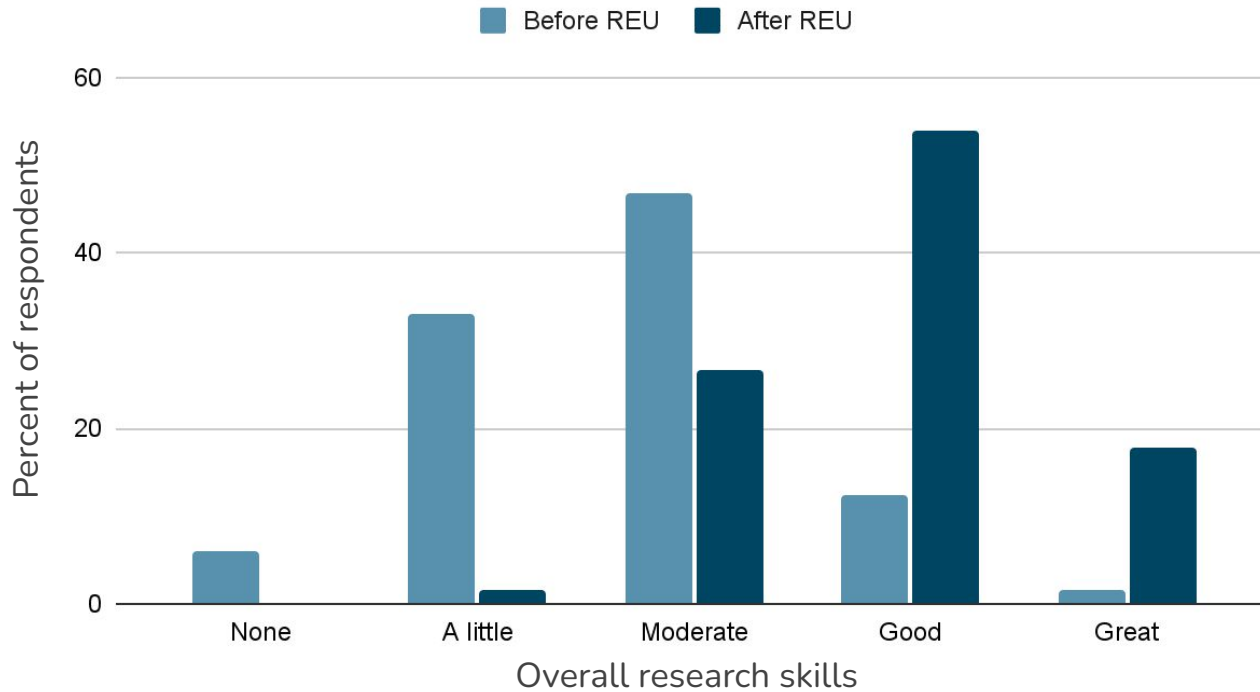
Personal Gains Related to Research Work





Post-program survey - Mentees

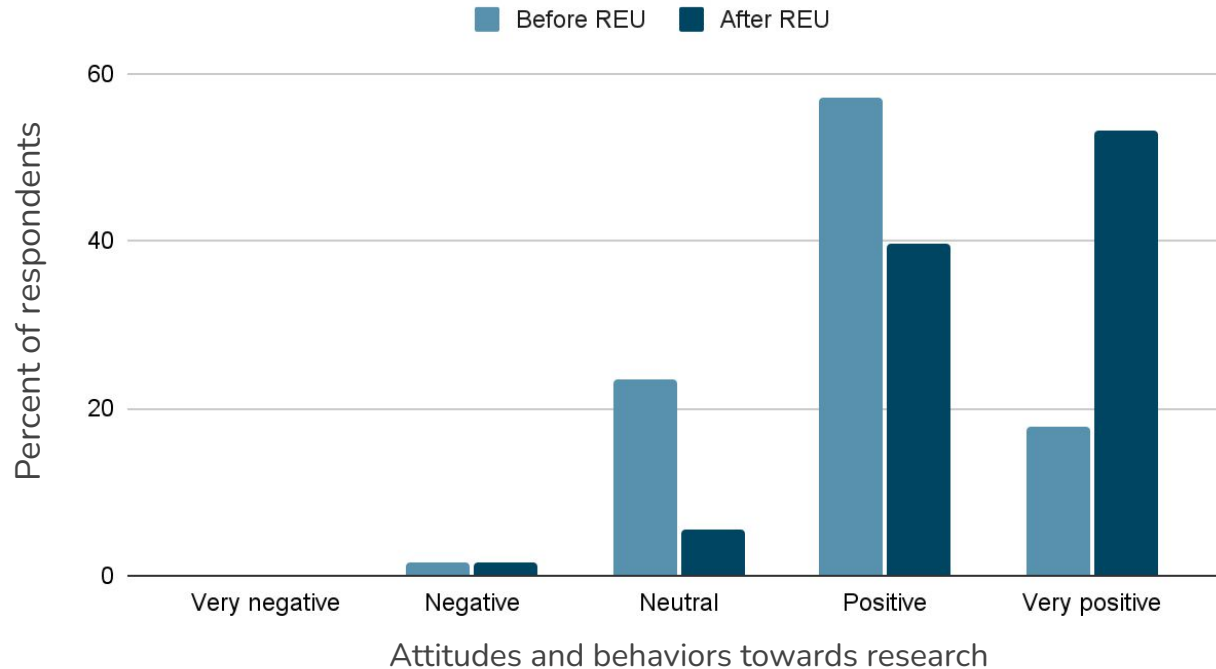
Skills





Post-program survey - Mentees

Attitudes and Behaviors as a Researcher





Post-program survey - Mentors

Previous Experience - Summer

	1: none	2: 1	3: 2	4: 3	5: 4	6: 5	7: 6-8	8: 9-10	9: 11 or more	Mean	N
16. How many times have you mentored an undergraduate engaged in SUMMER research?	9.9%	4.2%	5.6%	4.2%	9.9%	2.8%	16.9%	8.5%	38.0%	6.5	71