

## The Maine Center for Research in STEM Education

November 3 Colloquium – Grant Williams, School of Education, St. Thomas University

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*Maine Center for Research in STEM Education (RiSE Center)  
Colloquia & Seminar Series*

**Grant Williams  
School of Education, St. Thomas University  
Fredericton, New Brunswick, Canada**

### **Kinulations: Fostering K-12 Students' Understanding of Science Concepts through Participation in Kinesthetic Simulations**

Research on the use of *simulations* in science education indicates that students can develop deep conceptual understanding as a result of interacting with dynamic visual representations of concepts and phenomena that may be difficult to experience first-hand. The majority of these simulations currently exist in animated or computer generated video formats for student viewing. Research on movement education also tells us that students can develop deep and lasting conceptual understanding as a result of participating in *kinesthetic activity* while learning new concepts. My current program of research explores the combination of these two pedagogical approaches in the development and testing of the impact of a collection of what I call Kinulations (kinesthetic simulations) on students' conceptual understanding of a variety of science concepts. Simply described, Kinulations are movement-based learning activities in which students take on the roles of key elements of natural systems in order to act out or kinesthetically simulate particular scientific phenomena. My hypothesis is that participation in such physically-engaging student-centered simulations may foster a depth of conceptual understanding that traditional didactic science instruction cannot. In this talk I will discuss the theoretical framework of the research and share video samples of some of the Kinulations trials in K-12 science classrooms.

Bio: Dr. Grant Williams is an Assistant Professor in the School of Education at St. Thomas University, where he teaches courses in secondary science and math education to pre-service teachers. He completed a bachelor's degree in physics and mathematics at Mount Allison University, bachelor's and master's degrees in education at the University of New Brunswick, and an Ed.D. at the University of Massachusetts Amherst in science, math, and technology education.

**Monday, November 3, 2014  
3:00 – 4:00 pm  
Arthur St. John Hill Auditorium, 165 Barrows Hall**

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