Why Do Biology Undergraduates Change Their Major? Understanding the Decision Process Using a Mixed-Method Approach
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Background

- Eccles’ Expectancy – Value model conceptualizes expectancy and subjective task value as two determinants of choice of major
- A major developmental and schooling transition, college freshman year is crucial for undergraduates’ choices of major
- Demographic, achievement and motivational backgrounds predict what freshman biology students experience and choose
- However, limited studies
  - asked students’ own explanations for their choices of major
  - investigated the ongoing decision process in 1st college biology class

Research Questions

RQ1: Why do biology undergraduates want to change their major after taking their introductory biology class?
RQ2: Do different students give different reasons?

Methods

Sample
- Freshman undergraduate students in a gateway Biology class (N = 882) in fall of 2016 in a large public university in California
- 237 participants:
  - 73.8% female, average age = 18.08 years old
  - 39.2% Latino, 24.1% Southeast Asian, 13.9% East Asian, 13.5% White
  - 52.7% first-generation college students
  - 87.8% intending to enter biological majors at beginning of class
- Survey completed in last week of instruction, before final exam
- 52.7% first-generation college students
- Certainty about major
- 237 participants:
  - Reasons for change in major choice
  - Only students responding to the open-ended question were included
  - Inter-rater reliability: 86.67%

Measures

- Survey completed in last week of instruction, before final exam
- Reasons for change in major choice: “If this course did have an effect on your major choice, please explain in what ways.” (open-ended)
- Certainty about major: “How does this course affect your major choice?” (“It made me less certain about my major”, “no effect,” “It made more certain about my major”)
- Chi-square test for independence & independent T-test (α = .05)

Analyses

- Only students responding to the open-ended question were included
- Gender, ethnicity, first-generation college-going status or midterm scores did not affect students’ decision to answer the question
- Inter-rater reliability: 86.67%
- Pearson χ² test for independence & independent T-test (α = .05)

Findings & Future Directions

- Change in expectancy and valuing of Biology are major reasons why freshmen biology undergraduates change their major
  - lower confidence or lower valuing are the reasons for “leave” intention; higher valuing, not expectancy, is the reason for “stay” intention
  - Advisory on biological majors and careers & recourses for improving resilience can help freshman biology undergraduates in college transition
- Exam scores did not affect students’ decision to answer the question

Results

RQ1: Why do biology undergraduates want to change their major?

- Change in Expectancy/Confidence
  - “I came in very confident about my biology knowledge and thinking that I would do average at best, but now that it is the ending of the quarter, I’m very concerned that I won’t pass the class and have begun to second guess whether being a bio major is the right choice for me. Despite the fact that I love bio as a subject and can’t see myself doing anything else than bio.”

- Change in Subjective Task Value
  - “This course made me realize that I was really interested in Biology, because I would always walk out of class either thinking ‘I’m mind-blown’ or ‘wow that was cool’.”

- Other Reasons
  - “I want to specialize and be more specific in what I want to learn in biology.”

RQ2: Do different students give different reasons?

Reasons for Change in Major Plan

• Change in expectancy and valuing of Biology are major reasons why freshmen biology undergraduates change their major
  • lower confidence or lower valuing are the reasons for “leave” intention; higher valuing, not expectancy, is the reason for “stay” intention
  • Advisory on biological majors and careers & recourses for improving resilience can help freshman biology undergraduates in college transition
THANK YOU
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