

# RITES: THE ROAD TO RHODE ISLAND STUDENT ACHIEVEMENT AND SUCCESS IN SCIENCE



## STUDENT SUCCESS

**Student Success** is a very broad construct that only has meaning when defined contextually. The contexts that the RITES partnership has chosen are: the science classroom and choice of STEM careers. RITES has focused on the following three criteria to measure success in these contexts.

### Success means greater student achievement

*Achievement* can be measured by improvement on NECAP and other standardized tests; by improved retention and engagement; and by higher graduation rates.

*Mastery* of skills and content can be measured by formative and informal assessments within the classroom.

### Success means more motivation and engagement

Are students excited by, and engaged in, STEM activities in the classroom?

### Success means more STEM career choices

Increased commitment to STEM careers will be measured by changes in the patterns of enrollment in STEM programs in higher education institutions from RITES schools.

RITES believes the most authentic and accurate measures of student success come when classroom teachers measure the success of their students, individually and in one class at a time. The RITES project design facilitates the use of the classroom teacher as the primary vehicle for collecting data on how well students **master** the skills and content covered in class and how **engaged and enthused** their students are.

## CHALLENGES AND SOLUTIONS

CHALLENGE	SOLUTION
Teacher buy-in and long-term commitment to RITES innovations.	To encourage ownership of RITES innovations, RITES developed the following to involve more teachers in leadership roles: <ul style="list-style-type: none"> <li>▪ K-12 School Council</li> <li>▪ Resource Teams</li> </ul>
Teachers initially perceived teacher reflection as an unimportant component in eventual student achievement	RITES designed "The Artifact" as a vehicle through which teachers reflect on the teaching and learning that occurs in their classrooms. The Artifact encourages teachers to: <ul style="list-style-type: none"> <li>▪ Ask critical questions</li> <li>▪ Collect classroom data</li> <li>▪ Organize and analyze the above information to strengthen teacher practice and deepen student understanding</li> </ul>
Overcome the obstacle of historically low performance by under-represented populations	RITES is establishing a Diversity Program at URI designed to: <ul style="list-style-type: none"> <li>▪ Mentor students from middle school to high school and the first year of higher education to encourage an education in STEM disciplines</li> <li>▪ Provide high school student internships at URI focused on student success</li> <li>▪ Develop a culture change that highlights student involvement in science education and directs them as they enter the workforce</li> <li>▪ Develop an Academic Roadmap geared to informing students about careers in science and science education</li> </ul>
Teachers need to be trained and mentored on how to collect classroom data and then use it effectively to inform their instruction	RITES provides guidance for teachers via the following: <ul style="list-style-type: none"> <li>▪ The teacher newsletter</li> <li>▪ The school council</li> <li>▪ The addition to the RITES staff of a STEM liaison, whose tasks include to work with teachers on the collection of classroom data</li> </ul>

## RESEARCH DESIGN

RITES attempts to effect change in the Rhode Island community by providing supplemental materials and learning techniques to teachers that enable them to better engage students in a classroom environment and foster an understanding of and passion for science. Its mandate is not to change curricula or performance standards, but to improve them.

To know if RITES has had an impact on student success, we:

- Collect data - by RITES staff, faculty and evaluators - on student performance that is class-specific to identify improvement in STEM performance.
- Collect data from RITES teachers through self-reporting, formative and summative surveys, creation of artifacts, and other teacher-defined products.
- Examine how teachers are using RITES Investigations and what successes and struggles they encountered while implementing the new technology.
- Analyze RITES short courses to determine what professional development strategies teachers find most valuable for becoming more comfortable with science content and facilitating classroom inquiry.

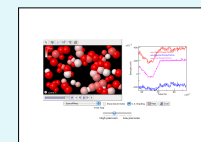
## RITES in Action



Students measure the build-up and release of force to simulate the forces causing earthquakes



Exploring conclusions in the field



Molecular dynamics simulation

## RITES PARTNERS

The **Rhode Island Department of Education (RIDE)** is dedicated to ensuring that all Rhode Island students are ready for success in college, careers, and life. Specific to RITES, RIDE measures success of this commitment by realizing an increased graduation rate; improvement in student achievement in science by 2012 and 2015; and a coordinated review, development, and monitoring systems for rigorous curricula in science. RIDE provides technical, statistical, and logistical input to RITES and will assist in the development of investigations that align to standards; assessments that measure student learning; and identification of potential participating LEAs and teacher leaders to provide sustainability to the program beyond the scope of NSF funding.

The **Education Alliance at Brown University** describes their efforts in the abstract listed below (Laorenza et al, this meeting)

Software created by the **Concord Consortium** provides the framework for collection of much of our data on student success.

**Alicia Storey, Co-PI, Assistant Superintendent of Westerly Public School District** is facilitator of the School Council

## ABSTRACTS OF RITES PRESENTATIONS AT THIS MEETING

*Evaluating Short-Term Impacts on Student Achievement: What Does Student Motivation and Reflection Tell Us?* By Elise Arruda Laorenza, Stephanie Feger, and Joye Whitney

*A Value-Added Approach to Program Implementation: Using School Factors and Student Achievement to Guide the Implementation of Partnership-Based Reforms* By Stephen Brand, Jay Fogleman, David Byrd, and Dan Murray (PI)