



BIOLOGY EDUCATION  
RESEARCHER CANDIDATE

# Dr. Qi Cui

Innovating Graduate and  
Undergraduate Education

## ABSTRACT

In order to respond to the urgent calls for graduate and undergraduate STEM education reform, this research investigates the knowledge and skills necessary for chemists' careers, faculty members' conceptions of teaching, and the influence of faculty discussions within the biology department on instructional practices in STEM education. Through a series of studies, the research uncovers the significance of 21st-century skills beyond technical knowledge for scientists across various job sectors, with implications for graduate education reform. A mixed-methods approach is employed to examine the relationship between faculty conceptions of teaching and instructional practices, revealing the impact of student-centered approaches on students' cognitive learning gains. Additionally, the research explores the role of departmental teaching discussion networks in shaping faculty members' teaching philosophy and strategies. The findings highlight the importance of broadening learning goals in graduate school, promoting changes in faculty conceptions of teaching, and leveraging influential faculty members for effective STEM education reform.

Thursday, April 13, 2023 - 11:10am  
404D Biological Sciences Building