

Investigating the Effectiveness of Interactive Online Interventions to Promote Belonging

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Research Questions

RQ1: What is the **impact** of the intervention (IOI vs in-person) on students' sense of belonging and achievement in introductory physics?

- Use belonging survey (pre/post) and exam scores

RQ2: To what extent is the impact in RQ1 moderated by student demographics and the use of EBAE strategies by the instructor?

Presentation will focus on analysis of IOI log file data collected during Spring 2025 pilot. Results will be used to inform revisions for Fall 2025.

Current Research Focus

How do students engage with the IOIs?

1. Analyze written responses from intervention
 - Compare In-person responses on paper to IOI textboxes
2. Video viewing time and choices within IOI
 - Analyze log files for patterns of student behavior

Goal: Use findings to revise IOIs for Fall 2025.

Week 1: What Worries You?

In Class Intervention

Questions projected on screen:

1. What are you concerned about?

Write down a few things in terms of college, this course, your major, etc.

2. How do you think these concerns will change over time?

Anonymous

3-5 minutes at End-of-First Class

Provide quarter sheet of blank paper

Submit on way out the door, no credit given

Week 1: What Worries You?

Online Intervention

Questions embedded in IOI:

In the textbox, type a few sentences about what you are most concerned or worried about right now.

Enter your answer here

In the textbox, type a few sentences about how your worries will get resolved.

Enter your answer here

Not Anonymous

Not timed

Typed responses

Submit for completion credit

Analyzing the written responses: Paper

1. I'm
people on
time this
going to

2. I t
with

1) I'm scared of failure/inadequacy, burning out, or having taken on more than I can handle. Maybe I'm not cut out for my major, who knows?

2) Maybe they won't, but if that's the way it is, maybe I belong on a different path. But I'm going to try my best, and that's all I can do.

I'll manage my
gh time to
stuff?
ajor for me.
also a firm
b an but I'm
k on.

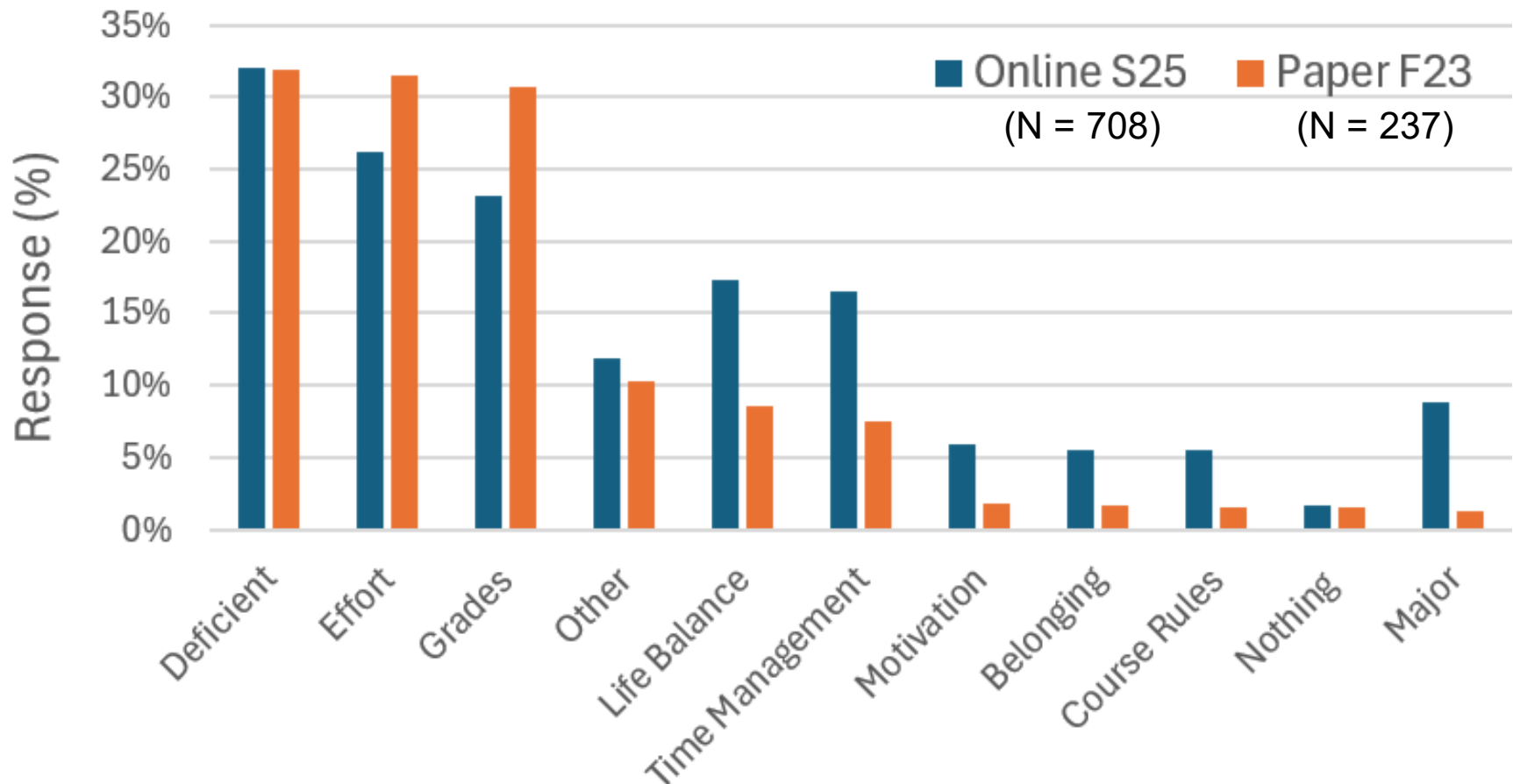
Analyzing Textbox Responses: IOI

In the textbox, type a few sentences about what you are most concerned or worried about right now.

I'm worried about not being able to keep up with everyone else and falling behind even though I put in the work. I also worry that I won't be able to make friends in my classes and I am concerned as to whether I chose the right major.

Textbox responses were downloaded into an Excel log file for analysis.

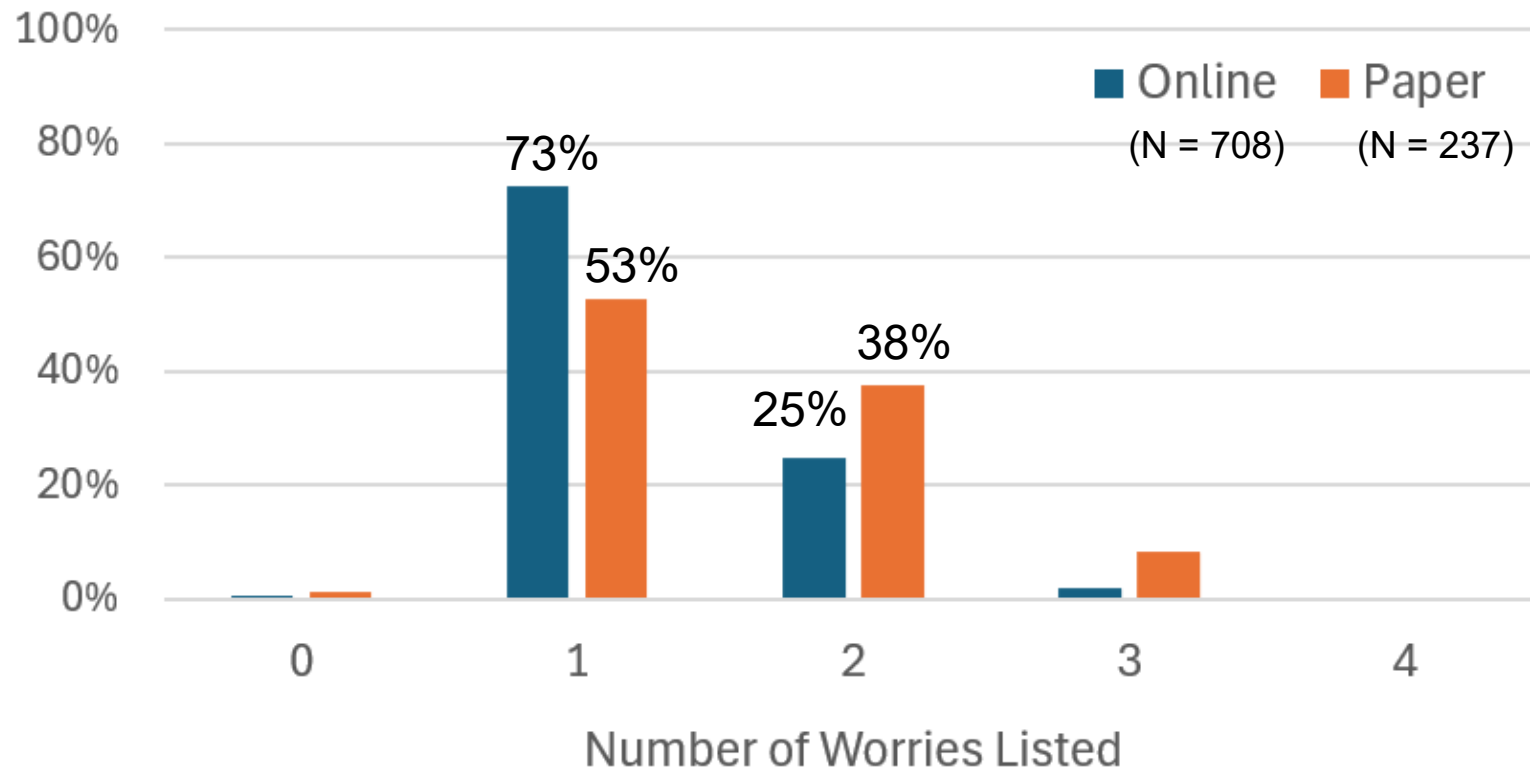
Distribution of Worries



Note: S25 IOI students were in their 2nd semester of college.

Average Wordcount: IOI = 24.7; Paper = 21.6

Number of Worries Listed



IOI revision: Students will be encouraged to write down multiple worries.

Engagement with Textboxes

Week 1: What Worries You? IOI included three textboxes:

What are you worried about right now?

How will these worries get resolved?

What are two actions you can take immediately to address concerns?

High Textbox Completion Rates:

98% completed all three textboxes with appropriate responses

1% completed two of the three textboxes with appropriate responses

Patterns of Student Behavior within IOI

Log Files

1. Textbox responses
2. Branching choices (ex. student testimonial selected)
3. Time spent viewing videos

Week 1 IOI: Choice of testimonial

What Worries You?

Interactive Online Interventions

Select the video you would like to watch, then click the *Next Page* button



Meet Nathan,
Computer Sciences senior.



Meet Allison,
Mechanical Engineering senior.

31% chose Nathan

65% chose Allison

4% chose both

← Back to Previous Page

Options ▾

Continue to Next Page →

n = 706 students



Would like students to choose both but give option to promote student agency.

To view another student's video, click the *Previous Page* button.

← Back to Previous Page

Options ↕

Continue to Next Page →

IOI Revision:
Include page to make choosing another testimonial more obvious.

Choice of Video to view (Exam Wrapper)

Learning Strategies:

Before Class

During Class

After Class

Exam Prep

Exam Wrapper

Interactive Video Tutorials

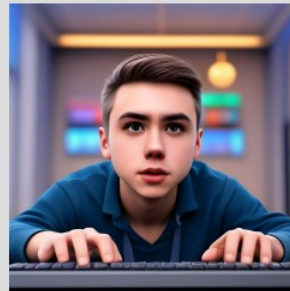
Choose from the following to explore research-backed learning strategies that have been shown to enhance comprehension and retention. The strategies have been organized into four key areas. You will have the opportunity to learn about more than one, if desired.



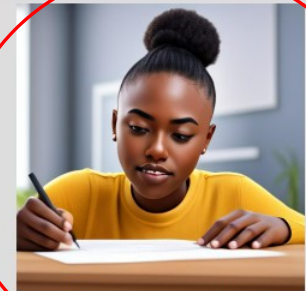
Before class preparation



During class engagement



After class review and approach
to homework



Exam preparation

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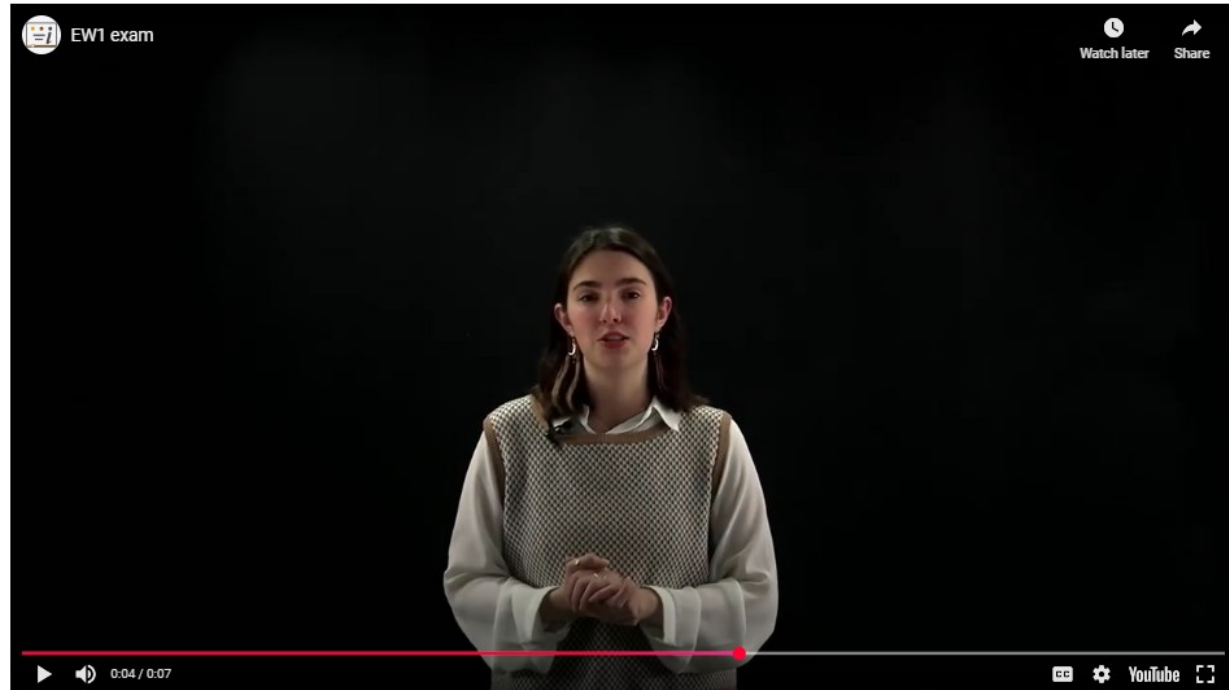
Options ↕

Continue to Next Page →

75% chose Exam Prep

Choice of Video to view (Exam Wrapper)

This extra page made a difference in students selecting more than one video.



Consider choosing an option other than **Exam preparation** that you haven't viewed yet.

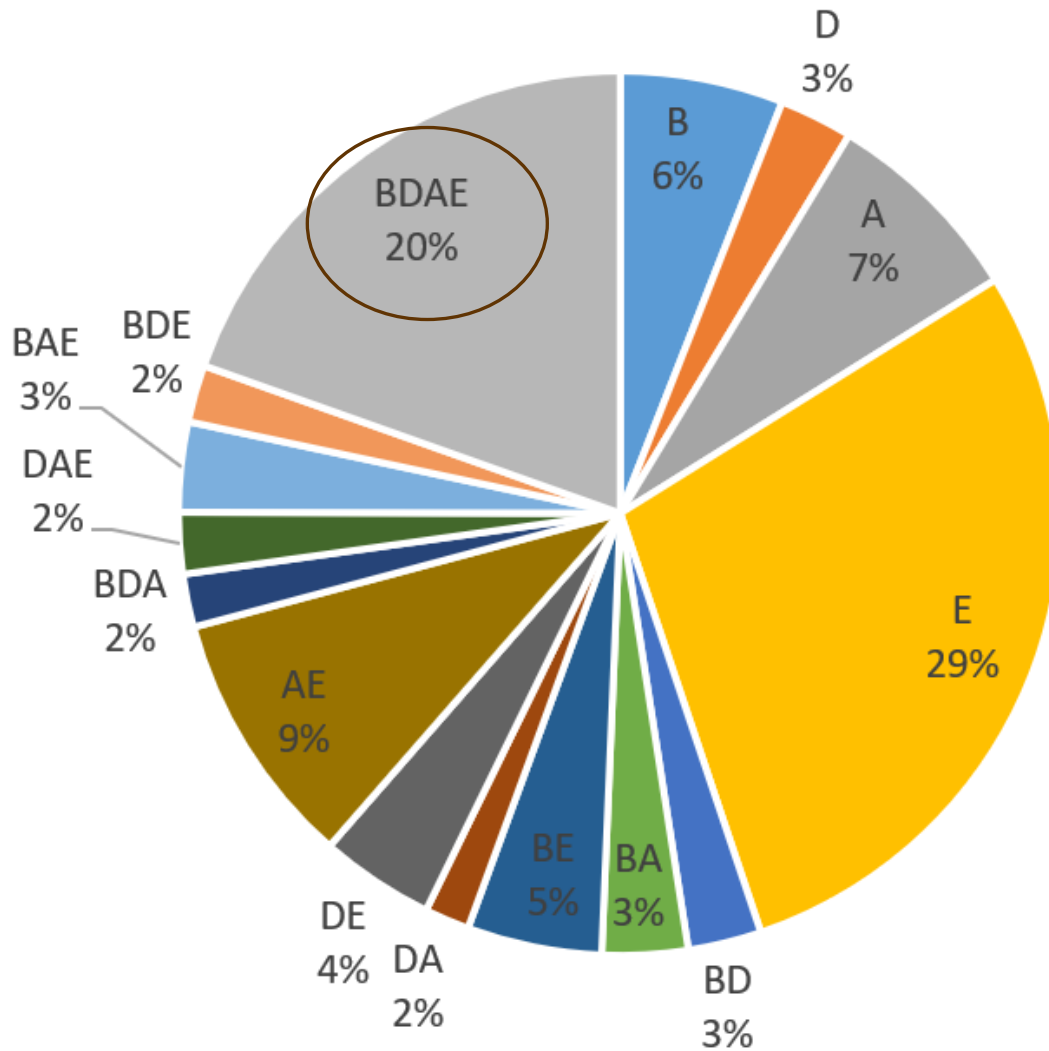
- ☐ Before class preparation
- ☐ During class engagement
- ☐ After class review and approach to homework
- ☐ Exam preparation
- ☐ Continue to the next section

← Back to Previous Page

Options ▾

Continue to Next Page →

Choice of Learning Strategy Video to view



B: Before class

D: During class

A: After class

E: Exam Prep

45% selected ONE

20% selected ALL

N = 708

Video Time Log Analysis

What Worries You? IOI - 4 videos essential to IOI messaging

Video Length (min)	Video Description
3:36	Student data shared: “What worried about right now?”
0:45	Nathan or Allison Testimonial
3:08	Narrator Testimonial (grad school)
1:45	Wrap Up – Action Steps

*Did not include videos that had textboxes in above analysis

Video Time Log Analysis

What Worries You? IOI - 4 videos essential to IOI messaging

Video Length (min)	Video Description
3:36 1:40	Student data shared: “What worried about right now?”
0:45 0:40	Nathan or Allison Testimonial
3:08 2:00	Narrator Testimonial (grad school)
1:45 1:30	Wrap Up – Action Steps



Identified minimum viewing time needed to hear message.

Video Time Log Analysis

What Worries You? IOI - 4 videos essential to IOI messaging

Watched Minimum	Video Description
54%	Student data shared: “What worried about right now?” (1:40)
17% , 37%	Nathan or Allison Testimonial (0:40)
37%	Narrator Testimonial (grad school) (2:00)
34%	Wrap Up – Action Steps (1:30)

Video Time Log Analysis

What Worries You? IOI - 4 videos essential to IOI messaging

# Videos Watched to Minimum Time	Percent of Students
0	35%
1	17%
2	14%
3	15%
4	19%

IOI Revision: Need to focus on how to engage students in videos.

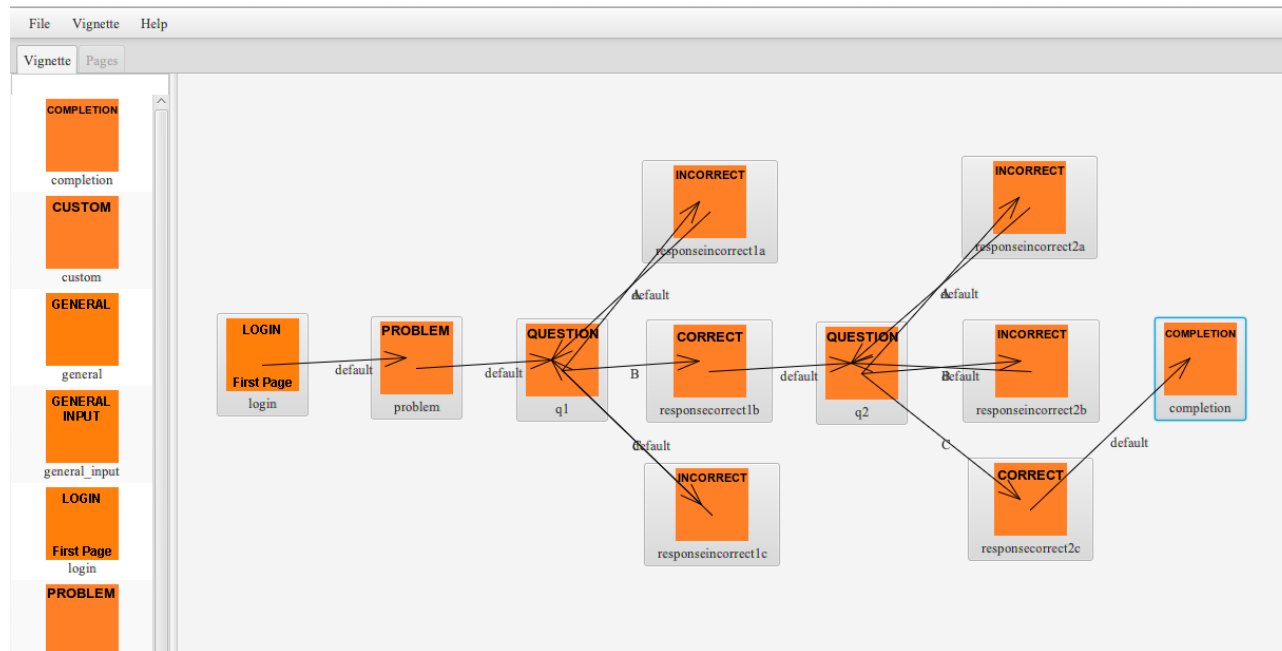
May add some more or reframe those below.

Lessons Learned & Next Steps

1. High engagement when asked to do a task
 - 98% completed textboxes and took them seriously (similar to paper)
2. Students tend to skip videos, even short ones
 - Revise script to include a “need to know” from a video (take notes)
 - Revise video: clarify purpose; convey “we care”; connect to UC/course; use student narrators to engage peers; use faculty for *research* slides
3. Choices driven by topic
 - Most selected videos: exam prep strategies & testimonials by students in similar majors

Create your own IOIs or interactive tutorials

Vignette Studio II software w/text or video guidance: compadre.org/IVET/
(requires very basic familiarity with HTML)



Questions?

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