

# Belonging in General Chemistry: What Works for Students

## Authors

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### Research Question

#### WHAT?

It has been well-documented that belonging in the classroom is crucial for student success and persistence. To understand how important a sense of belonging was for grades and class outcomes. We were also interested in understanding what students valued the most when it came to feeling sense of belonging in the general chemistry course.

### Methods/Research Tools

To answer our research question, we drafted a survey, which was then peer reviewed, and entered it into Qualtrics, which was then distributed to CHM 103 students before their discussion classes. Qualtrics recorded the data, and after the semester was finished and grades were finalized, the results were analyzed. We also interviewed students who were retaking CHM 103 with Dr. Turov this semester, and asked them about their past CHM 103 experience, how it has changed by having Dr. Turov as their professor, and what their main takeaways have been.

### Student Reactions to Belonging Interventions

"Getting to know the professor definitely allowed me to enjoy the class more, as a person of color in lab it is sometimes daunting to have to work with people who don't share similar identities as me and I oftentimes feel ignored but having a good relationship with the professor allows me to want to continue working for this course."

"Overall this class is structured to aid students to feel welcome in the classroom environment. Whether it is the extra credit points that ask about our personal life or the one on one meetings, it feels as though Dr. T cares for her students individually. Additionally by finding new people to sit by and being assigned partners in discussion, you are able to meet others with similar interests as yourself."

"The required meeting with my instructor where I got the chance to talk to them outside of class without expectations about an assignment or anything else made me feel much more connected to the instructor. Also, things within lecture are often brought full circle in the form of small in-class jokes that make me feel like I belong."

"The one on one meetings were very helpful in making me feel like a true piece of the classroom environment. Also, while I was somewhat opposed at first, the "team quizzes" helped me to find a really kind friend and now I look forward to chem for another reason, increasing my sense of belonging within the student environment!"

"I think having the individual meetings was very helpful to get to know her and for her to get to know us. Also her knowing everyone's name and actually genuinely caring about us makes it very easy to feel a sense of belonging in this class."

### Belonging Survey and Ranking Question

#### Initial Survey (at beginning of the semester)

The following questions were presented to students using a Likert scale:

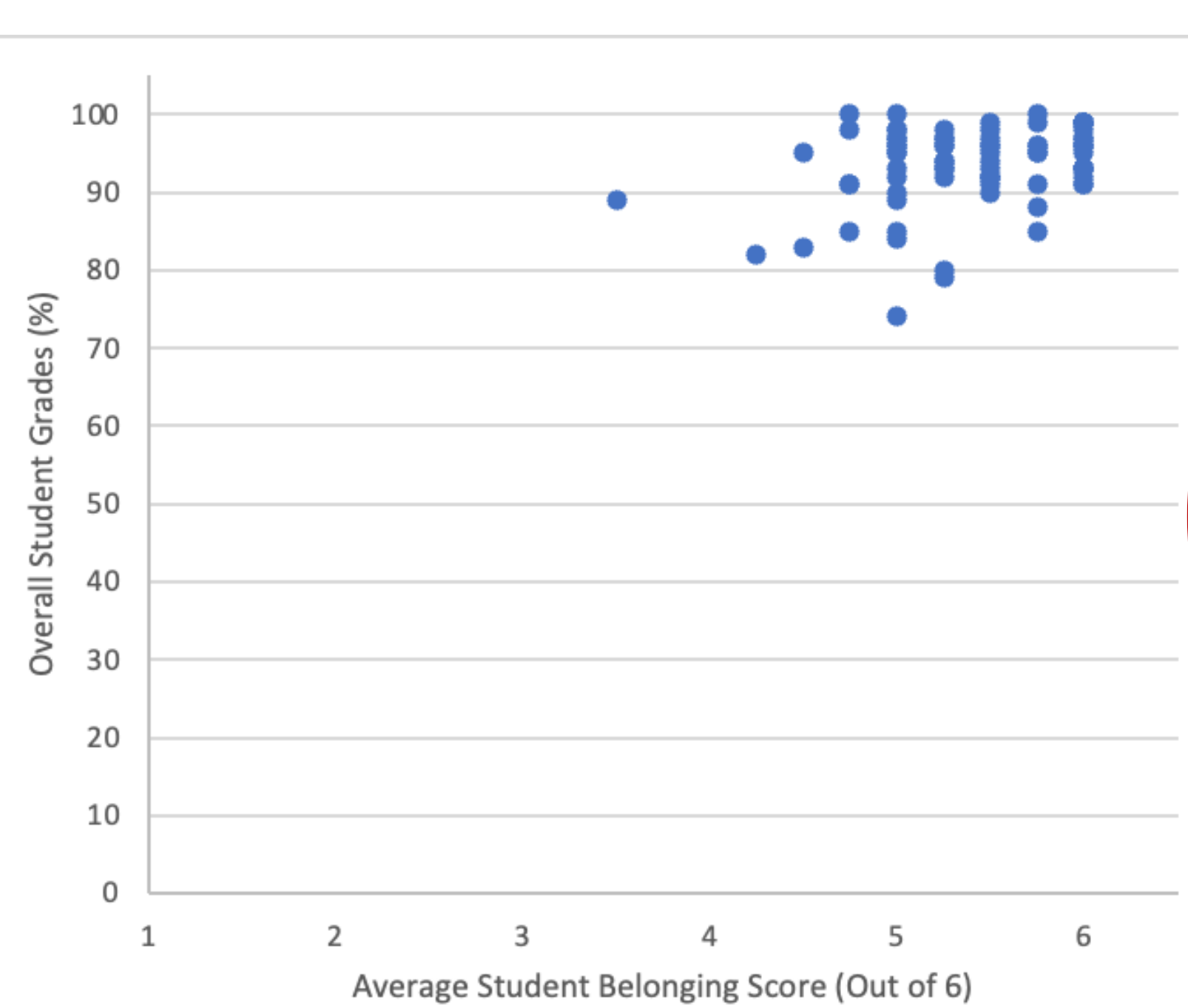
1 = strongly disagree    2 = disagree  
3 = mildly disagree    4 = mildly agree  
5 = agree    6 = strongly agree

1. I feel like I fit in the General Chemistry course.
2. I feel comfortable with my peers and classmates in the General Chemistry course.
3. I feel comfortable with my instructor in the General Chemistry course.
4. Setting aside my performance in class, I feel like I belong in the General Chemistry course.

#### Follow-up Survey (at end of the semester)

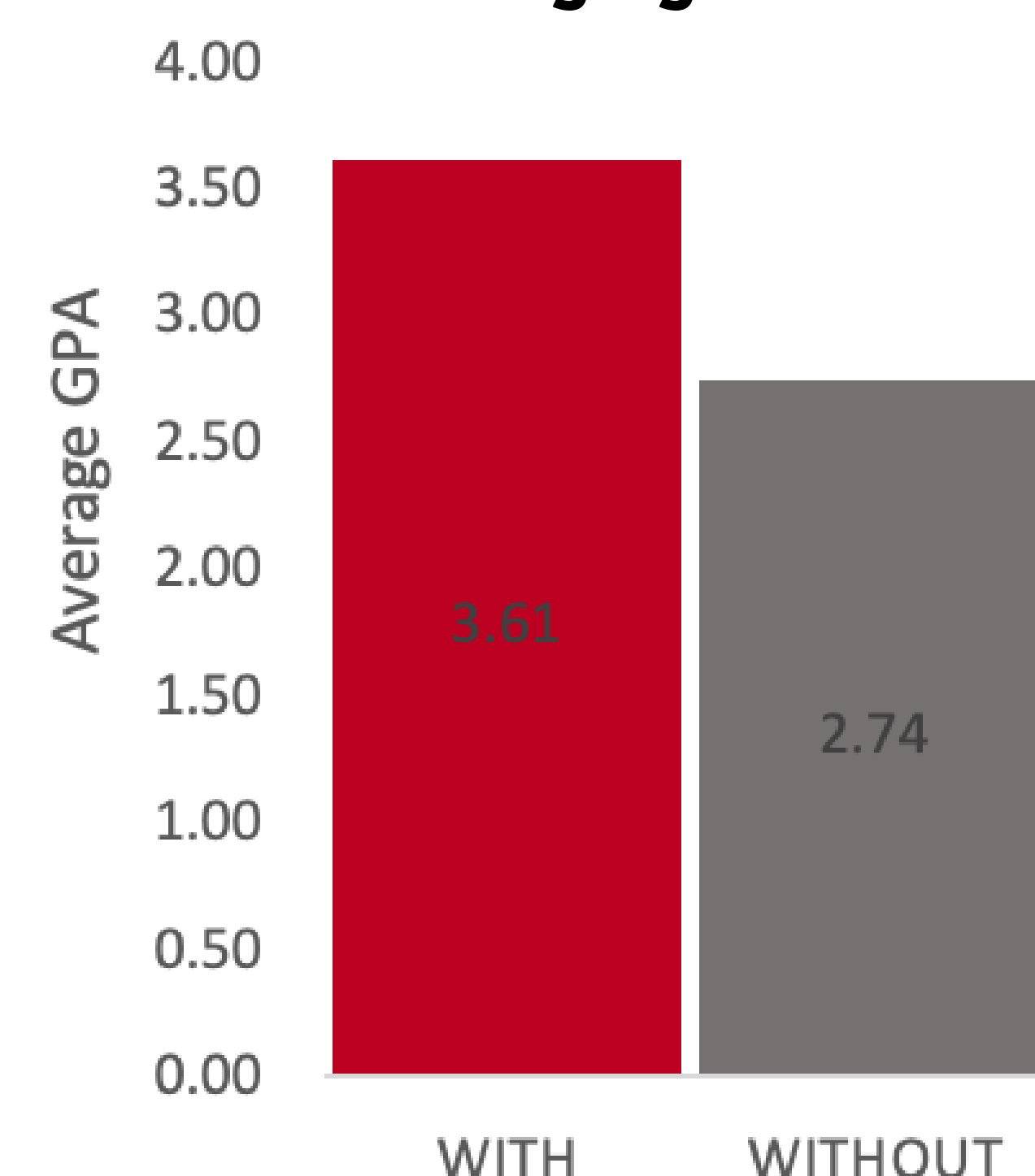
- Used the same belonging scale
- Added questions to help students rank belonging interventions based on the student's indicated impact
- Questions:
  - Is there a particular activity, experience, etc. that helped you feel a sense of belonging in this course? (free-response, then ranking)
  - Can you suggest ways your sense of belonging could be improved in this course? (free-response then ranking)

### What does the data say?



**Student assessment outcomes (unsurprisingly) correlate with a high sense of belonging!**

### CHM 104 GPA Comparison Based on Belonging Interventions



### Key Takeaways

As we can see from the data:

- Belonging interventions improve student GPA by almost one FULL point.
- Most impactful interventions:
  - 1:1 meetings with the professor
  - instructor belief in student ability
  - instructor approachability
  - knowing students by name
  - working collaboratively in groups
- Why does it work?
  - Having a sense of belonging makes it easier for students to persist when faced with obstacles or challenges.

### More Belonging Ideas/Future Work

In what ways could your sense of belonging be improved in this class?

1. providing more "real-life" applications of material
2. more opportunities for reflection on performance
3. instructor sharing personal challenges with course material and ways she overcame the struggles
4. different group assignments (beyond group quizzes)
5. more "get to know you" group activities