TERC®

2011 – 2012

TERC

An Education Research and Development Organization

"We imagine a future in which learners from diverse communities engage in creative, rigorous, and reflective inquiry as an integral part of their lives."

Creating Effective Mathematics and Science Learning Environments

Frank E. Davis, *President*

At the center of our nation's capacity to address global economic conditions, climate change, public health, or international relations is our ability to teach science and mathematics with understanding. In addition to encouraging the development of new scientists, engineers, and mathematicians who come from diverse backgrounds, our educational infrastructure needs to foster a mathematically and scientifically literate citizenry capable of tackling the great challenges that will impact future prosperity, health, and happiness.

Learning science and mathematics cannot simply mean knowing a large body of facts. We must acknowledge that the enormous amount of scientific knowledge available, and its complexity, now far outstrips any individual's learning capacity. To understand and use knowledge, we must also understand the practices of scientific and mathematical inquiry and how to apply and organize that knowledge for various human purposes. This point became very tangible to me when I read an address that Dr. Atul Gawande, a noted physician and author, gave to recently graduating medical students.* He noted that they could not know all of the current 13,600 classifications of human diseases, nor the more than 6,000 medications and 4,000 medical and surgical procedures that could be used in treatment. Furthermore, breaking these down into domains of specialist care did not necessarily result in more effective medical knowledge or practice. Both doctors and their patients must understand an emerging complexity of medical science, practice, options, and costs.

For more than 45 years, TERC has focused on creating effective mathematics and science learning environments. This work not only involves staying abreast of the emerging complexity of scientific and mathematical knowledge, but also knowledge about the individual processes and social contexts of learning and teaching. We also recognize that engaging the diversity of cultural experiences within our society is essential for TERC to achieve its vision of "a future in which learners from diverse communities engage in creative, rigorous, and reflective inquiry as an integral part of their lives."

TERC remains committed to working within communities of practice by collaborating with educators, researchers, scientists, and mathematicians to improve education. The scope of our research initiatives continues to broaden and deepen. With more than 64 active projects, TERC is partnering with schools, colleges and universities, research institutions, museums, afterschool programs, public agencies, and private foundations to conduct research on learning and teaching, develop curricula and professional development programs, enhance instruction through the use of new technology, and evaluate the impact of programs and practices. At a time when our educational infrastructure is coping with competing pressures and limited resources, TERC will continue to ask and study the critical and complex questions that can lead to advancements in the teaching and learning of science and mathematics.

* 2010 commencement speech at Stanford University Medical School
http://www.newyorker.com/online/blogs/newsdesk/2010/06/gawande-stanford-speech.html

About TERC

For more than forty years, TERC has been introducing millions of students throughout the United States to the exciting and rewarding worlds of math and science learning. Led by a group of experienced, forward-thinking math and science professionals, TERC is an independent, research-based organization dedicated to engaging and inspiring all students through stimulating curricula and programs designed to develop the knowledge and skills they need to ask questions, solve problems, and expand their opportunities.

Mission

TERC's mission is to improve mathematics and science education. TERC works at the frontiers of theory and practice to contribute to a deeper understanding of learning and teaching; enhance instruction through professional development; develop applications of new technologies to education; create curricula and other products; and support reform in both school and informal settings.

Vision

TERC imagines a future in which learners from diverse communities engage in creative, rigorous, and reflective inquiry as an integral part of their lives — a future where teachers and students alike are members of vibrant communities where questioning, problem solving, and experimentation are commonplace. This vision is grounded in the belief that science and math literacies are critical to strengthening and preserving a democratic society.

History

In 1965, Arthur Nelson and a small group of co-founders established the Technical Education Research Centers. Nelson, a lawyer and businessman with a background in physics, had worked at MIT during the Second World War on the team that invented high frequency radar. He and his associates shared a vision of a not-for-profit research center to develop high quality instructional materials for training a new population of specialized technicians.

During its early years, TERC focused on various aspects of technical and occupational education, primarily at the postsecondary level. At that time, many of the philosophical underpinnings that guide TERC today were put firmly in place: dedication to public service; determination to make its programs accessible to all; emphasis on working with teachers in actual classroom and lab settings; and confidence in the educational power of hands-on experience.

In the early 1970s, TERC successfully initiated a series of projects that marked a transition from postsecondary technical education to K-12 science education with a heightened emphasis on advanced technology. These resulted in the design of science-based curriculum modules with explicit hands-on content. TERC also began studying ways of accommodating students with physical disabilities in secondary schools and community colleges, which led to enduring commitments in the areas of special needs and access, as well as deep expertise in research and evaluation.

Today we are known as TERC. This change embraces the development of our education initiatives through the years and the learners we serve, including those in K-12 classrooms, museums, afterschool programs, community colleges, adult education centers, universities and, other research institutions.

Organizational Structure

Currently, TERC's staff of 113—including nationally recognized leaders in educational research and curriculum development—are actively engaged in 78 projects. Sixty-seven percent of staff have advanced degrees in science, mathematics, engineering, education, psychology, and technology. In 2011, TERC had 15.8 million in revenue. Each year, TERC's products and services reach more than 3.5 million students throughout the United States.

TERC's research and development projects are housed within two centers — the Center for School Reform and the Center for Science Teaching and Learning — and the Education Research Collaborative division.

The Center for School Reform (CSR)

CSR encompasses multiple bodies of work all aimed at improving math and science education for all students. The work of the center is diverse in that it encompasses research, professional development, direct service, curriculum development, electronic network creation, and evaluation. Projects within the center span elementary, middle, high-school, college and graduate education. While some of the projects are engaged in large-scale, national, systemic change efforts, others are local, researching and providing direct service to classrooms in Massachusetts. Bodies of work in the center include: creating, facilitating

PROJECT HIGHLIGHTS

Accessing Science Ideas (ASI)

Developing and researching content enhancements to accompany two Full Option Science System (FOSS) curriculum units that support science learning of middle school students with executive function learning disabilities. Funder: National Science Foundation (DRL-0822039)

The Atlantic Partnership for the Biological Sciences

Salem State College, Universidad de Puerto Rico en Humacao, TERC, and school districts from Massachusetts and Puerto Rico are working together to transform the way life sciences are taught in the two colleges and up to 17 multicultural school districts. Funder: National Science Foundation (DUE-0928417)

Partners: Salem State College, Universidad de Puerto Rico en Humacao, Puerto Rico Department of Education, Salem Public Schools (Salem, MA)

Biocomplexity-Transforming Innovative High School Curriculum

Developing multimedia scaffolding materials to accompany the TERC-developed Biocomplexity and the Habitable Planet curriculum. Funder: National Science Foundation (DRL-1020089)

Partner: Center for Applied Special Technology (CAST)

Contribution of Science Fair to Middle School Student Interest in Science Careers

Exploring the effects of participation in the Massachusetts State Science and Engineering Fair on middle school students' interest in, self-efficacy, and future plans in science. Funder: The Noyce Foundation

and researching cutting edge, online learning communities and collegial networks; researching technology integration in the science classroom; curriculum development, professional development and research projects focused on biology, bio-complexity and ecology; research and professional development aimed at improving the experience of learning-disabled students in the science classroom; informal science education related to energy conservation; and external evaluation of science, technology, engineering, and mathematics projects. CSR has 13 active projects. The following are selected highlights.

Girls' Energy Conservation Corps (GECCo)

This innovative, new media-based after-school project engages girls ages 8-11 in energy conservation activities. Funder: National Science Foundation (DRL-0813434)

Partners: Girl Scouts of Eastern Massachusetts, 360KID.

IGERT Resource Center

Facilitating the comprehensive resource center and collegial network for NSF's IGERT (Integrative Graduate Education and Research Traineeship) programs across the country to share research, resources, and discoveries with each other and the public at large. Funder: National Science Foundation (DGE-0834992)

Partners: Over 150 IGERT projects nationwide

MSPnet: The Math and Science Partnership Network

Facilitating communication and collaboration between and within the Math and Science Partnership projects through a customized web-based platform. Funder: National Science Foundation (DUE-0634149)

Partners: Over 100 MSP projects nationwide

Researching the Wireless High School

Examining science teaching in six pioneering wireless high school science classrooms. Funder: National Science Foundation (DRL-0455795)

Partners: Six high schools in Massachusetts

Under the Microscope

Examining the research base on biological lab experiences across grades 1-13. Funder: National Science Foundation (DRL-0815190)

CSR STAFF

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The Center for Science Teaching and Learning (CSTL)

The Center for Science Teaching and Learning (CSTL) is a research and development center for K-12 science education in formal and informal learning environments. CSTL conducts research; develops technology-enhanced curriculum and professional development; researches and develops web-based and mobile assistive technologies for individuals with disabilities; researches and designs educational gaming environments; fosters collaborations among students, teachers, and scientists across the world; and promotes

PROJECT HIGHLIGHTS

CLEAN Pathway

Bolstering climate literacy through a comprehensive set of climate science resources for students grades 6-16 and beyond. Funder: National Science Foundation (DRL-0938051)

Partners: The National Oceanic and Atmospheric Administration (NOAA), the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, the Science Education Resource Center (SERC) at Carleton College, and the National Renewable Energy Laboratory (NREL)

Collaborative Research: Confronting the Challenges of Climate Literacy

Developing a capstone, standards-aligned climate science curriculum and professional development model for high school students and their teachers. Funder: National Science Foundation (DRL-1019721)

Partners: Districts in Texas and Mississippi; Mississippi State University; Michigan State University; University of Texas-Austin Institute of Geophysics; SERC, Carleton College; CIRES, University of Colorado

Eyes in the Sky II: Facilitating Classroom Research Using NASA Resources and Geospatial Technology

Introducing high school science teachers to the latest geospatial analysis and visualization tools. Funder: National Aeronautics and Space Administration.

The Handheld Signing Math & Science Dictionaries for Deaf or Hard of Hearing Museum Visitors Research Project

Studying the integration of iPod Touch versions of the Signing Science Pictionary, Signing Science Dictionary, and Signing Math Dictionary into a selection of exhibits at the Museum of Science, Boston. Funder: National Science Foundation (DRL-1008546)

Partners: Museum of Science, Boston; Vcom3D

Kids' Survey Network (KSN)

Pioneering a new model of web-based informal learning through an "apprenticeship network" in which teams of young people develop survey studies on topics that matter to them. Funder: National Science Foundation (DRL-0741601)

Partners: Citizen Schools, Boston, MA; Barnstable Public Schools-ZOOM program, Hyannis, MA; Go-Girls at Wayne State University; Go-Girls at Saint Joseph's College; Girls Inc., Nashua, NH

policy reform. CSTL hosts the Climate Literacy Network; EdGE (Educational Gaming Environments) group at TERC; and the series of Signing Math and Science initiatives. CSTL has 26 active projects. The following are selected highlights.

The Poincaré Institute for Mathematics Education

Developing programming and pedagogy to improve the teaching and learning of middle school mathematics. Funder: Tufts University through a grant from the National Science Foundation (DUE-0962863)

Partners: Tufts University; Nine school districts in Massachusetts, New Hampshire, and Maine

Rethinking How to Teach Energy: Laying the Foundations in Elementary School

Exploratory research to identify a network and sequence of ideas in a learning progression for energy for grades 3-5 that builds a foundation for students to understand science in middle school and beyond. Funder: National Science Foundation (DRL-1020013)

Signing High School Science

Using the SigningAvatar® accessibility software to produce a set of learning tools that will increase access of high school students who are deaf or hard of hearing to educational content in life science and physical science. Funder: National Science Foundation (DRL-1019542)

Partner: Vcom3D

Talk Science

Developing and studying web-based professional development to help elementary science teachers engage their students in academically-productive classroom talk. Funder: National Science Foundation (DRL-0918435)

Partners: Clark University, Tufts University, Education Development Center

Targeted Research for a Serious Games NSDL Pathway

Designing and testing an environmental crisis game for the virtual world Blue Mars that disseminates NSDL-aligned resources. Funder: National Science Foundation (DUE-1043357)

Partners: Virtual Space Entertainment, Institute for Learning Innovation (ILI)

CSTL STAFF

Harold McWilliams
(Chair, Executive Committee)
Jodi Asbell-Clarke, Sue Doubler and Tamara Ledley
(Executive Committee)

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Education Research Collaborative (ERC)

The Education Research Collaborative (ERC) is devoted to research on math and science learning and the research-based development of curricula, learning tools, and staff development models. Major areas of work include elementary mathematics; research on language, culture and science learning; adult numeracy; math learning out of school; and statistical reasoning and data analysis. ERC houses the Adult Numeracy Center, the Chèche Konnen Center, the Mixing in Math series of initiatives, and the Investigations Implementation and Workshops group. ERC has 25 active projects. The following are selected highlights.

PROJECT HIGHLIGHTS

Beyond the Double Bind: Women of Color in Science, Technology, Engineering, and Mathematics

The study identifies gaps in our understanding, and identifies some of the methodological problems associated with answering outstanding questions about the double bind faced by women in STEM fields. Funder: National Science Foundation (DRL-0909762)

Cultural Context of Learning: Native American Science Education

This project tests the effectiveness of an approach which builds upon the intellectual resources rural Menominee and urban inter-tribal children develop in their everyday lives to develop critical academic literacies.

Partners: Northwestern University, the Menominee Tribal School (MTS) and the American Indian Center of Chicago (AIC)

Evaluating DMI

Researching the efficacy of the Developing Mathematical Ideas (DMI) Teacher Professional Development Program. Funder: National Science Foundation (DRL-1019769)

INK-12: Teaching and Learning Using Interactive Inscriptions in K-12

Investigating how pen-based wireless tablet computing can support and transform classroom practices that are known to enhance student learning in STEM disciplines and developing software to support this technology. Funder: National Science Foundation (DRL-1019841)

Math Off the Shelf

Developing games and activities to make math a fun, visible part of public library programming for elementary children and their families. Funder: National Science Foundation (DRL-0714537)

Partners: Public library networks in New York; Connecticut; California; and other states and regions

New York City Professional Development for Adult Educators

Building on TERC's EmPower Curriculum and workshops and providing ongoing professional development opportunities for math educators in the NYC adult education system. Funder: NYC Department of Education

A Practice-Based Approach to Professional Development in Science in Urban Elementary and Middle Schools

The Chèche Konnen Center at TERC is collaborating with the Boston Teacher Residency of the Boston Public Schools, and two partner public K-8 schools in Boston to design, develop, and evaluate a practice-based inquiry approach to professional development that prepares teachers to move K-8 science teaching toward more rigorous, engaged and equitable learning for their students. Funder: U.S. Department of Education

Partner: Boston Teacher Residency - Boston Public Schools

Statistics for Action (SFA)

Working with environmental action groups to advance the quantitative literacy skills of adults involved in local advocacy. Funder: National Science Foundation (DRL-0812954)

Partners: Toxics Action Center of New England, the Pesticide Watch Education Fund, the Blue Ridge Environmental Defense League, the New England Literacy Resource Center, Operation Green Leaves, the Little Village Environmental Justice Organization

Using Routines As An Instructional Tool for Developing Students' Conceptions of Proof

Developing and investigating an instructional model for teaching the concept of mathematical proof in grades 2-5. Funder: National Science Foundation (DRL-1019482)

ERC STAFF

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TERC Statements of Financial Postion

For the Year Ended December 31, 2011 with Comparative Totals for 2010

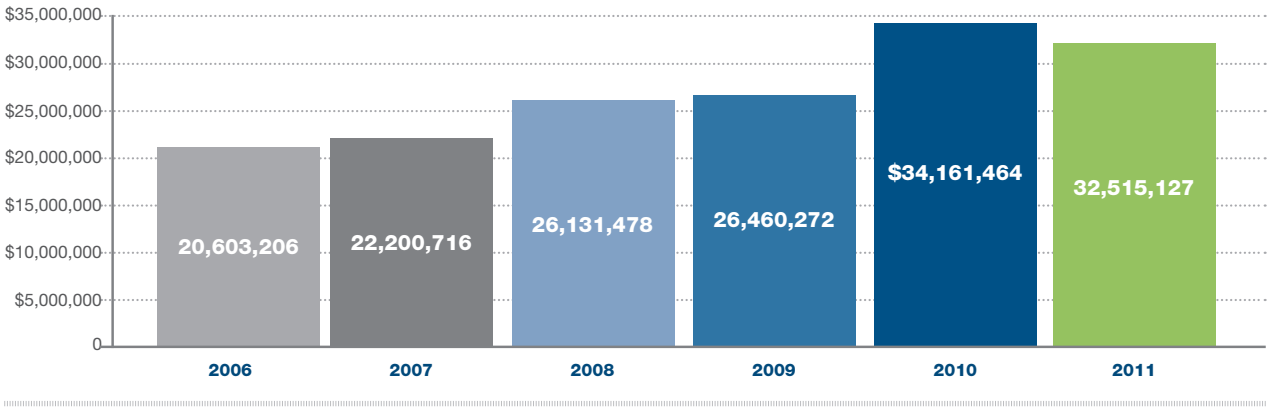
	2011	2010
Assets		
Current Assets:		
Cash and cash equivalents	$ 2,360,535	$ 2,510,372
Accounts receivable	2,934,454	2,592,780
Prepaid expenses and other current assets	229,133	225,367
Total current assets	**5,524,122**	**5,328,519**
Investments	13,205,781	12,970,523
Property and Equipment, net	463,226	759,548
Deposit	35,611	35,611
TOTAL ASSETS	**$ 19,228,740**	**$ 19,094,201**
Liabilities and Net Assets		
Current Liabilities:		
Accounts payable	$ 767,669	$ 584,411
Accrued expenses and other current liabilities	1,118,279	1,157,530
Deferred contract revenue	49,856	55,138
Total current liabilities	**1,935,804**	**1,797,079**
Net Assets:		
Unrestricted	17,260,398	17,202,958
Temporarily restricted	32,538	94,164
Total net assets	**17,292,936**	**17,297,122**
TOTAL LIABILITIES AND NET ASSETS	**$ 19,228,740**	**$ 19,094,201**

TERC Statements of Activities

For the Year Ended December 31, 2011 with Summarized Comparative Totals for 2010

	Unrestricted	Temporarily Restricted	TOTAL 2011	TOTAL 2010
Revenue and Support				
Grant and contract revenue	$ 11,490,128	–	$ 11,490,128	$ 10,818,172
Foundation grants and contributions	–	41,297	41,297	$ 77,007
Royalty income	3,234,874	–	3,234,874	3,384,457
Workshop income	958,289	–	958,289	1,017,345
Other	83,122	–	83,122	31,454
Net assets released from restrictions:	102,923	(102,923)		
Total revenue and support	**15,896,336**	**(61,626)**	**15,834,710**	**15,328,435**
Expenses				
Education research	12,885,499	–	12,885,499	12,476,953
Management and general	3,107,299	–	3,107,299	3,162,407
Fundraising	138,109	–	138,109	94,036
Total expenses	**16,130,907**	**–**	**16,130,907**	**15,733,396**
Operating Income (loss)	**(234,571)**	**(61,626)**	**(296,197)**	**(404,961)**
Non-Operating Revenues				
Interest and dividends	371,371	–	371,371	375,524
Unrealized gains (losses) on investments	(25,879)	–	(25,879)	835,755
Realized gains (losses) on investments	27,692	–	27,692	(18,163)
Investment fees	(81,173)		(81,173)	(74,686)
Total non-operating revenues	**292,011**	–	**292,011**	**1,118,430**
Change in net assets	**57,440**	**(61,626)**	**(4,186)**	**713,469**
Net assets, beginning of year	17,202,958	94,164	17,297,122	16,583,653
NET ASSETS, END OF YEAR	**$ 17,260,398**	**$ 32,538**	**$ 17,292,936**	**$ 17,297,122**

Total Grant Backlog



Professional Development Institutes and Workshops

Adult Numeracy Center
adultnumeracy.terc.edu

The center offers multi-day intensive sessions for adult numeracy teachers interested in maximizing the quality of mathematics instruction for adults and out-of-school youth.

Investigations Workshops
investigations-workshops.terc.edu

TERC offers a variety of professional development opportunities for teachers, math specialists, and principals to support the implementation of the K-5, ***Investigations in Number, Data and Space***® curriculum.

Using Data
usingdata.terc.edu

TERC's Using Data professional development process helps educators at all levels understand and use data to improve teaching and learning. The program is customized to address a district's own data and works with any data system already in place. Districts can choose on-site or online delivery of the Using Data training.

Evaluation Group @TERC
evaluation.terc.edu

TERC's Evaluation Group builds on its members' collective research strengths in mathematics, science, engineering, and technology to provide responsive and rigorous evaluations for a variety of clients. The Evaluation Group offers consultation and evaluations for organizations with existing grants and programs, and collaborates with proposal writing teams to design evaluations.

Resources by TERC

Years of research go into TERC's products—innovative classroom materials for students, cutting-edge research and professional development publications, web-based resources that enrich traditional materials, games and software for out-of-school learners, and web-based and mobile assistive technologies for individuals with disabilities.

For a complete list of materials developed by TERC visit **www.terc.edu**.

The following are just a few of the resources developed by TERC and available from publishers.

Investigations in Number, Data, and Space®
K-5 mathematics curriculum (Pearson)

Astrobiology: An Integrated Science Approach
High school science curriculum (It's About Time)

Investigating Astronomy
High school science curriculum (It's About Time)

My Kids Can: Making Math Accessible to All Learners, K-5
Professional development book (Heinemann)

Teaching Science to English Language Learners
Professional development book (NSTA Press)

The Signing Science Dictionary
CD-ROM (VCom3D)

TERC ADMINISTRATION

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