

Make it Make Sense: Mathematics in Undergraduate Biology

Abstract:

As a language of science, mathematics is key to understanding past discoveries and making new ones. However, science students have difficulty applying quantitative skills to novel and complex problems. Students experience greater success when they engage in blended sensemaking and make connections between mathematical expressions and the represented scientific phenomena. Students who perceive these connections are more likely to submit a solution to a problem and engage in multiple problem-solving pathways. Our research has focused on the role of the task, the instructor, and the student in fostering blended sensemaking during instruction of mathematics in undergraduate biology classrooms. Qualitative analysis of student talk in small groups while working on mathematical tasks in biology has generated insights on the role of the task in eliciting blended sensemaking and on the role of student talk in the formation of connections between mathematical equations and the scientific phenomenon. The theoretical implications for student blended sensemaking will be discussed in light of opportunities for cross-disciplinary research. The implications for designing and implementing curriculum involving mathematical equations in science classes will be addressed.