Portland State
Chemistry

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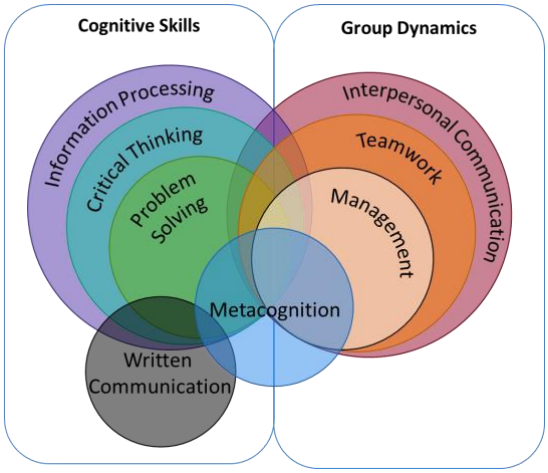
Promoting Student Engagement in Active Learning Environments: Characterizing Task Design and Implementation



In the past decade there has been increased emphasis on research-based instructional practices in the STEM fields, specifically in terms of student-centered active learning approaches. Much of this drive for pedagogical change has come from the numerous publications on the positive impact active learning environments have on student populations in large introductory courses as well as on students who are underrepresented in the STEM fields. However, less research has been done on how students engage in these learning environments. Our group is working to characterize the essential features of effective task design and implementation that foster productive engagement of diverse students in discourse practices known to promote meaningful learning in different active learning environments. Initial analysis has been done on the nature of interactions occurring between students in small group discussion formatted courses along with an analysis of the activities worked on by students as well as the facilitation of activities by instructors and graduate teaching assistants. Results of this initial analysis suggest features of effective task design, but also indicate that effective design is not enough to foster students' construction of scientific knowledge and meaningful learning, and that instructor facilitation and group dynamics play a major role.

Bio: Renée Cole is a Professor of Chemistry at the University of Iowa. Dr. Cole earned a B.A. in chemistry from Hendrix College, and M.S. and Ph.D. degrees in physical chemistry from the University of Oklahoma before completing a post-doctoral fellowship in chemistry education at the University of Wisconsin. Her research focuses on issues related to how students learn chemistry and how that guides the design of instructional materials and teaching strategies as well on efforts related to faculty development and the connection between chemistry education research and the practice of teaching. She has been a co-editor for two books focusing on chemistry education research as well as a PI for Increase the Impact, a project to support propagation of educational innovations. She is a Fellow of the American Chemical Society (2015) and AAAS (2022) and was named as a CLAS Collegiate Scholar in 2018. Her achievements have also been recognized through several awards, including the University of Iowa CLAS Collegiate Teaching Award (2021), the Iowa Women of Innovation Award for Academic Innovation & Leadership (2014), the University of Central Missouri College of Science & Technology Award for Excellence in Teaching (2010), and the Missouri Governor's Award for Excellence in Education (2009).