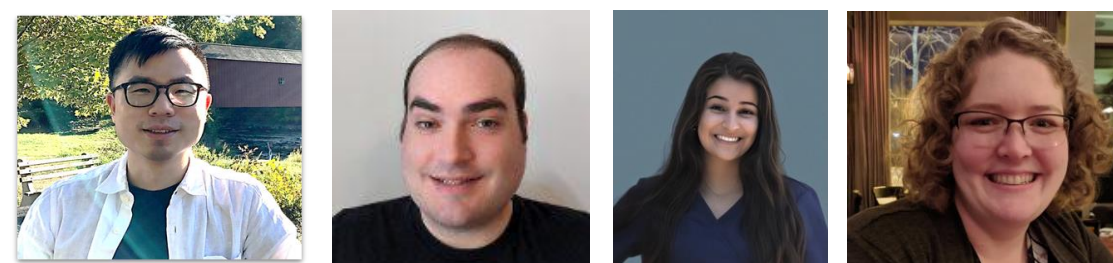


# They're not buying what we're selling: Comparing student-requested supports with instructional practice during group work

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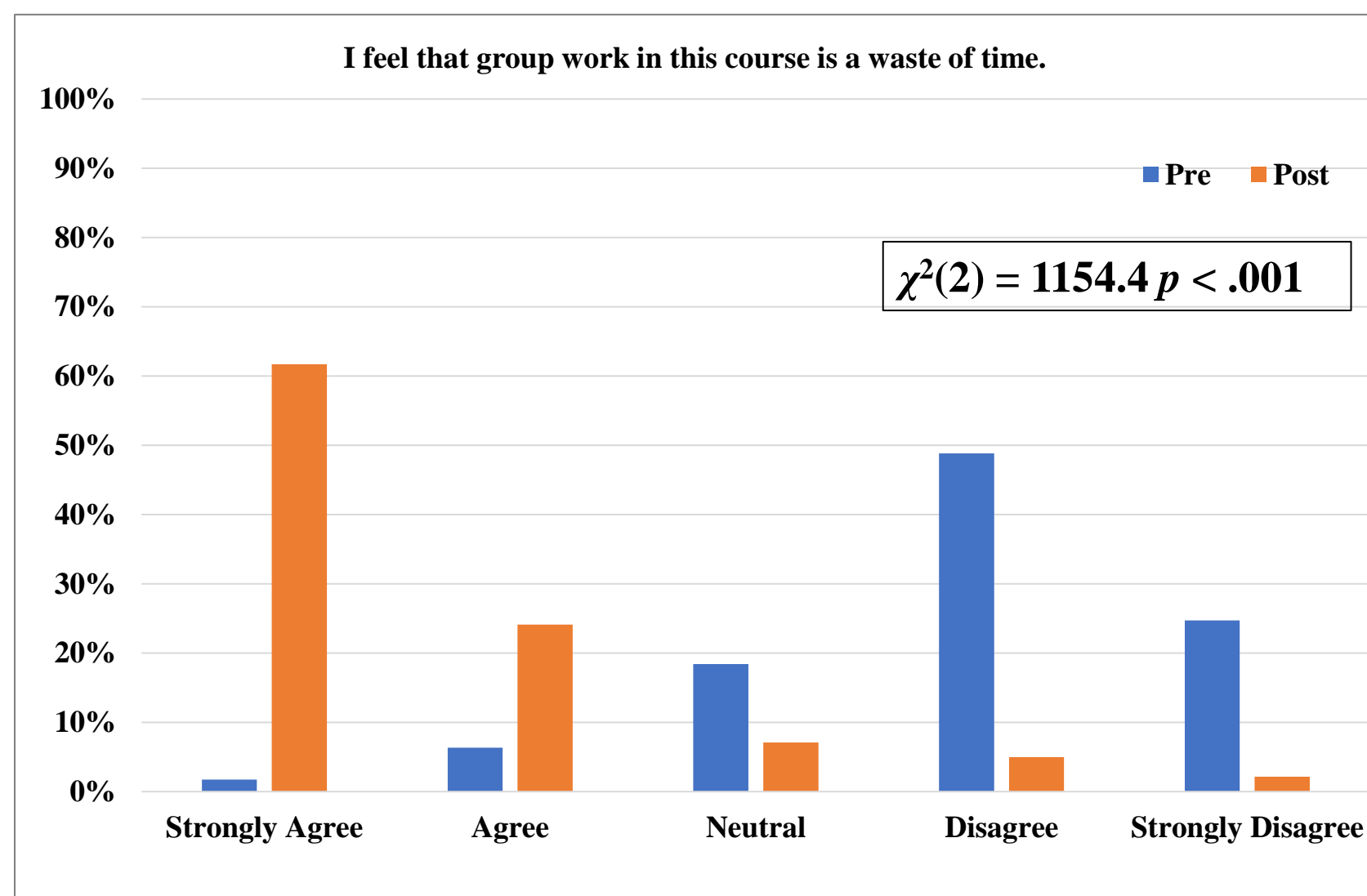
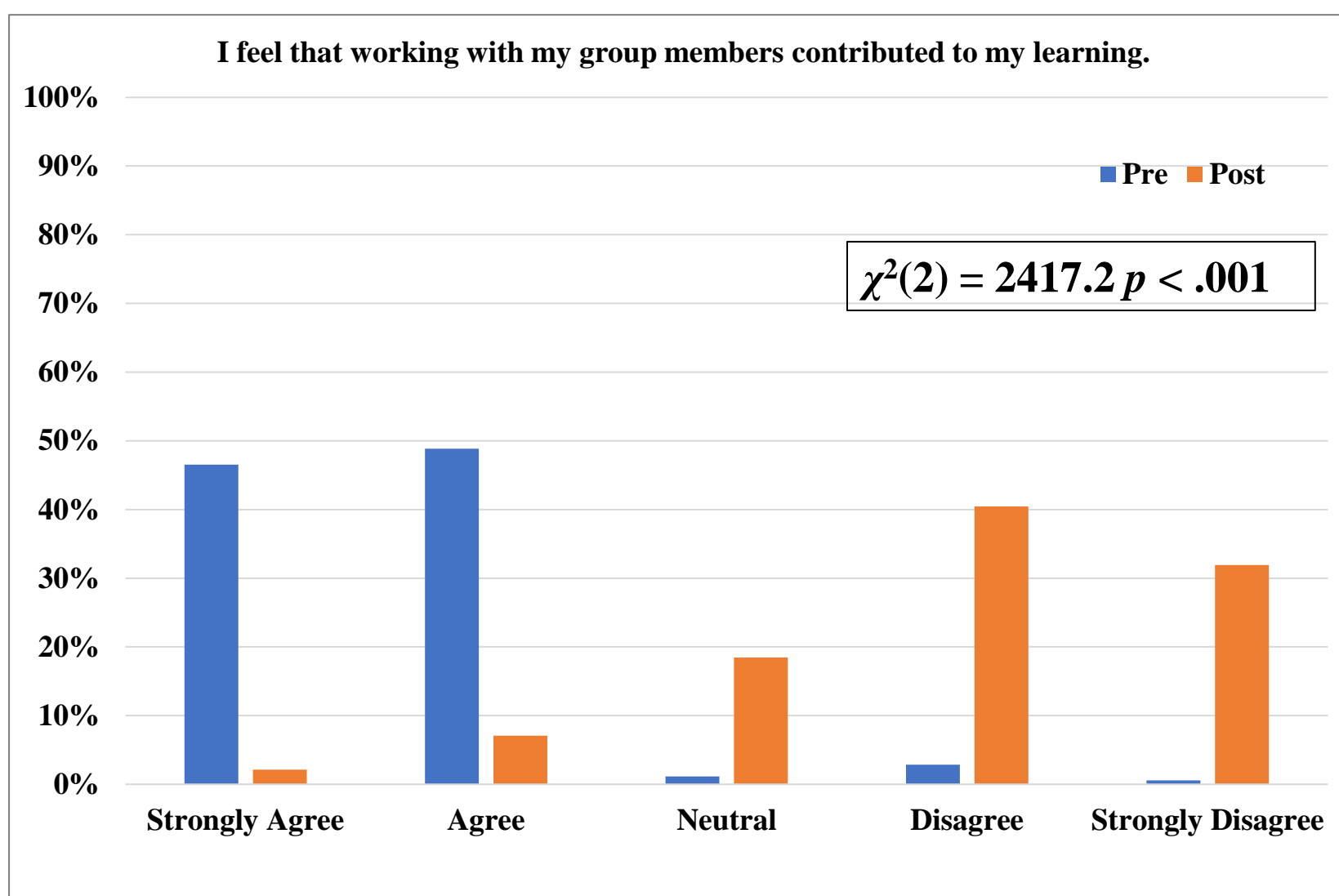
## Introduction:

Group work is an important aspect of many research-based instructional strategies in use in physics education. As part of a larger project to create professional development materials for instructors about group work, we interviewed instructors and surveyed students about their experiences with group work in Spring 2022. We investigated: 1) the relationship between the supports students' request to successfully engage in group work and the support provided by instructors; and 2) the effect of the provided supports on students' attitudes and beliefs about group work.

## Supports students requested to engage in group work before the course:

Theme	Frequency	Student Quotes
Be able to ask questions and interact with instructor(s)	59 participants (33.5%)	"The ability to ask questions for clarification if there is uncertainty within my group." "I like when the teacher constantly checks in with groups to see how things are going, make sure the group is working in the right direction, etc."
Everyone participates and contributes equally in groups	48 participants (27.3%)	"The professor making sure the work is fairly distributed between students and not one doing all the work" "I think having participation requirements or completing group assignments together will help the group dynamic."
None	29 participants (16.5%)	"I cannot think of any support I may need for group work."
Clear expectations for group work	16 participants (9.1%)	"Clear instructions and expectations with each assignment that make it easier to work together."
Start the problems in the right direction	11 participants (6.3%)	"Help from ta in pointing us towards the right direction and giving clear guidelines on how to do the problems." "I also like how if I don't know how to start a problem the TA can show me how to do so."

## What students felt about group work after taking the class:



A total of 176 participants were included from the pre-survey and 141 participants from the post-survey. After combining the responses of "Strongly Disagree" and "Disagree" as the attitude of disagree and the responses of "Strongly Agree" and "Agree" as the attitude of agree, a chi-square test was conducted for the two questions listed above and the results showed students' distribution of attitudes significantly changed over the semester.

## What instructors said about their experiences fostering group work:

Instructor	Professional Experience	Quotes about participation	Quotes about identity
Instructor 1	Adjunct instructor with 9 years of postsecondary instruction experience and no studio style instruction experience	"I walk around, and I check to make sure that everybody has roughly the same data, you know, they're getting what I expect for the data."	"I don't know if this is the right way of saying. I don't think race and gender have much to do with, you know, how to do the labs." And later: "Skills tend to be helpful if they can kind of steer groups that are, you know, have the same language abilities, or say, similar language skills together that, you know, that seems to help each other out."
Instructor 2	Teaching assistant professor with 7 years of postsecondary instruction experience and 5 years of studio style instruction experience	"Half of the students seem engaged... the other half, I think they are very low in energy... regardless of what we do, I still find it every hard to, you know, get them motivated."	"I would like to have my students feel like, it is an inclusive environment... That's why I am going around in tables, talking to everyone of them as much as possible. I tried to make them feel like, you know, I care about every one of you equally"
Instructor 3	Teaching associate professor with 10 years of postsecondary instruction experience and 6 years of studio style instruction experience	"I can't quite pinpoint one activity that is spectacularly bad. But I do feel many of the tutorials [group work problems], the collaborative aspect of the tutorials is not super-efficient." And later: "The other thing I notice too is because there's no real structure to the tutorials and how group activities unfold... I feel like the students when they're self-managing for that long stretch of time, it becomes ineffective after awhile."	"I try to encourage them to work collaboratively. I'd like to, mention to them, even the community building aspect. I try to mention to them it is an important skill that is transferable to your career"

## Take-aways:

### The mismatch between students and instructors:

- At the beginning of the semester, many students wanted to be able to ask instructor(s) questions during the group work session and requested a mechanism to guarantee equal group participation among all group members.
- All three instructors in our study reported walking around the classroom and interacting with students.
- However, very few student participants in the post-survey agreed that they feel like the instructor(s) and TA(s) provided adequate support for students to engage in group work effectively and inclusively.

**The next step:** Both students and instructors were unsatisfied with the current group work instructional practices. Additional effort must be incorporated into these physics courses to improve the efficiency and inclusivity of group work in studio physics courses.

## Acknowledgement

The project was supported by University of Connecticut College of Liberal Arts and Sciences Scholarship of Teaching and Learning Grant.

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