

Background

- Employer accounts suggest physics graduates are deficient in social and communicative skills [Sarkar et al., 2016].
- Despite widespread support for student development of science communication skills, implementation of relevant resources has been slow and highly localized.

Course details

PHYS 4602: Senior Seminar

required for Physics majors, 1 credit hour, 107/135 consent

Few uncapped sections per year & limited class resources

Students **present once** per semester, often having received little to no instruction and highly varied feedback.

Observed 3 semesters (F23, Sp24, F24) Developed & co-instructed Sp25

107 oral presentations **39** semi-structured interviews

CHEM 4601: Chemistry Seminar

required for Biochemistry majors,

2 credit hours, 28/33 consent

Multiple capped sections every semester & longer class periods

Students **present four times** per semester after three hours of instruction and receive regular, detailed feedback.

Observed 2 semesters (Sp24, F24)

- **82** oral presentations
- 11 semi-structured interviews

W2: Slide Design

Backward design [Wiggins & McTighe, 2005]

New curriculum & reception

W1: Intro to Science Presentations

- Expectations, assignments, & outcomes Slide titles & composition basics [Doumont, 2012]
 - Multimedia learning [Mayer, 2020]
- **W3: Presentation Workshop**
- Flipped classroom day
- Iterate slides in groups Focus on key takeaway(s)

Adapting premade graphics

- **W4: Slide Critique** – "Key slides" only
- Detailed writeup

Brief public feedback

W5: Public Speaking – (Non)verbal communication Staying conversational

- under pressure
- 23 students fully attended the interventional curriculum.

"What was your experience with the lessons at the start of the course?"

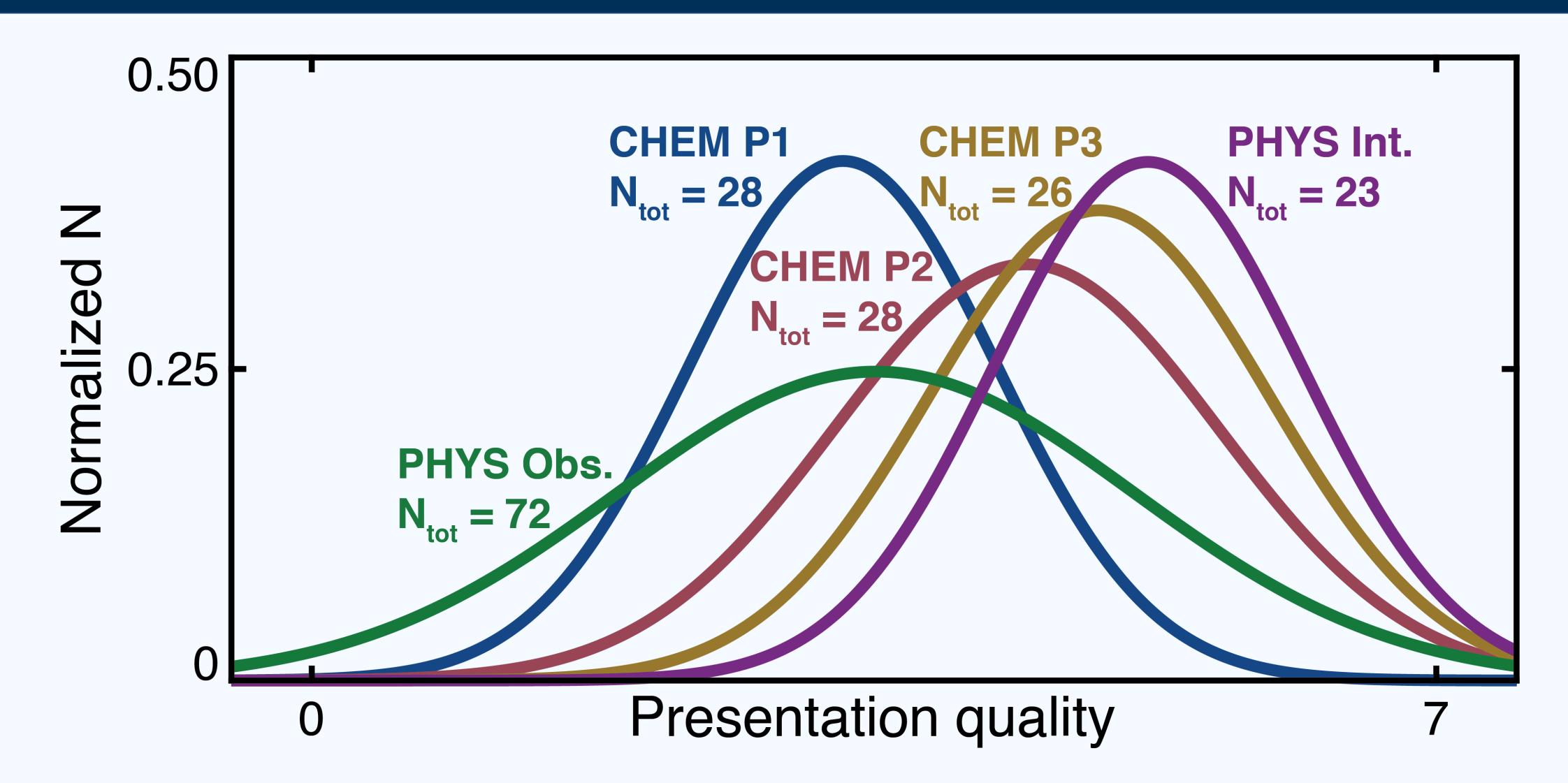
Feedback tally,		Slide		Slide	Public	
19 interviews	Intro	Design	Workshop	Critique	Speaking	Ambiguous
Positive	1	9	4	1	5	5
Mixed	0	1	1	1	1	4
Negative	0	0	1	4	0	1

- Students appreciated learning slide design guidelines (e.g., animations, text and graphic usage) and practicing implementation.
- Students found the workshop useful for building their slides and getting **feedback**, though some felt it was too soon to focus on slide specifics.
- Students were frustrated by critiquing one key slide because it led to irrelevant feedback built on incorrect assumptions about the presentation.
- Students embraced the speaking challenge as initially scary but very helpful. Some requested more feedback and exposure to further build confidence.

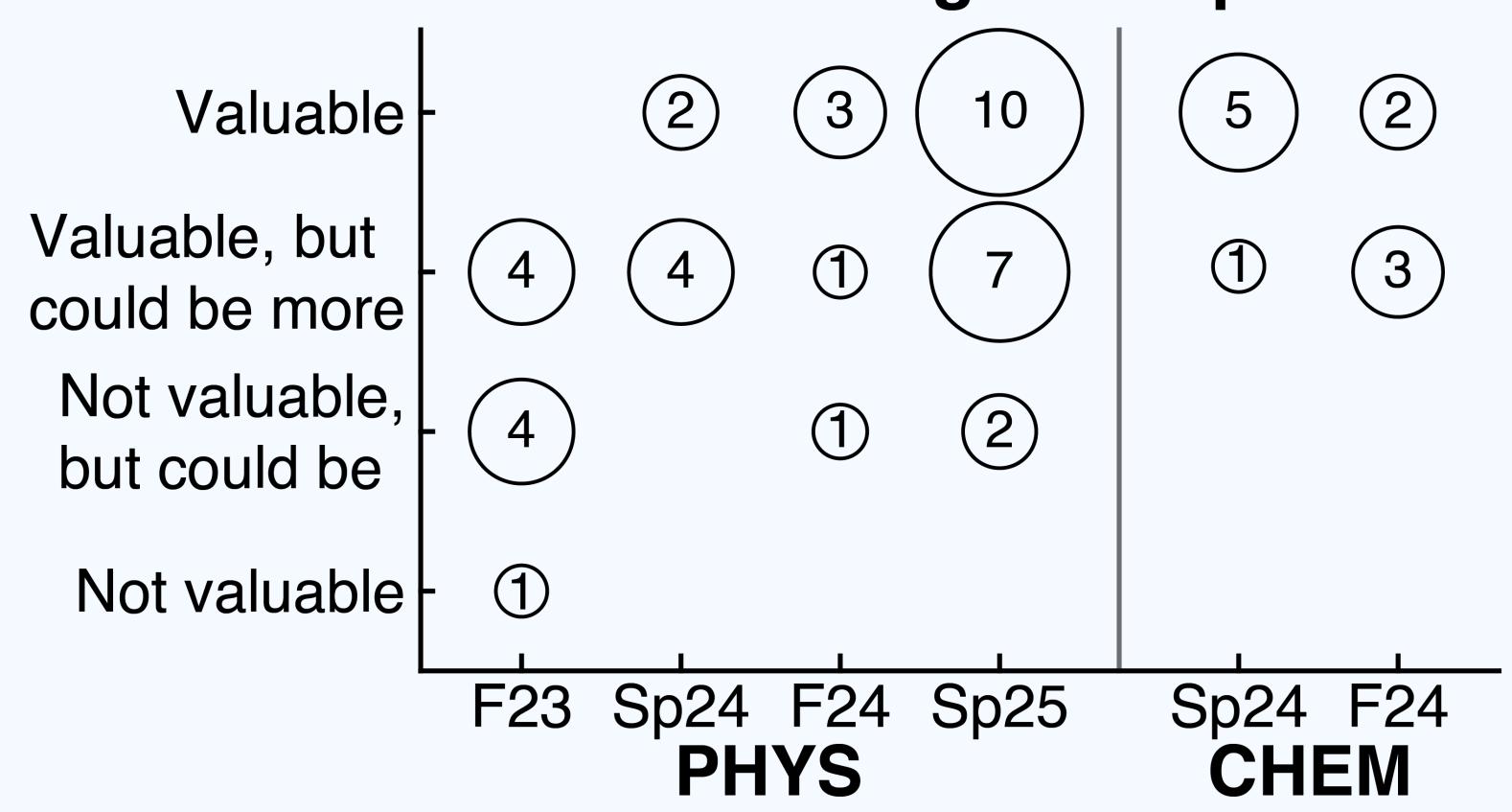
Limitations & future work

- Small sample size and restricted class continuity hinder generalization and detailed examination of confounders.
- Updating the curriculum's focus on key slides to instead emphasize presentation narratives may further improve presentation quality and student reception to a revised slide critique lesson.
- Qualitative analyses may improve understanding of how various feedback styles and sources contribute to presentation quality.

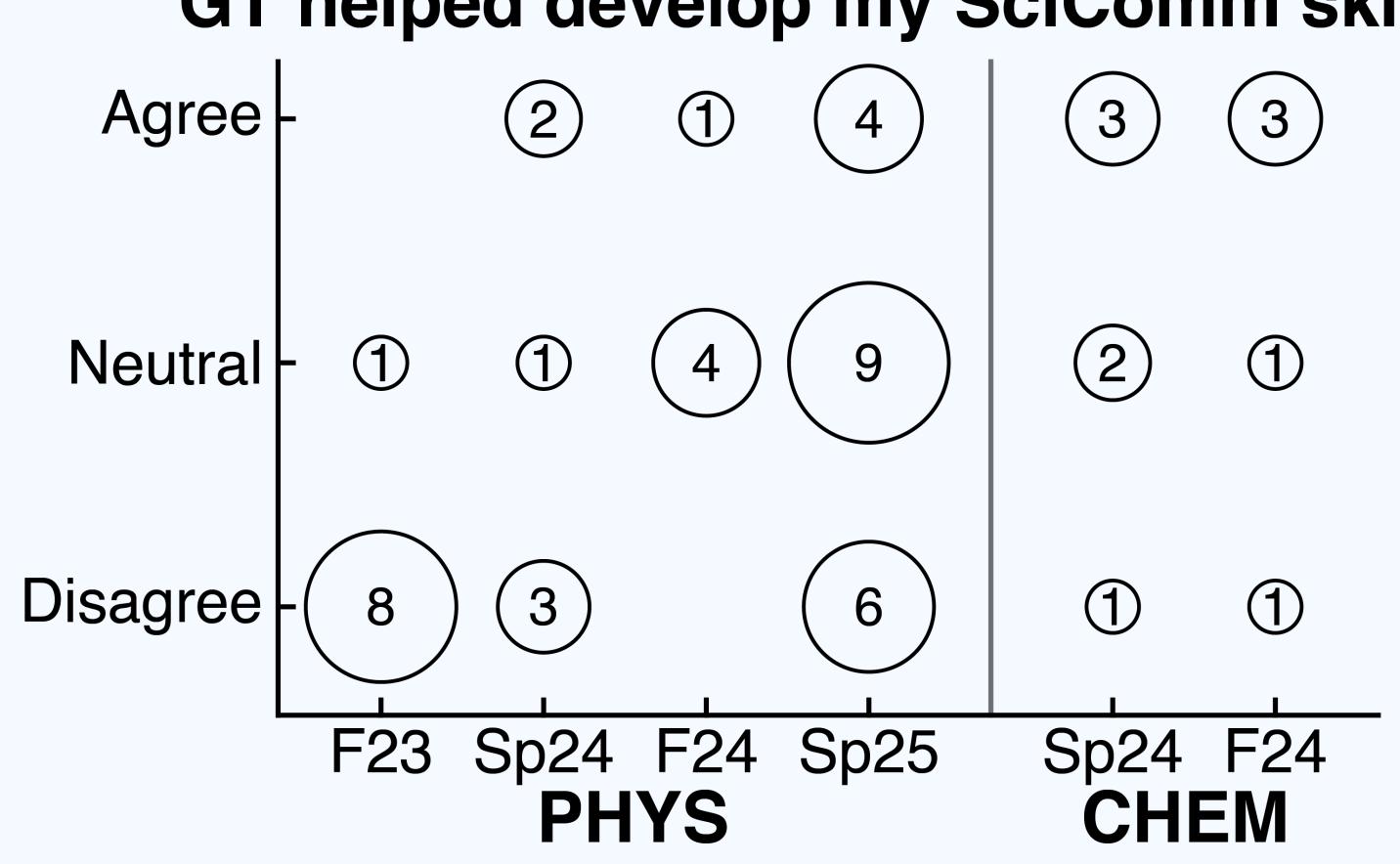
Research-based instruction improved students' science presentations and beliefs comparably to multiple rounds of practice and feedback.



Seminar as a Degree Requirement



GT helped develop my SciComm skills



DEFINING SUCCESS IN SCIENCE MULTIMEDIA COMMUNICATION COURSES