



**College of Liberal Arts and Sciences
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Supporting students' chemistry self-efficacy: Why does it matter?

Abstract:

Students' retention in STEM-related careers is of great concern for educators and researchers, especially the retention of underrepresented groups such as females, Hispanics, and Blacks in these careers. Therefore, it is essential to study factors that could potentially influence students' decision to stay in STEM. According to the Social Cognitive Theory, for students to be successful and persist in STEM-related careers, a strong sense of self-efficacy is necessary. Chemistry self-efficacy (CSE) has been defined as a student's beliefs about his or her own capability to perform a given chemistry task. There are four sources that will influence the level of self-efficacy: mastering experiences, social persuasion, vicarious experiences, and psychological states. We have explored students' CSE in introductory and general chemistry settings with a diverse population, including students from underrepresented minority groups. We investigated CSE across the semester and how the different sources shaped students' confidence. Also, we explored the relationship between students' CSE beliefs, classroom teaching, deep learning strategies, and performance. Our study involves both quantitative and qualitative methods to understand these relationships. Data from surveys and interviews have been gathered, and the analysis suggests a strong relationship with performance and with the classroom environment. Being aware of students' diverse needs will help us to understand some of the challenges that students face in the chemistry classroom. Understanding some of these challenges will help instructors be more prepared for teaching.