Resonating Feedback: The impact of feedback cycles on students' sense of belonging in an 8th grade biology classroom

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Do I belong here?

In middle school, students are constantly asking themselves this question. Though student identity is developing in many ways, adolescents' relationship to science, technology, engineering, and mathematics (STEM) fields reaches a crucial point during the middle school years. This research aimed to investigate whether or not regular feedback sessions about classroom procedures and rituals helped increase students' feeling of belonging in an eighth grade human biology classroom.

Research Questions

Primary research question:

How does practicing regular feedback cycles in whole-class discussions impact students' sense of belonging in an eighth grade human biology classroom?

- How does participation in and response to feedback discussions change students' self-reported sense of belonging?
- How does students' self-reported sense of belonging affect participation in academic discussions and their perceptions of feedback and grades?
- What strategies will students identify to create a more welcoming classroom and increase their sense of belonging?

3 Focus questions

Student data included a Likert survey, classroom participation, and perceived vs. real grades. Data were also collected on students' ideas about improving the classroom atmosphere to be more welcoming.

Sense of belonging Likert-style survey questions:

Teacher influence	Student influence	Ability/impostor syndrome	General belonging
• When we learn about examples in this class, they are related to my life. • My teacher makes me feel comfortable in the classroom space.	• Most students in this classroom accept me for who I am. • Other students make me feel comfortable in the classroom space.	• Other students have an easier time learning science than I do.* • I have an easy time completing work for this class at a strong level. • The feedback and grades I receive match the effort I put into my assignments in this class.	• I can be myself in science class. • I feel like I am a part of making this classroom what it is. • The things we learn in this class are important to me. • The things we learn in this class are interesting to me. • I am excited about studying science in high school and beyond.



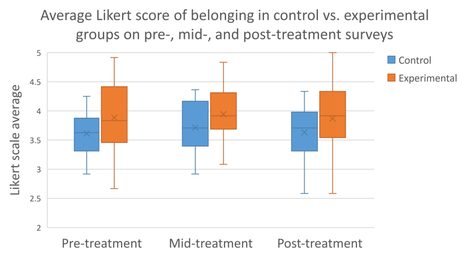




Student Subjects

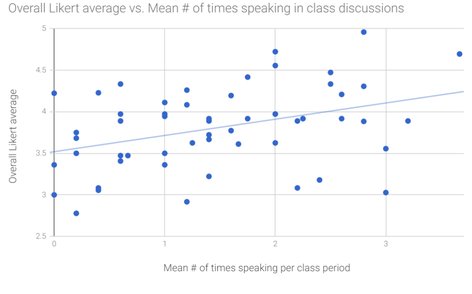
Seattle Academy is an independent school that serves grades 6-12. This research followed 55 eighth grade students in the fall trimester of 2017. These students were 58% boys, 40% girls, and 2% nonbinary identified. White students made up 71% of the study group; 18% identified as a racial/ethnic group underrepresented in STEM.

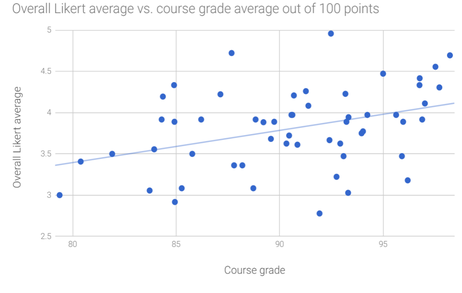
Results



Student group	Questions scored higher on than other students
Girls	• The things we learn in this class are interesting to me. • When we learn about examples in this class, they are related to my life. • The feedback and grades I receive match the effort I put into my assignments in this class. • I am excited about studying science in high school and beyond.
Boys	• I can be myself in science class. • Other students have an easier time learning science than I do. • Other students make me feel comfortable in the classroom space.
White students	All questions except: Other students have an easier time learning science than I do.

Average Likert scores did not increase over the treatment with the experimental group (*N*=34) compared with the control group (*N*=21). However, the experimental group had higher scores overall throughout the trimester. Certain demographic groups scored higher on Likert items than others, though no statistically significant difference between groups was measured.

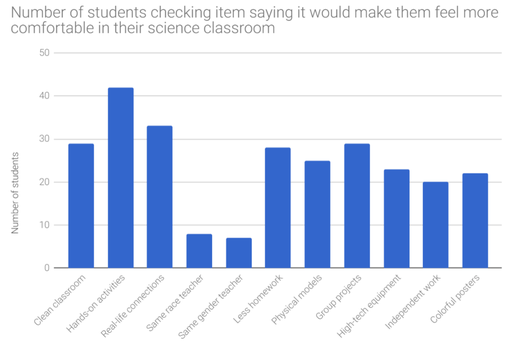




Both mean number of times participating in the classroom and course grade had a positive, non-significant correlation with students' Likert averages. R^2 for participation=0.143, *N*=55; R^2 for course grade=0.143, *N*=47.

Student-generated ideas

Things my teacher does that increase belonging	Things my teacher does that reduce belonging	Changes desired in classroom community
Answers questions (*N*=14) High energy/positive (*N*=11) Hands-on learning, interactive teaching (*N*=9) Detailed lessons (*N*=6)	Speaks too quickly (*N*=6) Too much homework (*N*=4) Emotional/sarcastic communication style (*N*=3)	Decrease disruptive behavior of other students (*N*=10)



Most students reported feeling comfortable in their current classroom. The primary desired change in classroom culture was a decrease in loud and disruptive peer behavior.

Conclusions

Feedback cycles did not have a statistically significant impact on students sense of belonging. Classroom culture and interactive rituals co-created with students did improve students' sense of belonging over time. There was a slight positive relationship between achievement and classroom participation and students' sense of belonging in the classroom. Students' primary descriptors of a welcoming classroom include a teacher who answers questions, provides opportunities for hands-on learning, and prevents disciplinary issues from distracting from the task at hand.

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