

# HOW INTERACTIVE WORKSHOPS SHAPE WOMEN AND NON-BINARY STUDENTS' SENSE OF BELONGING IN PHYSICS

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## SENSE OF BELONGING IS A PREDICTOR OF RETENTION IN STEM MAJORS

Researchers have identified students' sense of belonging as an important factor in whether or not they persist in STEM majors (Rainey et al., 2018), yet women can report lower senses of belonging than men in their classes (Lewis et al., 2016).

## A MIXED-METHOD STUDY OF STUDENTS' RETENTION IN PHYSICS

At Monash University, we have begun a longitudinal, mixed-methods study of students' experience in physics and astrophysics major units. In semester 1, 2023, students in our first-semester unit in the physics major sequence completed pre and post surveys addressing sense of belonging alongside other measures linked to retention (including physics identity, self-efficacy, and demographic factors). Among students responding to the first survey, 23.2% identified as women, 72.1% as men, and 4.7% as non-binary and other gender identities (response rate was 79% of enrolled students, students could identify as more than one gender and did not have to select a gender). 16 students participated in two interviews, one near the beginning of the semester and one near the end. Of these, eleven did not identify as men, including seven who identified as women and four who identified as non-binary or genderfluid. In the second interview, participants were asked about their sense of belonging in the interactive physics workshops and labs.

## WOMEN AND NON-BINARY STUDENTS REPORT WORKING WITH OTHER NON-MALE STUDENTS IS ASSOCIATED WITH FEELINGS OF BELONGING

In interviews, most women and non-binary students reported they felt like they belonged and were welcomed by their peers. Furthermore, most described opting to sit at tables with mostly other women and non-binary people when the choice was available. Multiple students cited greater comfort in sharing their ideas and expressing uncertainty when in discussion with other "non-men." This was true both among students who attended all-girls high schools and those who attended co-educational high schools. At the time of abstract submission, survey analysis was ongoing.

## INTERACTIVE SETTINGS WHERE STUDENTS SELF-SELECT GROUPS MAY SUPPORT WOMEN AND NON-BINARY STUDENTS' BELONGING IN PHYSICS

The streams of this unit were large enough (70-100 students each) that there were substantial numbers of women and at least two non-binary students in all sections. These initial results suggest that interactive instructional settings where students can self-select their groups may support sense of belonging among gender minorities in physics, including women and non-binary people.

## REFERENCES

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