

## *STEMming The Tide of Science Dropouts*



## *The SMILE Program Annual Report 2010-2011*

[www.uri.edu/smile](http://www.uri.edu/smile)



SMILE High School Students at the 2011 Biotechnology Engineering Challenge Weekend  
Amgen Learning Laboratory at the University of Rhode Island

## Table of Contents

Letter from the Director. . . . .	3
Our Reach . . . . .	4
Highlights . . . . .	5
Demographics . . . . .	6
More Highlights . . . . .	7
Our Events . . . . .	8
Outcomes . . . . .	9
Continuation Rates . . . . .	10
Sponsors and Partners . . . . .	10
Success Stories . . . . .	11



**To our partners, supporters, mentors, and friends,**

**The SMILE Program IS STEMming the Tide of Science Dropouts.**

The SMILE Program has had another very successful year serving over 282 underrepresented students in seven school districts and 35 teachers. The number of our SMILE graduating seniors is at an all-time high of 29. We know that our after school STEM academic program has had a positive impact on our students. 28 SMILE seniors have been accepted into colleges and 21 or 75% of those students are majoring in STEM disciplines.

**How does The SMILE Program Stem the Tide of Science Dropouts? Interest them early in science and math, develop a peer group where it is “cool to be smart”, do experiential activities, provide career oriented field trips, and have high academic expectations.**

The SMILE Program interests students in science and math at an early age, grades 4-5, and continues through the impressionable middle school years, and high school. The curriculum, by our design, includes exciting themes such as Ocean Exploration, Biotechnology, Wind Turbines, Bridge building, Transportation, Remotely Operated Underwater Vehicles (ROVs), Physics unraveled, and Environmental Stewardship. Our Teachers Professional Workshops provide SMILE leaders with hands-on curriculum which they learn through workshop activities and bring back to their students. Teachers use some of these hands-on activities with their regular classes and share the activities with colleagues.

**Statistics Highlights!!** (A work in progress- missing student data is being retrieved to update the analysis.)

The SMILE Program began a statistical analysis of its data base that goes back to 1994. With the assistance of the University of Rhode Island, Office of Institutional Research, we were able to determine the number of SMILE alumni who graduated high school and attended URI, their majors, number of years they were in SMILE, and the levels that had the greatest impact on college attendance and selection of STEM majors. Data is still coming in however, this is what we have learned thus far:

- At URI currently, there are 54 SMILE alumni and **74% are in STEM majors.**
- Multi-level participation at middle and high school levels is more likely to result in college enrollment.
- SMILE student college enrollment is 52% compared to the RI Low Income College Participation rate of 30%.
- 61% of SMILE students enrolled in college are female; 39% are male (reflects SMILE club membership).

**Mentors make a difference!**


We continue to involve our corporate partners as mentors in our Annual Challenges. They motivate SMILE students as well as URI mentors. Employees of Amgen, Toray Plastics, America, and Schneider Electric have participated through their company's community outreach programs. This gives students an added dimension of career exploration in our high school biotechnology and middle school bridge building projects. We also have a partnership with the URI Center for Student Leadership which involves undergraduates in a variety of college majors as SMILE mentors.

**Path Forward**

Your support of The SMILE Program is helping to reverse the trend in the U.S. of fewer science and engineering undergraduates (15% of all undergraduates) compared to other countries where the graduation rate in S&E is increasing: South Korea is at 38%, France is at 47%, China at 50%, and Singapore 67%. (Sevo,Ruta (2009) The Talent Crisis in Science and Engineering. Apply Research to Practice (ARP) Resources <http://www.engr.psu.edu/AWE/ARPResources>). We will continue to seek out additional funding opportunities so that more students will be able to have SMILE experiences. Together, we are making a world of difference to our students, teachers, and the future U.S. work force.

Thank you for all your efforts on behalf of all our SMILE students and teachers.

Sincerely,

  
Carol Englander

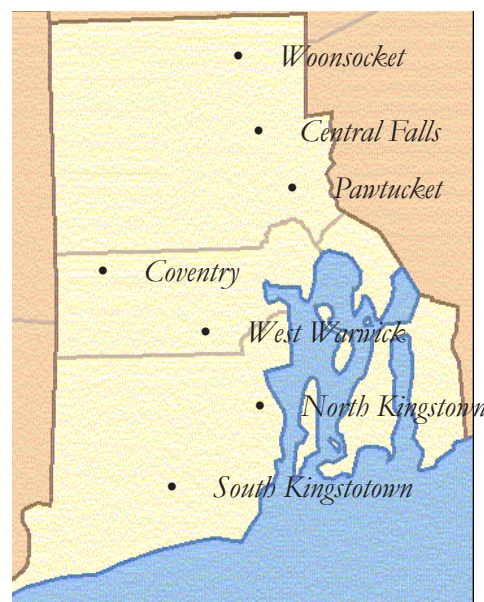
## LETTER FROM THE DIRECTOR



Director Englander presents writing award to a SMILE student at the Elementary Outdoor Science Adventure

## OUR REACH

- This year, The SMILE Program served 282 students in 16 schools across Rhode Island. Clubs are held directly on school sites to provide a strong link to the regular school day, are run by dedicated SMILE teachers, who are also teachers during the school day, and offer a high quality and hands-on science, technology, engineering, and math (STEM) academic enrichment experiences. Coventry High School took part in SMILE from January 4th through April 2nd when we did the biotechnology portion of our curriculum. They also attended the High School Challenge Weekend. North Kingstown and Shea (Pawtucket) High Schools participated as full SMILE clubs this year.



## Students Served by School District

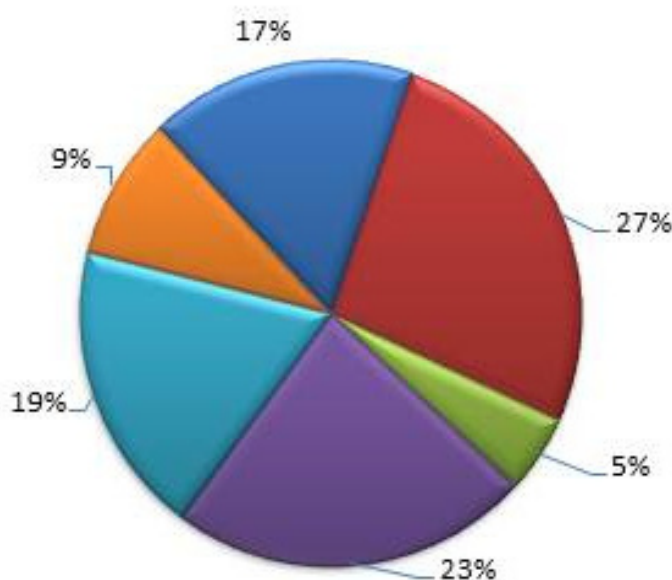


Table 1.  
PARTICIPATING STUDENTS

	Central Falls	W. Warwick	Pawtucket	Woonsocket	S. Kingstown	N. Kingstown	Coventry
Elementary	22	22		19	20		
Middle	9	27		26	20	14	
High School	14	21	13	16	9	10	20
Total	45	70	13	61	49	24	20





### Teachers Professional Development

SMILE teachers in the 3-D animation lab learning how chemicals interact in three dimensions

## HIGHLIGHTS



### Teachers Professional Development

Patricia Steere from Steere Engineering presented the IWAY Bridge Design and Construction to SMILE Teachers



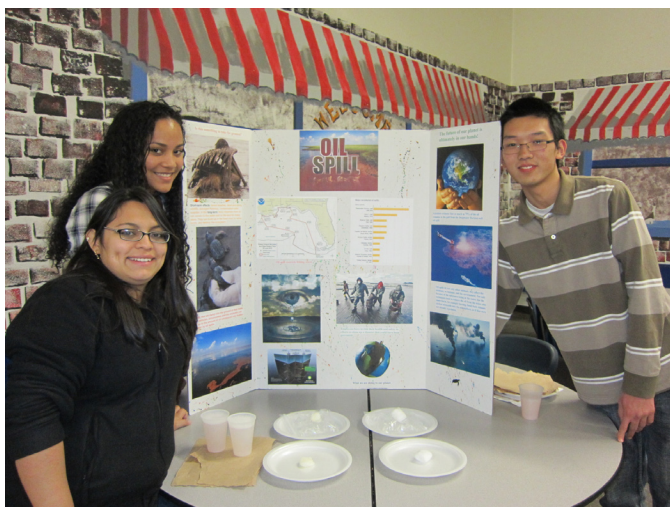
### Teachers Professional Development

3D DNA printed structure, new technology in Dr. Cho's URI Lab during the January Teachers Professional Development Workshop



### SMILE Club Meetings

Providing academic hands on enrichment and an engaging environment that motivates students to improve academically.



### Family Science Nights

SMILE Students present hands-on science based learning to their families and community at district wide Family Science Nights.



### Challenge Weekends

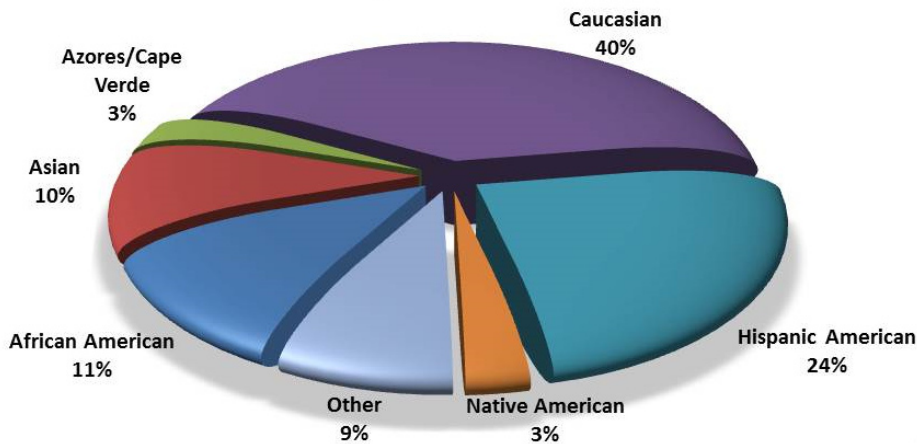
Intrepid explorers find egg masses during 2011 Elementary Outdoor Science Adventure (EOSA)

## MISSION

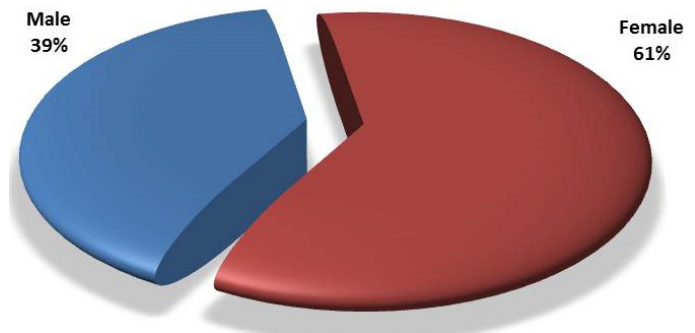
The SMILE Program seeks to improve the educational outcomes of underrepresented and underserved students by giving them confidence in their academics and life skills in order to pursue higher education and career opportunities of their choice. Our work supports the University of Rhode Island's initiatives to achieve the enrollment of a talented and diverse community of students, as well as increase first-year retention of freshmen by focusing on college preparedness of underserved pre-college students who are in grades 4 – 12. With a dedicated team of SMILE staff members, club teachers/leaders, school administrators, college faculty, graduate and undergraduate students, and community members, The SMILE Program experienced another successful year.

## DEMOGRAPHICS

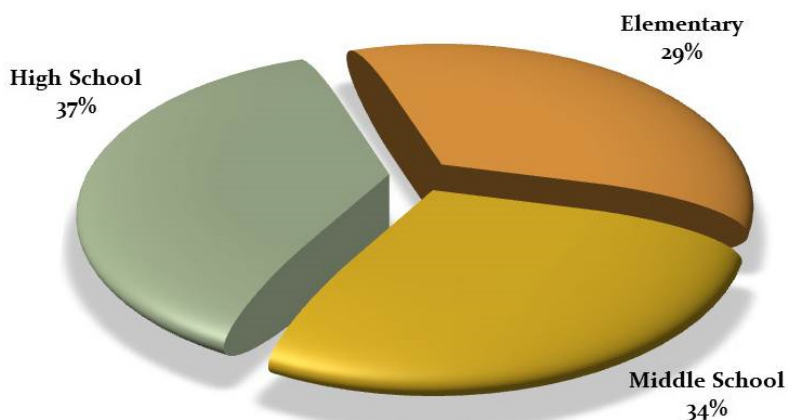
**Ethnicity**



**Gender**



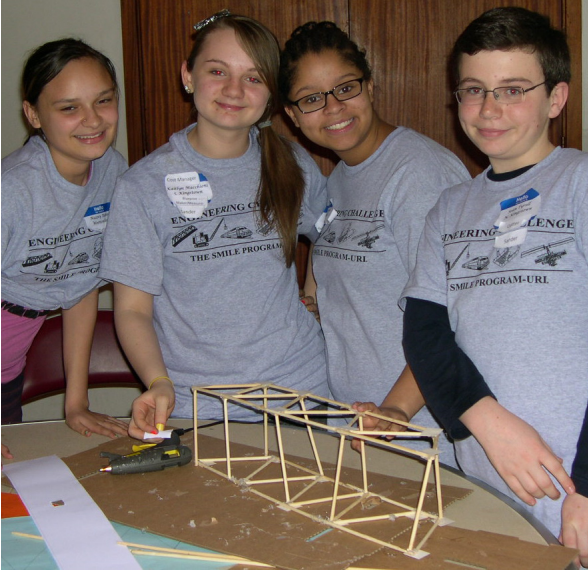
**Grades**





*"My favorite place in nature is the forest because we learn stuff like when I came here I didn't know what a salamander was."*

*West Warwick Elementary Student*



**Middle School Engineering Transportation Challenge Weekend**

*"We learned a lot about the field of bioengineering, shared a lot of laughs, a lot of food, a lot of good times, and of course.... A lot of SMILES"*

*West Warwick High School Student*



**High School Biotechnology Engineering Challenge Weekend**

## HIGHLIGHTS



**Elementary Outdoor Science Adventure**

*"I would recommend SMILE to other students because it is fun, educational and it lets you meet other kids from all around the state at the challenge weekend. Also, the potluck supper is awesome because you get to choose what you eat and drink. That's why I recommend SMILE!"*

*South Kingstown Middle School Student*

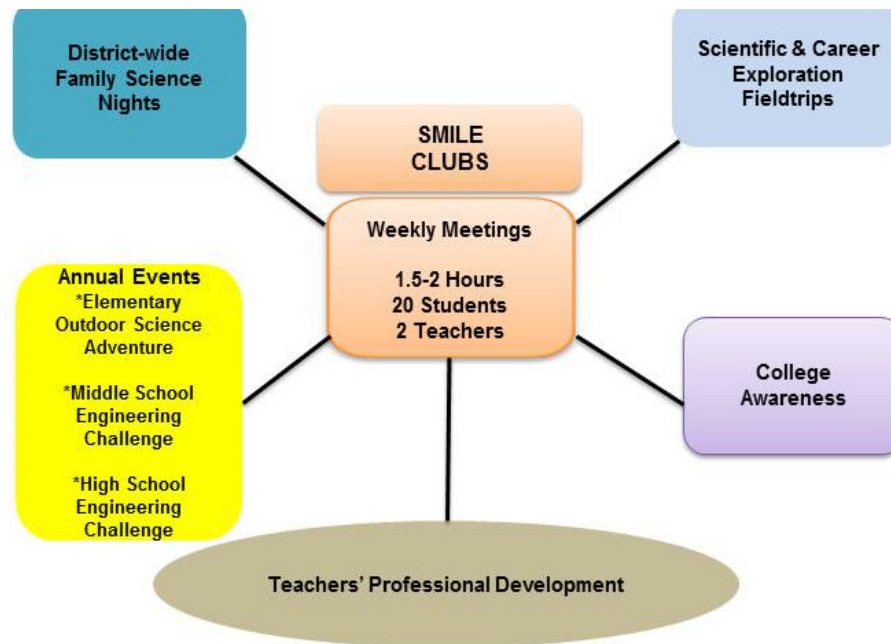
Table 2

### ANNUAL EVENTS PARTICIPATION

Program Level	Students Participating	Percent Participating
Elementary	75	90%
Middle School	76	79%
High School	69	67%

## OUR EVENTS

# Program Structure



### Teachers' Professional Development

Professional development workshops are the foundation of the program structure. SMILE provides continuous support to the club teachers through professional development workshops, networking, curriculum materials, and equipment. Workshops are conducted three times a year, are led by URI resource faculty and SMILE professional staff.

### Weekly Club Meetings

All activities and events revolve around the weekly after school club meetings that take place in each school. Club meetings last 1.5-2 hours and provide fun, integrated math and science activities in a relaxed atmosphere. In each school, the SMILE club has a year round schedule of activities that focus on:

- Hands-on and Engaging Science and Math
- Scientific and Career Exploration Field trips
- College Awareness

### District-wide Family Science Nights

These events bring together SMILE students, their families, and community members. Students demonstrate interactive science activities. SMILE personnel inform parents and students about college admissions and student financial aid. The Family Science Night is a wonderful expression of interest and support by parents and community members. Parents have the opportunity to get more involved in their children's education, and see them as competent learners. The children's self esteem soars!

### Annual Events

- Elementary Outdoor Science Adventure
- Middle School Engineering Challenge Weekend
- High School Challenge Weekend



## OUTCOMES

### **I. SMILE provides high quality program activities:**

- \*Sixteen after-school clubs
- \*Four Family Science Nights in SMILE communities
- \*Three Professional Development workshops for SMILE teachers
- \*Three Annual Events for SMILE students:
  - Elementary Outdoor Science Adventure (EOSA)
  - Middle School Engineering Challenge Weekend
  - High School Engineering Challenge Weekend

### **II. SMILE students have:**

- \*Increased social/academic connections
- \*Increased self-confidence and self-esteem
- \*Increased confidence in their science & math ability
- \*Increased college aspirations & expectations
- \*Improved academic achievement
- \*Increased college awareness opportunities
- \*Increased college admissions knowledge
- \*Developed relationships with caring adults/mentors

### **III. SMILE motivates students to do well in school and continue their education**

- \*High school SMILE students enrolled in four years of science and math plan to attend college
- \*All SMILE seniors graduated from high school and all but one have been accepted to college

### **IV. SMILE provides engaging hands on activities**

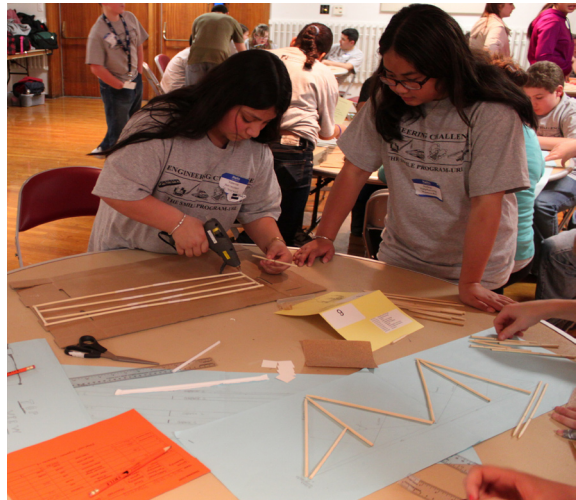
- \*This year we completed the implementation of the NOAA Learning Ocean Science Through Ocean Exploration curriculum. During the summer of 2010, SMILE teachers received training on this curriculum and the use of the Ocean Explorer Website
- \*SMILE staff presented a NOAA workshop to non-SMILE middle and high school teachers

### **V. SMILE facilitated the engagement of industry mentors, university faculty, and university students in SMILE activities**

- \*URI faculty and industry experts made presentations at the Teachers Professional Development Workshops introducing science concepts and career opportunities to bring back to students
- \*105 URI college students and faculty were mentors and educators at the SMILE annual events
- \*25 Amgen mentors participated in the Biotechnology-Engineering High School Challenge
- \*14 Schneider Electric (APC) mentors participated in the Middle School Engineering Challenge
- \*5 Toray Plastics mentors participated in the Middle School Engineering Challenge
- \*25 URI students from The National Society of Black Engineers (NSBE) served as student mentors at our Middle & High School Challenge Weekends. The NSBE students also presented four activities to all SMILE students about going to college and the different types of engineering careers
- \*Students from the URI Society of Hispanic Professional Engineers (SHPE) also participated as mentors to SMILE students at the challenge weekends
- \*URI Leadership students engaged in developing and conducting the Elementary Outdoor Science Adventure (EOSA)
- \*SMILE Staff instructed a spring-term course (PLS 492) for URI students facilitating the EOSA
- \*SMILE staff created and instructed a three credit course for SMILE teachers

### **VI. SMILE continued to expand its role as a campus partner in pre-college STEM outreach activities**

- \*Collaborated with the URI Chemistry Department, URI College of Engineering and the URI Transportation Center on various grant initiatives



## CONTINUATION RATES

In the school districts we serve, only 40% of the high school graduates will continue on to college. By having a pipeline, students can join as early as the 4th grade and continue through 12th grade, preparing to continue on to college along the way. Our goal is to increase the numbers of underrepresented, minority, and low income students well-qualified to enter higher education. 98% of SMILE high school seniors will enter college in the fall, 2011.

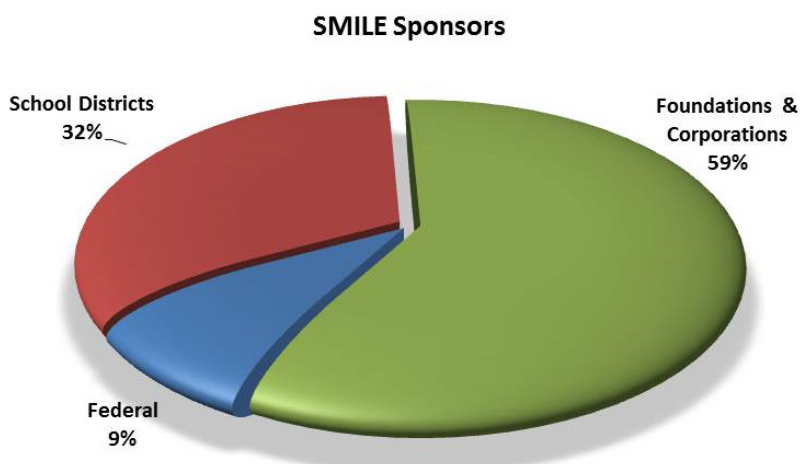
Table 3

### RETURNING STUDENTS

Program Level	Total # of Students per Level	Students Continuing 2010-2011	Percent Continuing 2010-2011
Elementary	83	17	20%
Middle School	96	54	56%
High School	103	46	45%
<b>Total</b>	<b>282</b>	<b>117</b>	<b>42%</b>

*The SMILE Program gratefully acknowledges the following organizations for their support*

## SPONSORS



Amgen Foundation  
 Amgen International Network  
 AMICA  
 Arnold Lumber  
 Eaton Aerospace Foundation  
 Dominion Foundation  
 Graphic Expressions  
 Holiday Inn, South County RI  
 Houghton Mifflin Harcourt  
 Jewish Community Fund  
 National Oceanic and Atmospheric Administration  
 Schneider Electric (APC)  
 Toray Plastics (America), Inc.

Central Falls School District  
 North Kingstown School District  
 South Kingstown School District  
 West Warwick School District  
 Woonsocket School District  
 21st Century Community Learning Center,  
 North Kingstown

University of Rhode Island  
 URI Amgen Bruce Wallace Biotechnology Lab program  
 URI Transportation Center  
 URI College of Engineering



## SUCCESS STORIES

### Jimmy Li, SMILE Graduate/URI Engineering Student

---



**SMILE  
Senior Picture  
Class  
of  
2008**

Jimmy Li joined the SMILE club in 9th grade at West Warwick High School. He enjoyed anything to do with science especially if it involved building something. He participated in four URI Environmental Engineering Challenge Weekends.

Jimmy selected the University of Rhode Island with a double major in Electrical Engineering and Chinese. Since his freshman year Jimmy has helped the URI SMILE Program during our annual challenge weekends as an undergraduate mentor. He was accepted into the International Engineering Program (IEP) and during the summer of his freshman year, participated in the intensive Chinese language course.



**Jimmy Li with his  
SMILE Club at  
West Warwick High  
School  
2008**

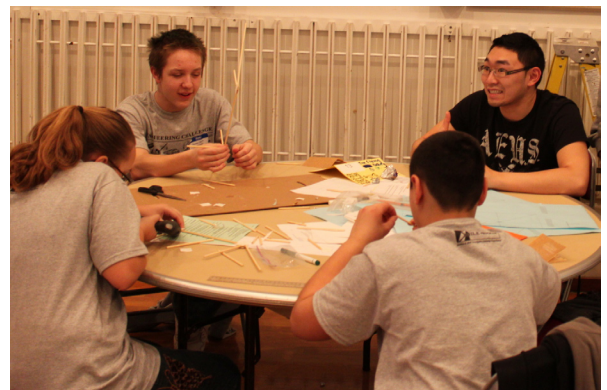
In his second year at URI, he participated in a one month summer engineering program in China and had a wonderful experience. He worked part time at Ram Computers and was very helpful installing new computers at the SMILE office.

Jimmy will spend his 4th year studying engineering and interning in China. We will miss his enthusiasm, love of learning, and expertise on campus. We look forward to emails from China and wonderful stories when he returns.



**March 2011:**

**Jimmy Li serves as a  
SMILE mentor at the  
Middle School  
Engineering  
Challenge Weekend**



### Graduate Degrees

**Thirteen** SMILE students who graduated from high school between 1998 and 2004 not only completed bachelor's degrees but continued in graduate studies. Of these, five have earned Master's degrees (two are in Education, one in Social Work, one in Museum Studies, and one student earned dual Master's degrees in Information Systems and Health Sector Management), one a Doctor of Medicine degree, and one a Juris Doctor Law degree.

## Board of Advisors

Marilyn Cohen  
North Kingstown  
Town Planner, retired

William Horan  
CPA: Horan and Golden, Inc.  
Wakefield RI

Fred Frostic  
USAF, retired

Domenic Valentino  
URI Psychology Professor, retired

Malcolm Spaulding  
URI Ocean Engineering Professor  
and ASA Inc. CEO

John Peterson  
URI New media  
Communications and Marketing

Glenda Kirby  
Home Fabrics, Inc NC and RI,  
Retired

## SMILE STAFF

Carol Englander  
Director

Augusto Gomes  
Assistant Director  
EOSA Coordinator

María-Gabriela Lizano  
Development and  
Publications  
Coordinator

Lacey Schlachter  
Program Coordinator

Catherine Valentino  
Curriculum Advisor

## URI RESOURCE FACULTY

John McCray, Jr.  
Vice Provost for Urban Affairs

Thomas Dougan,  
Vice President for Student Affairs

## ENGINEERING

Faye Boudreaux-Bartels  
Christopher Hunter  
Mercedes  
Rivero-Hudec  
Manbir Sodhi  
Malcom Spaulding

## COLLEGE OF THE ENVIRONMENT & LIFESCIENCES

Jose Amador  
CELS-NRS

Larry Englander  
CELS-Plant Science

## MATHEMATICS

Orlando Merino

## PHARMACY

Clinton Chichester

## EDUCATION

[www.uri.edu/smile](http://www.uri.edu/smile)



[www.uri.edu/smile](http://www.uri.edu/smile)

THE  
UNIVERSITY  
OF RHODE ISLAND

50 Lower College Road, Suite 305  
Kingston, RI 02881-0800

THINK BIG  WE DO™