Student Preparedness and Motivations in Introductory Physics Courses

PAUL R. MACPHERSON INSTITUTE FOR LEADERSHIP, INNOVATION AND EXCELLENCE IN TEACHING

Nitara Fernando,
Dr. Miranda Schmidt, Dr. Pat Clancy

McMaster University

Background

Life Sciences

N= 1400 - 1600

Chemical and
Physical Sciences

N= 100

Engineering

N= 1100

Goals

1. Understand motivations of students for choosing the life sciences stream
2. Investigate differences between the three cohorts
3. Find ways in which student experience can be improved

Methods: **Surveys**

- Online surveys distributed to introductory physics students through course webpage
- ~2 week time interval to complete survey

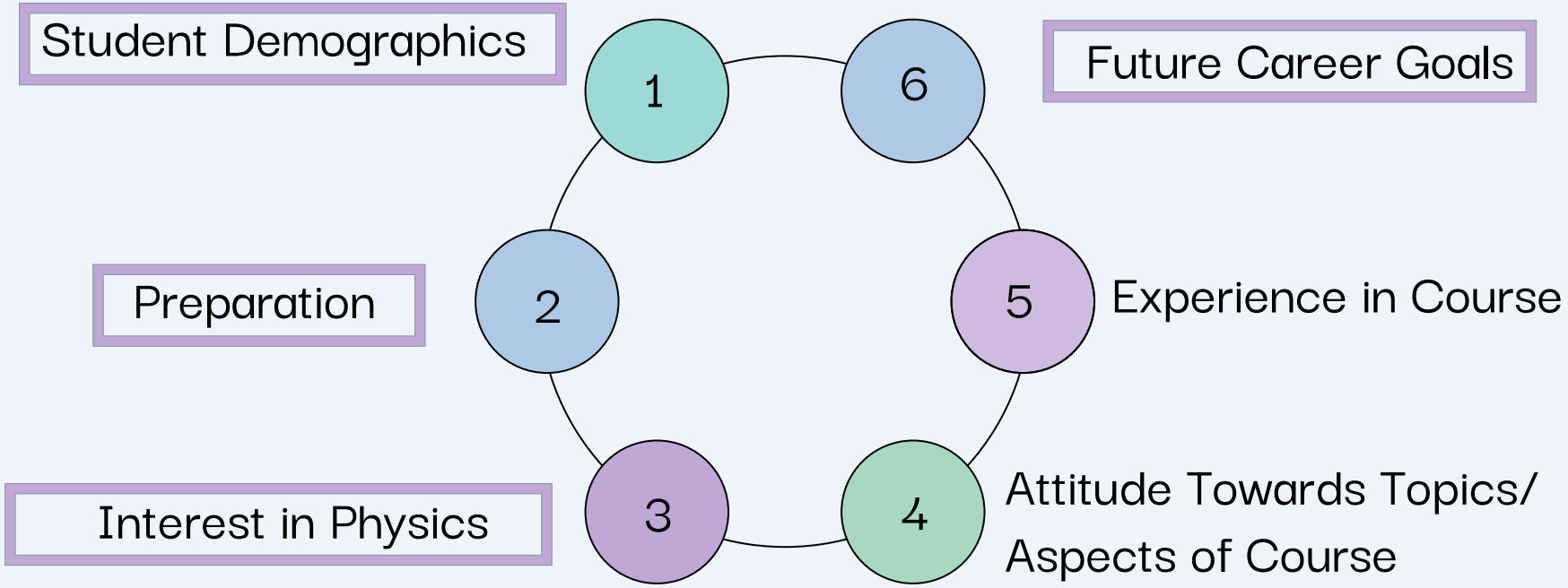
End of Term Surveys:

December 2020
March 2021
December 2021
March 2022

Start of Term Survey:

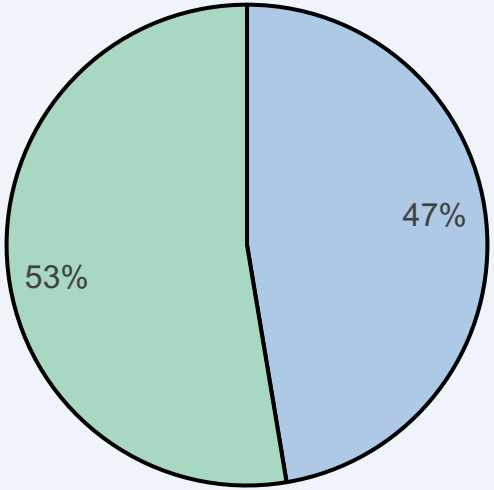
September 2021

Survey Themes



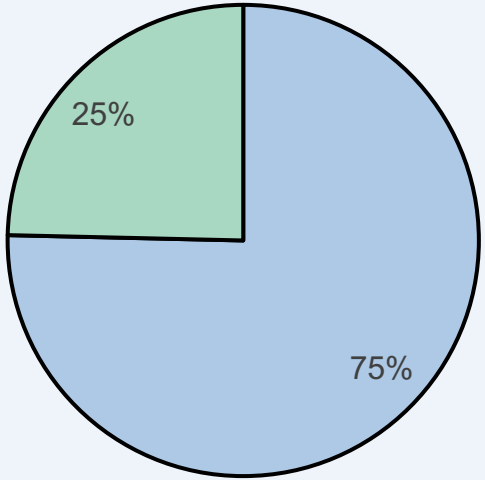
Results: **Survey Demographics**

Chemical and Physical Sciences



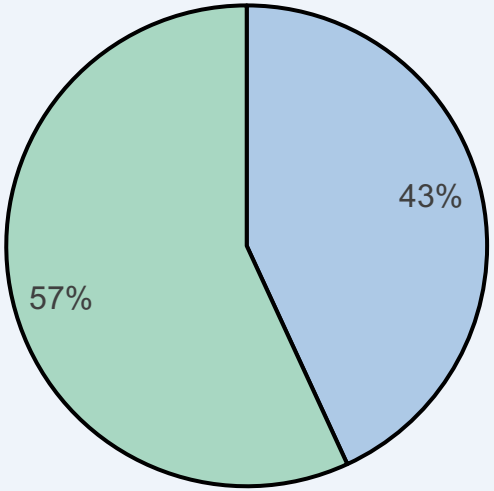
N = 80

Life Sciences



N = 300

Engineering

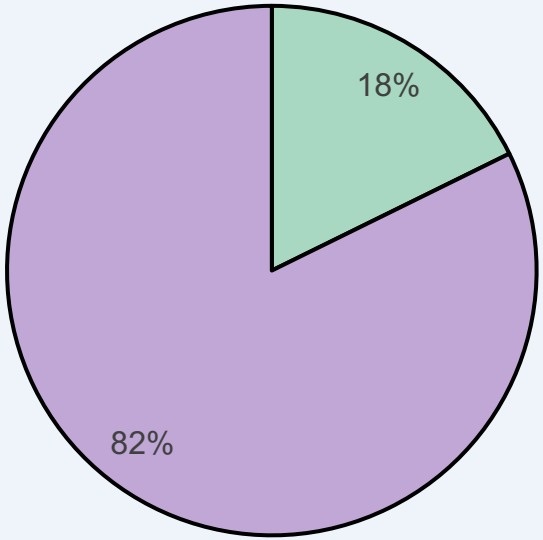


N = 440

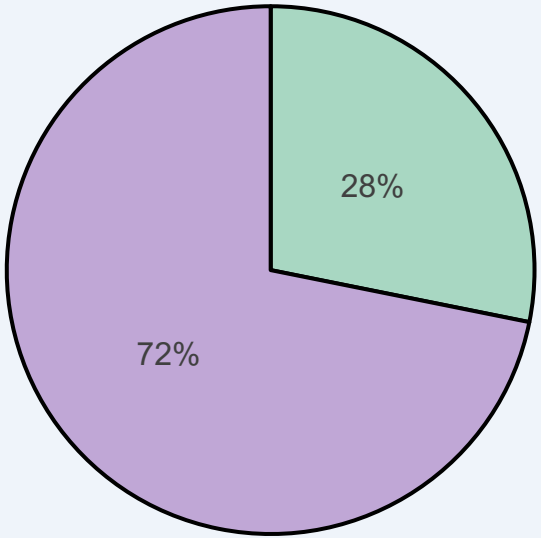
Female Male

Results: **Survey Demographics**

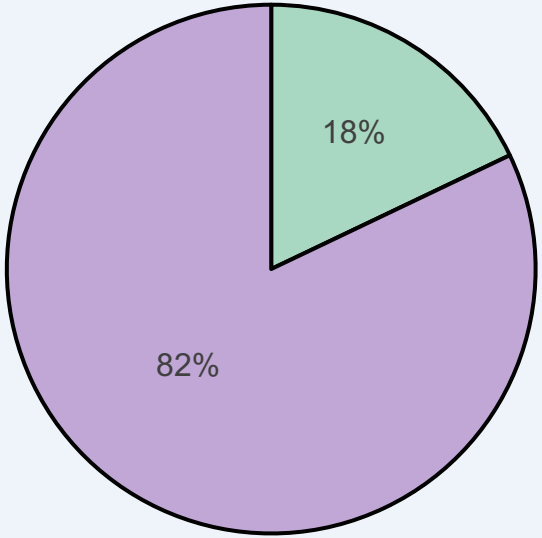
Chemical and Physical Sciences



Life Sciences



Engineering

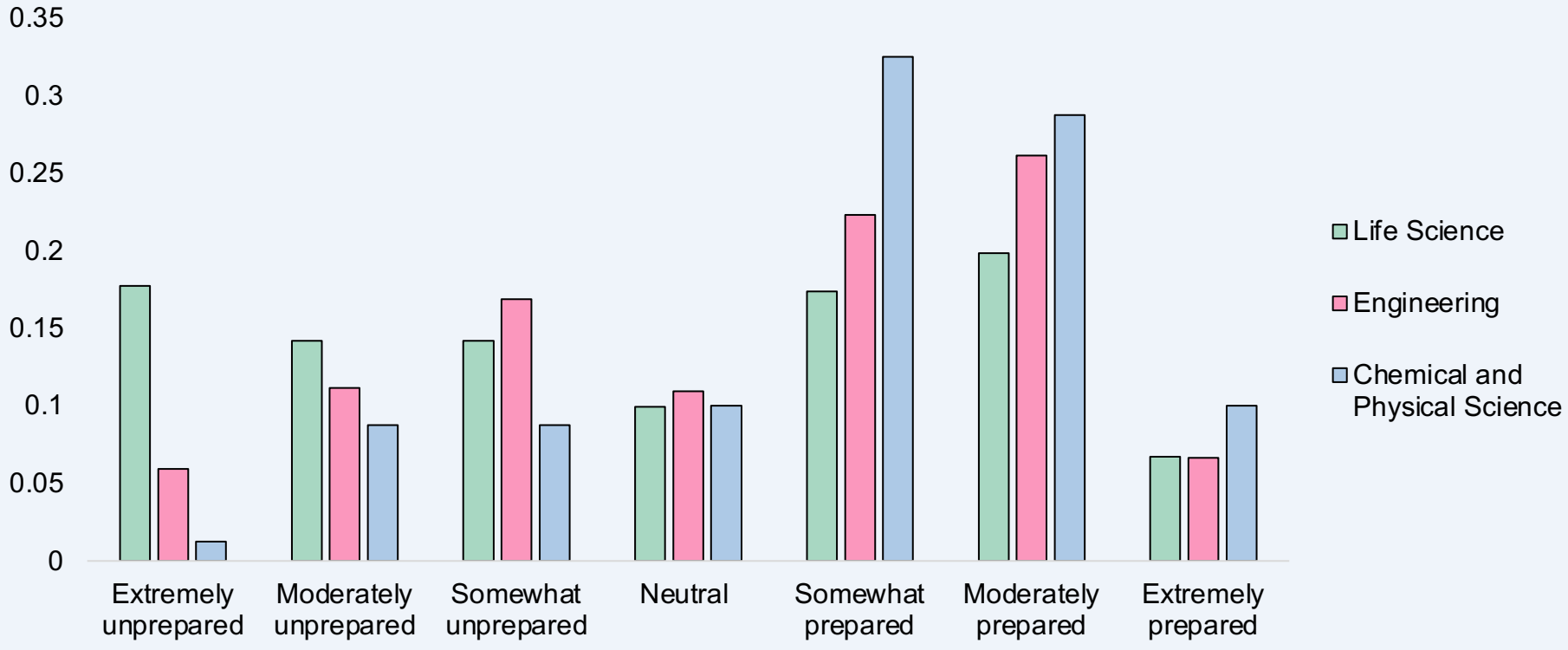


Racialized / Indigenous Non-Racialized / Indigenous

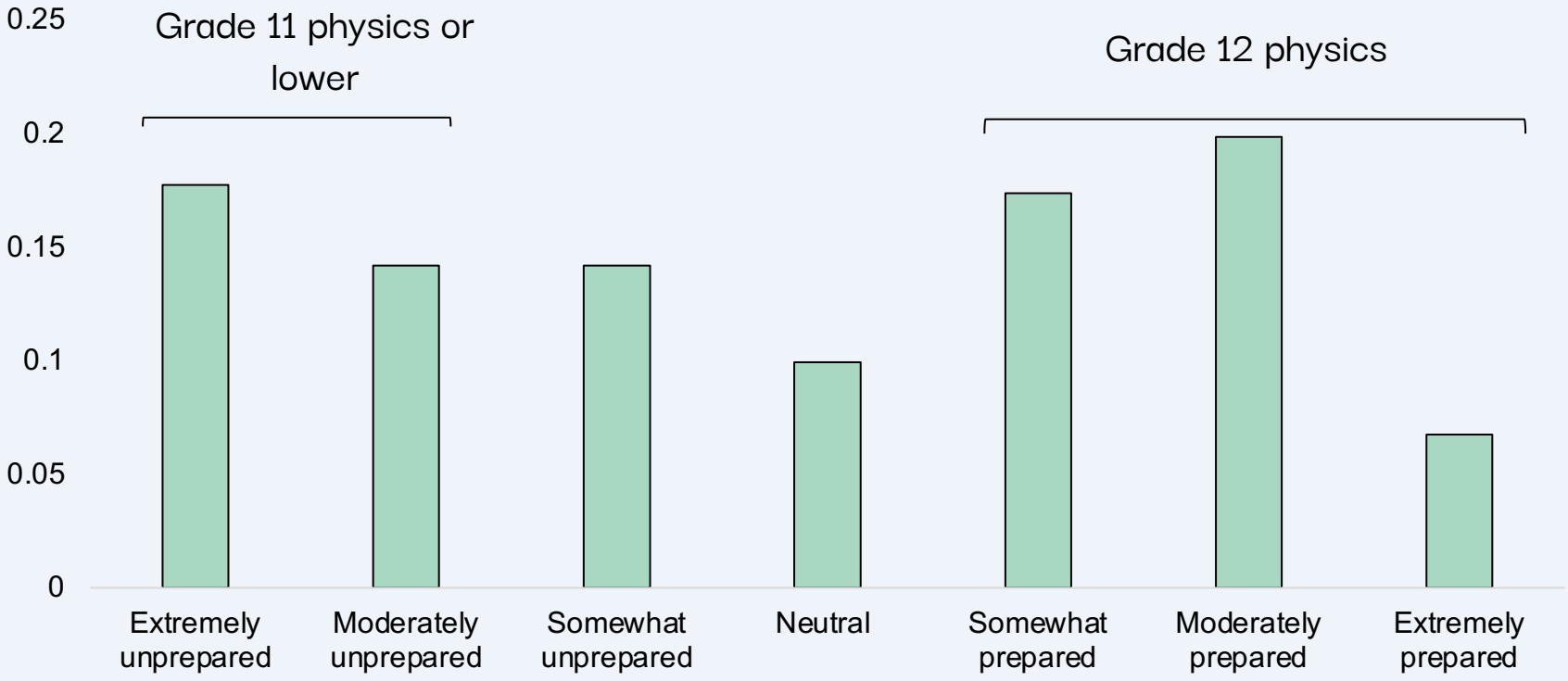
Preparedness

- How prepared do students feel going into the course?

Results: **Initial Preparedness**



Results: **Life Sci Cohort - Initial Preparedness**

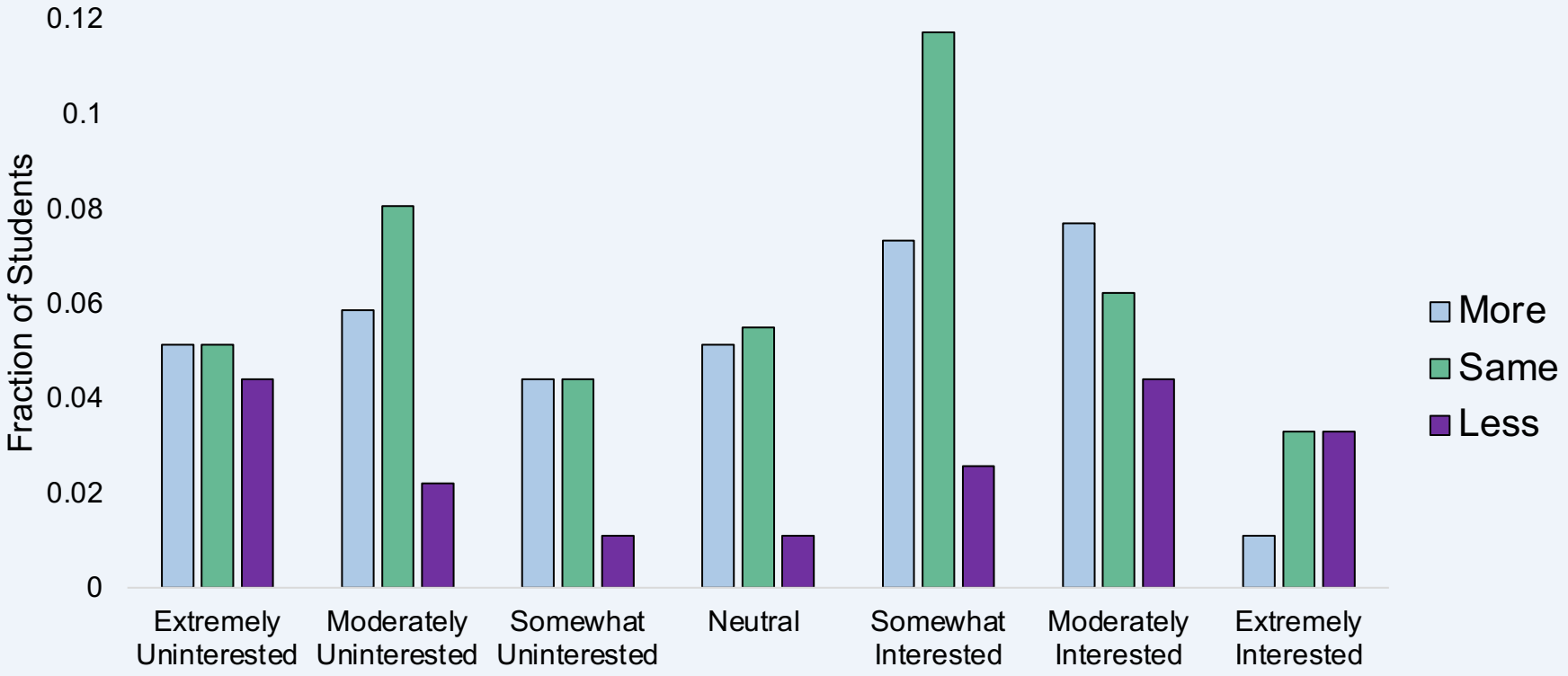


Motivations

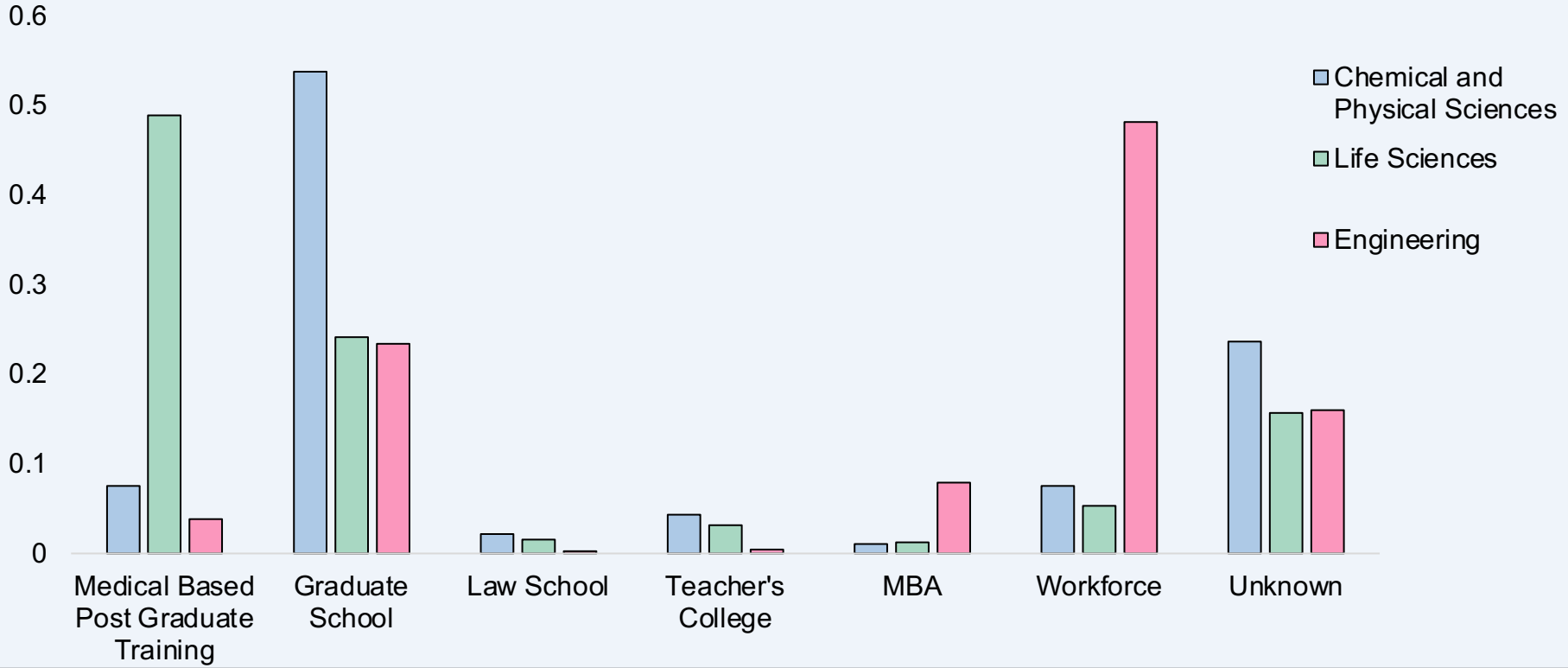
- Why did they choose their stream of physics?
- How interested were students in physics prior to taking the course?
- How did their interest change after a semester?
- What are their future career goals?
- Will they take more physics courses?

Results: **Life Sci Cohort - Motivations**

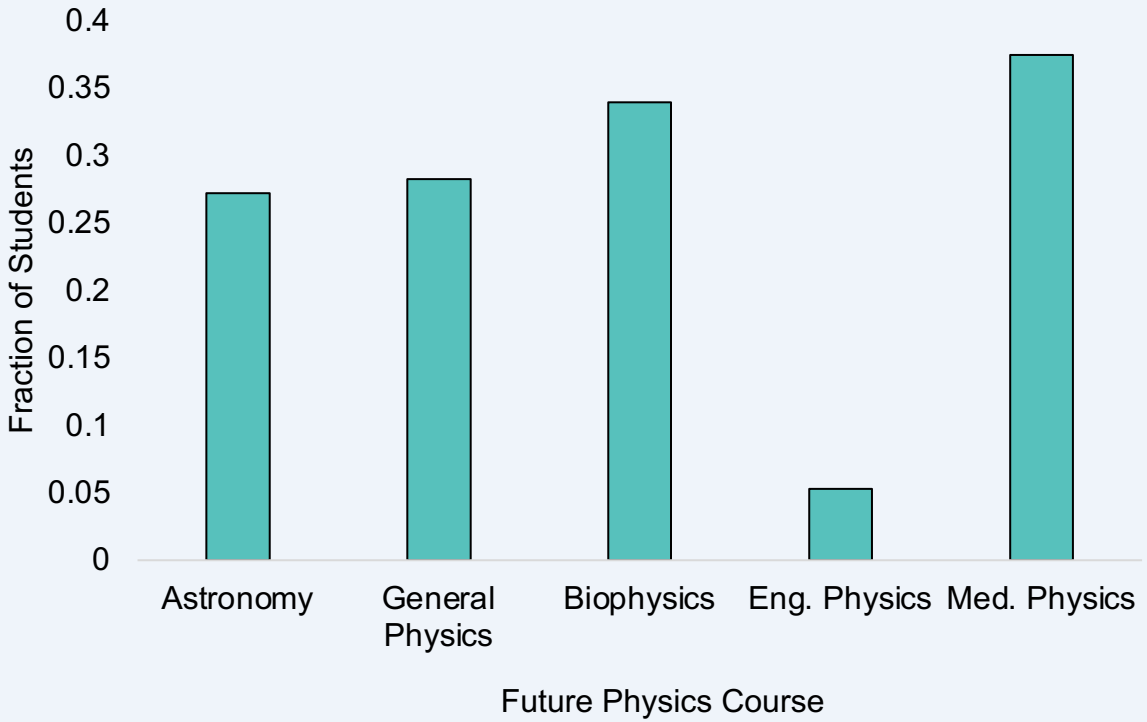
Results: **Life Sci Cohort - Change in Interest**



Results: **Life Sci Cohort – Future Career Plans**



Results: **Life Sci Cohort – Future Physics Courses**



43% will not take another physics course in the future

29% are still undecided

28% will take an upper year physics course

Discussion

- **Highschool background** plays a large role in preparedness of life science cohort
- Student **interest** in the life science cohort stays the **same or increases** through the semester
- Life science students are interested in **medical** and **biological applications** of physics

Thank you!

- **Highschool background** plays a large role in preparedness of life science cohort
- Student **interest** in the life science cohort stays the **same or increases** through the semester
- Life science students are interested in **medical** and **biological applications** of physics

Thank you!

PAUL R. MACPHERSON INSTITUTE
FOR LEADERSHIP, INNOVATION
AND EXCELLENCE IN TEACHING

Nitara Fernando,
Dr. Miranda Schmidt, Dr. Pat Clancy

McMaster University