

A Closer Look at Research Clusters

SCIENCE AND MATH EDUCATION AND LEARNING RESEARCH

Overview	The goal of science and math education and learning research is to investigate teaching and learning materials and methods and to apply findings to the improvement of curriculum, instruction, and learning in schools and universities. Research activities include: empirical classroom research that tests the effectiveness of learning technologies; behavioral and cognitive neuroscience methods (such as fMRI) to understand how students read, think about data, or solve complex problems; developing computational models to explain how the brain perceives language; testing the value of informal learning environments such as playgrounds or museums; and assessment and evaluation methodologies and research.
Focus of Research at UMass Boston	<ul style="list-style-type: none">• Advanced problem-based learning, assessment and evaluation• Curriculum and instructional materials development – Active Physics and Active Chemistry• Information technology skills and workforce development - BATEC• Achievement gap of urban youth• Science and math education research involving quantitative and qualitative studies of student learning• Processes behind early childhood thinking and learning• Learning experiences for children with chronic illnesses and disabilities
UMass Boston Departments Involved	Biology, Chemistry, EOS (College of Science and Math); Curriculum and Instruction, Counseling and School Psychology, Center of Science and Mathematics in Context (Graduate College of Education); BATEC (Boston-area Advanced Technological Education Center), Psychology
Collaborations Established and Potential	Broad existing efforts including COSMIC national partners; Urban Massachusetts Louis Stokes Alliance for Minority Participation; Roxbury-Bunker Hill-UMass Boston Bridges to the Baccalaureate; Boston Science Partnership (Boston Public Schools, Northeastern University); Watershed-Integrated Sciences Partnership (Boston, Dedham, Milton Public Schools); COSEE-New England (New England Aquarium, Woods Hole Oceanographic Institute). Potential in future to expand local, national and international collaborations.
Distinctive UMass Boston Approach	<ul style="list-style-type: none">• Build on reputation of faculty having significant content strength• Draw on strengths of psychology and behavioral sciences groups to understand how students learn• Test the effectiveness of scientific instructional materials and methods through established regional partnerships• Teacher professional development• Transnational orientation, including international work